METROPOLITAN ASYLUMS BOARD.

REPORT

ON THE

BACTERIOLOGICAL DIAGNOSIS

AND THE

Antitoxic Serum Treatment

OF

CASES ADMITTED TO THE HOSPITALS OF THE BOARD

DURING THE YEARS 1895 AND 1896.

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INTRODUCTION.

The following summary may be useful in enabling those who wish to study special parts, only, of the Report to obtain an idea of the remainder without going through the whole.

Period over which report extends.

The Report deals exclusively with the cases that were examined bacteriologically during the period between January 1st, 1895, and December 31st, 1896.

For three months direct microscopic examination of the material taken from the "swabs," as well as from cultivations, was made. Subsequently, and to the end of the period, cultivations were made, and microscopical examination of the separate colonies was carried out.

Overlapping years.

Owing to overlapping, and in order to bring as many completed cases as possible within the scope of the Report, every completed case of which an examination was made during this period has been included, with the result that a few cases appear as having been admitted to hospital during the year 1894, and specimens from cases which were not discharged until the early months of 1897 are included because they were examined in 1896.

Cultivations examined.

Failure to diagnose in 5 per cent. of cases examined.

During this period 27,128 cultivations were examined; of these 24,933 could be traced and assigned to 12,172 patients (see p. 10). Of these cases 73·42 per cent. gave evidence of the presence of diphtheria bacilli; in 5 per cent. of the whole it may be concluded that bacteriological examination failed to assist in the diagnosis of diphtheria.

Of the 8,937 cases in which diphtheria bacilli were found, 4,052 were discharged from hospital before the disappearance of diphtheria bacilli from the throat had been proved, whilst in 4,885 cases at least one examination had been made without the presence of the diphtheria bacillus being demonstrated; in 607 cases bacilli were not found at the first examination, although they were subsequently demonstrated; and in 3,086 cases no second examination was made.

Persistence of diphtheria bacilli in throat.

On p. 16 will be found the periods over which the diphtheria bacilli persisted. In one or two cases the specimens taken from the throat contained diphtheria bacilli six months after they had been first demonstrated. This persistence of the diphtheria bacillus for periods up to eight weeks is a marked feature in the bacteriology of the disease. In two cases the bacillus was found to persist at the end of 200 days, and in 79 cases it persisted beyond 100 days.

Activity of diphtheria bacilli.

Mixed infections.

Where diphtheria bacilli only are found the long bacillus appears to be the most active agent in the production of the disease. Mixed infections are always more fatal than are simple diphtheria intoxications. Contrary to what is usually stated, it was found that the staphylococcus reinforcing the diphtheria bacillus appeared to be associated with a more fatal form of the disease than when a mixture of a streptococcus and the diphtheria bacillus was found. This feature is most marked in the case of the shorter and irregular forms of the diphtheria bacillus, and where the long bacilli are absent. Here the mixed infections are much more fatal than are the simple diphtheria infections, where the short and irregular bacilli alone are present.

The reduction in the mortality of scarlet fever cases in which diphtheria complications occur has been very marked where antitoxin has been used—greatly, no doubt, because of the early period at which the antitoxin is usually administered in these cases. In scarlet fever cases the streptococcal complication is more common and apparently more fatal than in ordinary cases of diphtheria.

"Negative" cases.

No diphtheria bacilli could be found in the swabs taken from 3,235 of the cases that were sent into hospital certified as suffering from diphtheria, and so far resembling true diphtheria, clinically, that they were admitted. It should be noted that the death rate amongst these cases is very low (see p. 22).

It will be found on reference to pp. 24-27 that the diphtheria mortality varied very greatly at different hospitals, being as high as 27·07 per cent. at the North-Western Hospital, and as low as 0·0 at the Gore Farm Hospital.

Age incidence of mortality.

The highest percentage mortality appears to be between the first and second years of life, then in the first year, and after that it falls off regularly up to the end of the fifth year, and then more rapidly up to 20 years and upwards.

The case mortality under different conditions is discussed on pp. 35 and 36.

Of the 2,503 cases under five years of age in which diphtheria bacilli were found, only 31·52 per cent. died as against 47·4 per cent. in the pre-antitoxin period.

Influence of area affected.

Effect of antitoxin.

As regards the percentage mortality where different parts are affected, some interesting facts come out. In 1895 where the fauces alone are affected, the percentage death rate is 12·1; where the fauces and nares are affected 39·5; fauces and larynx 37·3; the larynx only 30·7; and when the fauces, larynx, and nares are all affected 62·2 per cent.; the extent and position of the membrane then playing a very important part in determining the severity of the disease. In 1896, when the antitoxin had undoubtedly improved and the method of treatment was better understood, there was, as seen on p. 37, a considerable fall in the percentage mortality, especially amongst those cases that must be looked upon as of the more severe type. Amongst the purely laryngeal cases, however, there is a slight rise on a small number of cases.

Where antitoxin was not given in the m[illegible] severe cases—that is, where the larynx and nares were affected—the percentage mortality was v[illegible] high—82·6 in 1895 and 64·2 per cent. in 1896; it was also very high amongst the laryngeal ca[illegible]—over 70 per cent.

Antitoxin and tracheotomy cases.

Amongst the 3,042 cases in the pre-antitoxin year 1894 (p. 41), there were 261 tracheotomies with 184 deaths, a mortality of 70·4 per cent. of the cases operated upon. In 1896, when antitoxin was more used, there were only 246 tracheotomies amongst 5,068 cases; of these, only 104 died, or 41·46 per cent., as compared with 70·4 per cent. in 1894. Had tracheotomy been necessary in the same proportion of cases in 1896 as in 1894, there would have been 467·7 instead of 246; and with the same percentage death-rate, 329·7 instead of 104; the saving of life, then, in one year on tracheotomy cases alone amounting on this calculation to 225.

Antitoxin does not increase serious complications.

The free use of antitoxin does not raise the percentage of cases of albuminuria. As regards vomiting, the statistics give little information, as vomiting is usually met with only in the very severe cases. This also holds good of anuria. The number of cases of adenitis appears to be distinctly reduced by the use of antitoxin, as the percentage of cases falls as the injections of antitoxin are pushed. The use of antitoxin has also had a perceptible effect in diminishing the cases of nephritis, and it certainly has not aggravated the kidney complications of diphtheria. There can be no doubt that in cases treated with antitoxin there is a greater percentage of cases in which joint pains occur than in cases not so treated; these, however, are transitory, and are probably the result of some slight change in the blood set up by the action of the serum itself, and not by the antitoxic substance in the serum. The number of primary abscesses has undoubtedly been reduced by the use of antitoxin. It may also be accepted that antitoxic serum has some effect in temporarily raising the temperature, but only during the periods of joint pains and serum rashes; all these, however, are of comparatively slight importance as compared with the effect the antitoxin has in diminishing the percentage mortality and alleviating the more severe symptoms.

Cases moribund on admission.

Interesting figures in connection with the cases moribund on admission will be found on pp. 45 and 46.

It is of importance to observe that amongst the cases of paralysis following diphtheria the death rate (32 per cent.) was actually higher amongst those not injected with antitoxin than amongst those where antitoxin was used (30·5 per cent.), although the former paralyses must be looked upon as being the result of a comparatively mild attack of the disease. From this it is evident that, when once paralysis supervenes in these cases, it is quite as fatal in its effects as in the cases (usually those of a more severe type) where antitoxin has been given. Antitoxin *cannot cure* the degeneration of the nerve, but it *can neutralise* the diphtheria toxin, and so put a stop to the advance of the degenerative changes due to its action. In 1896, when, of course, antitoxin was given much more freely, the percentage of deaths in the non-injected cases where paralysis had come on fell to 18·4.

Convalescent cases.

In certain cases it was found necessary to inject antitoxin because of recrudescence of the disease. An account of these cases will be found on p. 49 (Table XLIV.).

Hæmorrhagic diphtheria.

Hæmorrhagic diphtheria is almost invariably fatal, only three cases out of 181 recovering; in all of these three antitoxin was injected. No uninjected case of hæmorrhagic diphtheria recovered.

Rashes.

Antitoxin rashes occur at a comparatively late stage of the disease. They cannot be looked upon as in any way dangerous, although the secondary rise of temperature and the irritation of the skin which usually accompany their presence are very undesirable complications, and may retard somewhat the convalescence of nervous and irritable patients.

Pneumonia.

Antitoxin appears to diminish the liability of the lungs to inflammatory change in severe attacks of diphtheria.

Bacteriological examination at fault in a few cases.

It is evident from a reference to Table LIX. (p. 58) that the diphtheria bacillus was overlooked in a certain proportion of cases, the clinical evidence in such cases being so strong that the physician in charge of the patient deemed it advisable to inject antitoxin. Amongst 752 such cases the death rate was 20·07 per cent., and of those under five years of age 31·5 per cent. In this Table a most important fact is brought out: of such patients injected on the first day—58 in number—only one died, a percentage mortality of 1·7.

Percentage mortality amongst cases in which diphtheria bacilli could not be found.

Taking the whole of the cases that were bacteriologically examined but in which no diphtheria bacilli were found—3,235 in all—the percentage mortality is 10·7; whilst of those treated on the first day, with and without antitoxin, 3·3 per cent. died, or, subtracting the antitoxin cases from these, there were 182 with seven deaths, or 3·8 per cent. Here, then, we have evidence, first, of the efficacy of the antitoxin when given at an early stage of the disease; and secondly, of the fact that a certain proportion of true diphtheria cases gave negative bacteriological results, especially in young children. Of course, it must be borne in mind that some of these cases came in moribund, and that it would be exceedingly difficult to get satisfactory "swabs."

Difficulty of obtaining satisfactory swabs in children and in laryngeal cases.

In this group there are two classes of cases which stand out as being specially fatal in character, and which were probably cases of true diphtheria although no bacilli could be found. These are: (1) the cases, comparatively few in number, in which young children were affected and where the opportunities of obtaining good "swabs" were certainly fewer and more restricted than in the case of adults; (2) laryngeal cases where this difficulty, owing to the position of the membrane, was also necessarily marked. These cases, though few in number, play an important part in determining the percentage mortality. Amongst the children under one year in this class the death rate was 54·1 per cent. in faucial cases, and 60·0 per cent. in laryngeal cases, a much higher death rate than amongst those in which antitoxin was given; the death rate in this class continues high until the end of the fourth year.

In 1896, when antitoxin was more freely used, the death rate fell somewhat, the fall being especially well marked in cases under one year of age. That this is the result of the use of antitoxin is shown by the fact that although there is a rise in the mortality amongst the cases as a whole (treated with and without antitoxin), especially in the second and third years, there is a marked fall in both first and second years in those cases treated with antitoxin. The average time in hospital in this class of case, too, is considerably increased—from 48·05 in 1895 to 63·7 in 1896. This appears to indicate, in the first place, that a larger number of severe cases recovered, it being more necessary to keep such cases under observation for a lengthened period; and in the second, that care was exercised to detain patients in hospital until the bacilli had disappeared from the throat.

Of the injected cases, the average stay in hospital was almost exactly the same; whilst of cases that died, the average period in hospital rose from 12·09 in 1895 to 16·4 in 1896.

Amongst the uninjected laryngeal cases in which tracheotomy was performed but in which no diphtheria bacilli could be demonstrated, there was, as might be expected, an increase in the percentage mortality from 33·3 to 42·8, whilst among the injected cases there was a fall from 53·8 to 33·3. Tracheotomy cases.

As regards complications, very much the same points come out in connection with the cases in which no diphtheria bacilli could be demonstrated as in those in which bacilli were found, keeping in mind the fact that a certain proportion of these cases were undoubtedly cases of true diphtheria. Complication.

Regarding the paralysis in this group of cases, a more careful watch has during the last year or two been kept for the appearance of comparatively slight indications of this condition. As bearing on this point, it may be noticed that of 28 cases in which the vagus was affected, only five proved fatal, a very much smaller proportion than in other records, and it is obvious that much slighter evidence of nerve and muscle change is now accepted and recorded as paralytic than was formerly the case. "It remains to be seen whether there will be any further rise in the numbers of this type of case, or whether the antitoxic treatment, when carried out early, will so far prevent the occurrence of these paralyses that there will be an actual fall in the number, in spite of the fact that a certain proportion of cases treated in the later stages of disease will recover and must later show paralytic symptoms of various kinds."

Tables LXXXVIII—CVIII give the results of the use of large and small quantities of antitoxin administered at earlier and later stages of the disease. A careful study of the results obtained invariably shows that the larger the quantity of antitoxin given during the earlier stages of the disease the lower is the death rate, whilst the larger the number of cases that come under treatment in the later stages, however large be the quantity of antitoxin given, the higher is the percentage mortality resulting from the addition of these cases.

The second part of the Report is devoted to an account of the preparation of diphtheria antitoxin. Preparation of diphtheria antitoxin.

On p. 97 a short abstract of the negotiations between the Metropolitan Asylums Board and the Laboratory Committee of the Royal Colleges of Physicians (Lond.) and Surgeons (Eng.), and of the offer of the Honourable Goldsmiths' Company, is drawn up; and from pp. 98–101 is given a description of the horses and of the conditions under which they were treated.

On pp. 102-109 is described the method of preparation of diphtheria toxins.

In all the earlier work carried on it was assumed that the action of the antitoxin being specific, it was necessary to obtain a specific toxin of an active character. In the later stages of treatment, owing to the fact that a very definite immunity, not always running parallel with but sometimes even markedly ahead of the power of producing antitoxin, was set up, the use of a toxin of very great activity became essential.

From pp. 110–112 Dr. Cartwright Wood's more rapid and safer method of producing antitoxin is described. Rapid method.

The technique employed in injecting the horses, collecting the blood, separating and distributing the serum, are given on pp. 112–123.

The treatment of the individual horses, with the results obtained, are given on pp. 124–146.

Then, on pp. 147–160, are given the principles and methods of testing the potency of anti-diphtherial or diphtherial antitoxic serum, and, in tabular form, the amount of antitoxin supplied to the hospitals under the management of the Board. Testing and use of antitoxin.

In the Appendix, pp. 161–271, are given in tabular form the details from which the collective tables in the earlier part of the Report are compiled.

In connection with this part of the work I may mention that in 1889, when working with Dr. Cartwright Wood at the antidotal and bactericidal effects of pyocyanins and certain other bacterial and chemical substances, we were able by stimulating the connective tissue cells of the body to produce a condition of immunity against certain diseases. This condition of immunity, at first temporary, gradually became more lasting, and we found that, when once it had been set up, it could, up to a certain point, be comparatively easily intensified. We described the condition as one in which special activities of the cell were drawn out, and compared the cell to a body having many facets, each one of which was enabled to withstand the attacks of poisons that it had been trained to resist. Special activities of cells. Cartwright Wood had already pointed out, in his paper on "Separable Enzymes," that the poisons of micro-organisms might be looked upon as "separable functions" or substances having the power of carrying on the functions of the cell, which could overflow and pass into solution and act outside the cell. Bouchard had at this time also suggested that not only connective tissue cells but other cells of the body are constantly secreting substances which have the power of neutralising the toxic waste products of the body, though it was left to Behring to demonstrate that the introduction of certain toxic substances into the blood is rapidly followed by the appearance in the blood of substances which have the power of neutralising the toxins. Behring's observations. Although various theories have been advanced as to the mode of production of these anti-bodies, there is now a general consensus of opinion that they are the result of a special stimulation of cells, especially of the connective tissue cells, by special toxins, and that there is an extraordinary development of the special resisting function of the cell which may go on to such an extent that the anti-body overflows into the fluids in which the cell is bathed, just as the special toxins and enzymes overflow into the fluids around the toxin-producing bacteria, or the enzyme-producing yeasts. There now seems to be nothing extraordinary in this except as regards the specific interaction, for, as Bütschli and his school have pointed out in connection with the structure of the protoplasm of the cell, we must look upon these special substances as being formed by the cells, and as in some cases remaining in a loose form of combination but in others thrown out beyond the bounds of the protoplasm itself; whether the toxin be in the organism itself or outside, and whether the antitoxin be within the resisting cells or outside their protoplasm, the anti-bodies appear to act and react, one upon the other, very directly.

At this point it was naturally suggested by workers in this field—Fischer, Weigert, and Ehrlich especially—that, as so many different antitoxins could be formed in response to the stimulation of the different toxins, there must be some very special affinity between the specific toxin, say, and certain special cells or even special parts of the protoplasm of these cells. Ehrlich insists that it is only when a substance can be taken into or bound to the cell, and combined with some element in that cell, that any immunity against pathogenetic substances can be gained by the cell. This is a most interesting statement, as its acceptance involves the theory that a toxin must be assimilated by the cell before an antitoxin can be produced; consequently, the whole question of antitoxin production must be closely bound up with the processes of nutrition. As the result of the assimilation of the proteid toxin we have the production and overflow of antitoxic substances from the specially stimulated cell, but the production of immunity against disease or the secretion of antitoxin appears to be only a side issue, as it were, or rather part of a general process going on where albuminoid substances are being assimilated by living protoplasmic cells. Ehrlich maintains that "from the standpoint of immunity the toxic action of a toxin is a matter of accident, indeed of indifference, since a toxin does not produce its antitoxin by virtue of its toxic power, but because, being introduced into the animal body in such a way that its immediate destruction is avoided, it is assimilated." To put it more bluntly, the cells of our body are able to acquire immunity against organic toxic substances only because they are capable, in the process of nutrition, of taking these proteid toxic bodies into combination. Indeed, it has recently been demonstrated by Myers, Ehrlich, and others, that specific proteid substances obtained from different sources are, if introduced into the body in such a manner that they are not broken up or destroyed, capable of producing in the serum of the animal certain anti-bodies. One of Myers' experiments will serve as an example; he introduced crystallised egg albumen into the peritoneal cavity of a rabbit. After this had been repeated weekly for a period of some six or eight weeks, a small quantity of the blood of the rabbit was taken, and the serum separated from this was added to a solution of the original crystallised egg albumen. This addition resulted in the combination of the two substances, and in the precipitation of the egg albumen, and such quantities of each may be added that every particle enters into combination, the albumen and its anti-body neutralising one another completely and exactly, in this way acting just as do the proteid toxin of the diphtheria bacillus and its antitoxin. If the albumen used in such an experiment be pure, its range of activity appears to be exceedingly limited, whilst if it be a "mixed" albumen it appears to react against a correspondingly large number of albumens. We have here an analagous condition to that found in connection with toxins and antitoxins—comparatively simple and specific bodies, and bacterial products and antibacterial products—much more complicated substances. As pointed out in the Report, however, the proteid poisons of diphtheria are not pure toxic substances; indeed, the toxic factor appears to be of less importance than some other portions of the molecule that give rise to the special stimulation producing antitoxin, and it soon became evident that proteid poisons may become so far modified as regards minor groups of molecules (the main combining molecules remaining the same), that cells may be brought to assimilate or combine with these molecules in such a fashion that they form within their protoplasm substances which, either in the cell or separated from it, may combine with the whole molecules and, along with them, with the secondary and smaller molecules to which the special toxicity may be attributed, and thus neutralise them. That something of this kind may take place, Ehrlich points out, in connection with the neutralising power of antitoxins, as antitoxins neutralise not only true toxins but also what he calls toxoids, *i.e.*, substances apparently formed from toxins, having many of the properties of the toxins but retaining little if any of their lethal activity. He proved this in connection with diphtheria toxins by testing the combining power of an active toxin and then, after keeping this toxin in a warm chamber for some time, again testing both its lethal and combining powers. Its combining power with antitoxin remained the same, but its lethal power had fallen enormously, to one-half or one-third of its original strength. Having determined this, he found that in the case of tetanus toxin he could diminish its activity by adding bisulphide of carbon. He found, however, that this innocuous toxoid still retained its remarkable immunising and antitoxin-producing constituent.

Antitoxin production a property of nutrition.

Typical experiment.

Toxoids of Ehrlich.

The toxin molecule.

These toxic proteid molecules may be either toxic molecules linked to the proteid molecule or a proteid molecule in which certain replacements have taken place. In any case they appear to be easily linked to the living cell, and to be able to stimulate it to produce antitoxin. They are always formed in larger quantities where albumens are already present, than when the proteid molecule has, as it were, to be built up. If, now, the toxic molecules, produced in these albuminous fluids in such large quantities, can be modified as are the molecules produced in fluids containing less albumen, should it not be possible to obtain large quantities of non-toxic proteid molecules which, assimilated by the cells, will induce the formation and overflowing of antitoxins, antitoxins capable of neutralising not only the principal toxoid or large molecule, but this same toxoid molecule with its linked-on smaller toxic molecules? Cartwright Wood has proved that this is possible, and we have the result in the rapid production of antitoxin by the injection of serum-toxin which contains an exceedingly small amount of the active toxic substance.

The nature of antitoxin.

Bound up with the theories of immunity and the question of the source of antitoxin is the important question of the nature of antitoxin. The original theory already mentioned, put forth by Roux and Vaillard, and afterwards emphasised by Ehrlich, that antitoxin is the result of a special stimulation of certain cells, receives support from a large number of observations made during the preparation of antitoxin in connection with this work. It was found that it is only where there is marked reaction, especially of a local character, that any antitoxin is produced. I lay special stress on the local reaction because the toxin injected must exert its greatest stimulating power, in fact one might almost say its only stimulating power, on those tissues with which it comes directly into contact, that is, before it becomes mixed with any large quantity of lymph or finds its way into the circulating blood in which, at the temperature of the body, the combination of toxin and antitoxin goes on with great rapidity. In the blood of some of the animals under treatment the amount of antitoxin was thousands of times the quantity required to neutralise the toxin injected during the whole period of treatment.

From a study of the tables and charts (pp. 124 to 146), it will be found that the toxins injected into horses that have been under treatment for some time would, if they made their way directly into the circulation, be neutralised over and over again by the antitoxin which in such animals is present in large quantities; taken into the blood at once the toxin would be quite incapable of setting up any reaction at all. In the subcutaneous tissues, however, where at first it can act almost directly upon the connective tissue cells, its action being only slightly impeded by the small quantity of antitoxin in the lymph of these tissues, it may stimulate them to set up the production of the anti-bodies in a marked degree; so that, under favourable conditions, the production of antitoxins may go on for a long period after large quantities of antitoxin have been stored in the circulating blood. Such an explanation appears to be all the more probable from the fact that the constitutional symptoms are of such short duration, whilst even the local reaction is rapidly neutralised. Without some explanation of this kind, too, it would be exceedingly difficult to understand how it is that the vital organs of an animal are so little affected during the treatment necessary for the production of antitoxin: the amount of antitoxin in the blood is sufficient to protect the whole animal, except those tissues into which a larger amount of toxin can be introduced than can be neutralised by the antitoxin in the blood and lymph in these tissues. It is for this reason that, as the process of treatment goes on and more antitoxin is formed, stronger and stronger toxins are necessary for the production of even a slight local reaction. Toxin can only act "locally."

In the tables above referred to the theoretical standard of 100 times the lethal dose has been taken as the amount necessary to neutralise one unit of antitoxin. Taking this as a basis I have found that in certain cases 20,000 units of antitoxin have been formed for every unit of toxin injected, and in one case the figure rose as high as 40,000 antitoxin units for every unit of toxin; whilst in no case in which there was any rise at all were there fewer than 63 antitoxin units for every unit of toxin injected, and in one horse the lowest figure obtained in any experiment was 5,588 antitoxin units per unit of toxin introduced. Proportion of toxin injected to antitoxin formed.

It is now an old story but it may be here well to mention that attempts were at one time made to prove that an antitoxin might be a simple derivative of a toxin: for example, that it might be produced by the electrolysis of toxin. It was soon found, however, that in this case there was merely a destruction of the toxin by the chloro-hypochlorites produced when a weak saline solution is electrolysed, for, when no sodium chloride is added to the solution of toxin to be thus treated, there is comparatively little destruction of toxin. Later, Professor T. R. Fraser, as the result of his observations on snake venom and antivenin, came to the conclusion that antivenin was a modified venom and that the antitoxin or immunising substances produced, originate not from vital reactions of the cells of the body upon the toxins, but from chemical changes with toxins themselves, in which the toxins are disintegrated, and the anti-bodies which, under this theory, are amongst the normal constituents of the toxin are left unaltered, or, at any rate, but slightly altered after the removal of the purely toxic molecule, and are capable of again combining with fresh toxic molecules presented to them. As we have seen, however, in the horse, the amount of antitoxin formed is out of all proportion to the amount of toxin introduced, in some cases being hundreds of times as great, even calculating the test dose of toxin at its lowest toxic value of one instead of a hundred. When it was found, however, that toxins become converted into toxoids outside the body, Fraser's theory was apparently more tenable, as it was naturally suggested that these toxoids might be transition stages between toxin and antitoxin. Against this, however, are the following facts:—The toxoids, like the toxins, have the power of stimulating the cells to produce antitoxins, but they have the power also of acting like toxins in neutralising antitoxins. Again, Sidney Martin and Cartwright Wood, in the preparation of their albumoses, obtained toxins of an exceedingly active character by growing the diphtheria bacilli in a fluid containing albumen. A kind of external metabolism then appears to take place; an enzyme is formed by the bacilli, and this enzyme apparently is capable of acting upon the albumens so as to produce "albumoses." When this mixture of albumen, albumose, and toxin is heated to 60° C. it so far loses its toxic activity that although, before heating, a 20th or a 40th or even a smaller fraction of a c.c. was sufficient to kill a guinea-pig, three or even five c.c. of the heated substance produces no appreciable toxic effect when injected into a guinea-pig, or at most will induce a temporary swelling which soon passes off. Although it has lost its toxicity, however, *it exerts absolutely no antitoxic action*, and is no more capable of neutralising toxin than it was before it was heated, though when introduced into the tissues of the horse, it is, as already stated, found to still possess in a most remarkable degree the power of stimulating cells to the production of antitoxin. It is a toxin greatly modified no doubt, but not in any way converted into an antitoxin, as it neither increases nor diminishes the antitoxic action of a test dose of antitoxin acting upon a test dose of toxin; it has the physiological action of a toxin from the nutritive point of view—it may be assimilated, and can so produce a specific reaction in the cells, but it does not possess the power of combining with, or assisting, either toxin or antitoxin outside the cells. Antitoxin not a modified toxin.

Antitoxin still produced after blood (containing toxin) is withdrawn.

As early as 1893 Roux and Vaillard pointed out that animals treated with toxin may lose blood equal to the whole of the body weight, if this loss be prolonged over a period of several days, without there being any marked falling off in the antitoxic value of the blood that remains. Here we have evidence that the production of antitoxin must be going on as the continued result of a special stimulation of the antitoxin-forming cells; the toxin has all disappeared, but antitoxin is still being formed. Salomonsen and Madsen have also proved that there may be an actual rise of antitoxin after considerable volumes of blood have been withdrawn from an animal treated with toxin, and they agree with those who maintain that there is a new production of antitoxic substance going on as a result of a special stimulation of the tissues. My observations, as I have before stated, all go to prove that an antitoxin is in a great measure formed locally, that it is the result of a special reaction between the toxin and the connective tissues, and that the antitoxin is produced as a kind of secretion from these special cells reacting to the special stimulation.

Excretion of different antitoxins.

There are several points to be cleared up in connection with the question of specificity. Salomonsen and Madsen, and later Behring, Bulloch, and others, have shown that there is a constant drawing away of antitoxin from animals. In the animals injected with antitoxin from other species this leakage goes on very rapidly, and it is for this reason that the passive immunity—if one may use the term—conferred by antitoxin is of short duration, for Behring and Ransom have demonstrated that when the antitoxin is formed in an animal, it remains present for a very considerable period; here we have at once an explanation of the fact that a patient injected with antitoxin is protected for a comparatively short period, whilst a patient who has suffered from an attack—even of diphtheria, in which the period of protection is not nearly so prolonged as in other diseases—is protected for a considerably longer period. In this must be sought the explanation of the fact that we meet with relapses somewhat more frequently in cases of diphtheria treated by injection with antitoxin, the antitoxin injected coming from a species—the horse—different from the patient injected.

The question of specificity, however, is much more fundamental and far-reaching even than this. For Cartwright Wood, in a series of experiments carried out during the last four or five years, has shown that in the rapid method of production of antitoxins it is necessary to use in the preparation of the serum toxin a serum taken from the same species of animal as that which is to be injected. He has found, for instance, that the serum toxin prepared with the serum of a horse gives admirable results when injected into a horse; but Ehrlich, using the same batch of serum and injecting a goat, found that he obtained practically no positive results; and Wood, carrying on his experiments with rabbits, guinea-pigs, and pigeons, found that the specificity was in each case more or less distinctly marked, and that each animal could only be treated satisfactorily—*i.e.*, with the formation of antitoxin in large quantities or the production of a definite immunity—when the serum toxin is prepared with the serum of the animal to be injected. This points rather to the fact that the intermediate link described by Ehrlich is a most important factor in the production of immunity, the proteids contained in these albumoses being more readily assimilated by the cells, when cells and proteid are both, as it were, of the same species. The blood of one species, then, may be looked upon as behaving as a foreign body when introduced into another species

This, again, has a most important bearing on the question of assimilation, and it may be that the toxin or toxoid is simply linked on to another or intermediate molecule which keeps it in contact with the cell protoplasm, and so enables it to set up the production of antitoxin.

This Report was written three years ago.

This Report is now over three years old. The main portion of it has been in type for nearly three years, but owing to my removal to Cambridge and the organising and teaching that I have had to carry on during Term-time and a great part of the Vacation, I have been unable to devote more than portions of each vacation to the revision of the proofs.

All the figures have been revised.

As several errors were detected in the earlier tables it was found necessary to check every figure in the Report, and, although but few others have been found, the labour has been very considerable, and without the assistance of Mr. F. G. Binnie I should, even now, be unable to present a revised and completed statement. In certain respects the delay in the issue of the Report may prove to be advantageous, as one has been able to check and control methods, observations, and figures. The material here presented constitutes a mass of statistics such as could not have been collected elsewhere, and it is specially desirable that it should take as permanent a form as possible.

These figures will form a standard for comparison in the future.

The figures themselves, whatever may be said of the notes and criticisms, are not of mere ephemeral interest; they will form a standard of comparison for future work by which may be gauged improvements in treatment, and in the results obtained, that may be of inestimable value. This is not the place for the discussions of theories or the presentation of hypotheses, and, although here and there notes and suggestions may be made, there has been no attempt to discuss other work, published or unpublished.

Acknowledgment of assistance received

Although I alone am responsible for the statements made and figures given in this Report, no one is more fully aware than I am of the impossibility of carrying out such a task without the advice and assistance of a most competent staff. I cannot fully express my obligation to all who have assisted me, but I must take this opportunity of thanking, in however inadequate a fashion, the medical officers of the hospitals under the Asylums Board for the heartiness with which they have invariably co-operated in carrying out suggestions and in helping to obtain statistics.

in statistical work,

To Mr. Richardson and especially to Mr. Bernard Locke, temporary clerks under the Board, I am under obligation for valuable assistance in the collection and arrangement of statistics, and to the

authorities of the Asylums Board for the courtesy and consideration invariably extended to me, sometimes even under trying conditions. In the examination of the tubes, the preparation and microscopic examination of the "swabs" from the throats of the diphtheria patients, I am indebted, first to Mr. A. H. Card, M.R.C.S., L.R.C.P. (Lond.), and then to Mr. James Hussey, M.B. (Lond.) F.R.C.S. (Eng.), for careful and most painstaking assistance; indeed, I may say that without the assistance of these gentlemen it would have been impossible to carry on the work. In connection with this part of the work, too, I am greatly indebted to Mr. F. G. Binnie and Mr. Paulus Shekwana.

Acknowledgment of assistance received in bacteriological work.

Perhaps the most important and responsible work, however, was that involved in the preparation of toxins and antitoxins. Here I received valuable suggestions from Dr. Alan Macfadyen and Dr. Bulloch of the Jenner Institute of Preventive Medicine, from Professor A. E. Wright, of Netley, and Professor Sidney Martin, Dr. Roux, Dr. Madsen, and Professor Salomonsen. To Mr. Bokenham, M.R.C.S., L.R.C.P., I am indebted for several samples of active diphtheria bacilli, some of which were used in the earlier part of our work. To Mr. James Millar I am under deep obligations for continuous and unwearied help; no trouble was too great for him to take, and his intelligent co-operation in the work was often invaluable. Mr. A. Doudney, the assistant in the laboratories, by his ingenuity in carrying out our instructions and in devising some of the apparatus, also contributed towards the success of the work. To Mr. Andrew Pringle I am indebted for the excellent photographs of bacilli that accompany this Report, to Mr. A. Doudney for photographs, to Mr. F. G. Binnie for drawings for the illustrations of apparatus, and to Mr. J. Walker for assistance in the preparation of the charts.

in the preparation of toxins,

in the preparation of illustrations,

It is, however, to Dr. G. E. Cartwright Wood, B.Sc., to whom I owe most. Without his assistance some most valuable work must necessarily have remained incomplete. His brilliant observations and work in connection with the rapid production of antitoxin ante-dated everything else of the kind, and to his researches may be attributed a very considerable measure of the success in the production of powerful antitoxins that has been attained not only in this but in other countries. In such a Report as this it is impossible to assign to each individual his exact share in the success of the work, but to Dr. Cartwright Wood I beg to tender my warmest thanks for his very great share in contributing material and data for use in the present Report, and, although I ask him to accept no responsibility, I wish to indicate as plainly as possible what a great share his observations and suggestions have had in moulding the form and adding to the substance of what is here written.

and in the preparation of antitoxins.

Indeed I may say that almost every worker in the laboratories on the Embankment has either directly or indirectly contributed something. Dr. A. E. Wright's work on the acceleration and retardation of coagulation led us to the method of adding small quantities of citrate of soda to the blood in order to delay coagulation for a sufficient length of time to allow of the separation of the corpuscular elements from the plasma. Dr. Sidney Martin's work on albumoses (1) had an influence in determining the direction of Dr. Wood's work on heated serum toxin; whilst several hints were obtained from Dr. Brodie's chemical work on antitoxin (2). I am very anxious to insist upon this at the present time as there appears to be a reactionary tendency in the direction of multiplying laboratories in the same centres, and so of dividing workers and financial assistance, without which it is impossible to carry on work to the best advantage. It is a good thing to multiply laboratories in different centres, but it is a mistake, especially in comparatively sparsely populated and the poorer districts, to multiply laboratories in the same centre.

Thanks to workers in the laboratories.

Advantages of a central laboratory in carrying on this work.

Finally, I wish to thank the Laboratories Committee of the Royal Colleges for the facilities placed at my disposal for carrying on this work, the Goldsmiths' Company for their public spirit in making such generous contributions to the funds of the laboratory—without the help afforded by these funds it would have been impossible to carry on much of the experimental work or to send out the surplus antitoxin to be used by poor patients elsewhere than in the hospitals under the control of the Metropolitan Asylums Board; and Mr. F. G. Hallett, the Secretary of the Conjoint Board of the Royal Colleges, for his constant and cheerful assistance and encouragement when these were most needed.

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(1) Suppl. Loc. Gov. Board Report 1892–3, p. 427. Goulstonian Lectures, *British Medical Journal*, 1892: Vol. i. pp. 641, 696, 755.

(2) *Journ. of Path. and Bact.*, Vol. iv., 1897, p. 460.

REPORT

On the Bacteriological Examination of Specimens from cases notified as, or supposed to be, Diphtheria, that have been examined during the years 1895 and 1896, and treated in the Hospitals under the Metropolitan Asylums Board during the latter part of 1894, the two years 1895 and 1896, and the early part of 1897.

REPORT

On the Bacteriological Examination of Specimens from cases notified as, or supposed to be, Diphtheria, that have been examined during the years 1895 and 1896, and treated in the Hospitals under the Metropolitan Asylums Board during the latter part of 1894, the two years 1895 and 1896, and the early part of 1897.

To the Managers of the Metropolitan Asylums Board.

I beg to present the following Report on the Bacteriological Examination of cultivations from throats of patients supposed to be suffering from Diphtheria, and treated in the hospitals of the Board. Introductory.

On the 26th October, 1894, a communication was received by the Laboratories' Committee of the Conjoint Board of the Royal Colleges of Physicians and Surgeons from the Managers of the Metropolitan Asylums Board, in which was contained the enquiry "whether the Royal Colleges of Physicians and Surgeons could afford the Managers facilities for the bacteriological investigation of doubtful cases of diphtheria which may be sent to the Board's hospitals from time to time." Negotiations.

At a meeting of the Committee called to consider the question, it was felt that, in the interest of the public, it was the duty of the Royal Colleges to assist the Metropolitan Asylums Board by conducting for them the investigation referred to, provided arrangements could be made for so doing without interfering with the work of those who have been permitted to undertake scientific researches in the Laboratories; the Committee therefore agreed to undertake the investigation on the following conditions:—

(1) "That the investigation be carried out by special persons to be appointed by the Laboratories' Committee under the superintendence of the Director, Dr. G. Sims Woodhead." Conditions.

(2) "That the Metropolitan Asylums Board defray the expenses of the investigation, including the salaries of those occupied in the work."

These terms were agreed to by the Metropolitan Asylums Board, and an agreement for a period of six months, commencing on the 1st January, 1895, was entered into. Under this arrangement it was proposed that not only should cases be examined on admission to hospital, but cases should be subjected to similar bacteriological examination before they were discharged. It was calculated that the number of examinations to be made per diem would not exceed 20.

From 1st January to the middle of February I was engaged in organising the work, and in personally examining, bacteriologically, the specimens that came from the hospitals; but in the middle of February Mr. A. H. Card, M.R.C.S., was engaged to assist in this bacteriological examination. In June, 1895, the Metropolitan Asylums Board requested the Laboratories' Committee to continue the work for a further period of six months, and the Committee agreed to do so, and to sanction the engagement of further assistance, in order that the work, which now very much exceeded what had originally been anticipated, might be accomplished. Work commenced.

It was estimated in the first instance that the daily average number of cases would not exceed 20, whereas the cases examined rarely fell below, and very frequently greatly exceeded that number; in one instance at least the number reached 115; in the following half-year this number also was exceeded on several occasions, and on two occasions rose to 150. In June, 1895, in conjunction with the Medical Superintendents of the hospitals, I undertook to report fully to your Board on the cases examined, and in November of 1895 an interim Report was presented. In December, 1895, the arrangement *re* the bacteriological examination was renewed for a period of six months. In March, 1896, Mr. James Hussey, M.B. (Lond.), F.R.C.S. (Eng.), was appointed to succeed Mr. Card, and in June, 1896, the arrangement with the Board was continued for a further period of six months, but at the end of that time the agreement was allowed to lapse, and in January, 1897, arrangements were made under which the Laboratories' Committee undertook to supply the hospitals of the Board with tubes of Loeffler's cultivation medium, to be used for purposes of bacteriological investigation in connection with cases of diphtheria admitted into the hospitals. The present Report deals exclusively with the cases that were examined bacteriologically during the period embraced between the dates, January 1st, 1895, and December 31st, 1896. Number of cases examined. Examination discontinued. Serum tubes supplied.

APPARATUS AND METHODS.

Methods. For convenience of investigation, and in order to determine how far the methods in general use were reliable, during the first three months that specimens were examined, microscopic examinations of the fresh secretion from the throat were made as soon as the material arrived at the Laboratory. At the same time that the microscopical specimen was obtained from the throat a culture medium was inoculated; after 16 hours' incubation the resulting growth was carefully examined. A note, asking the Medical Superintendents of the various hospitals to have this inoculation made on Loeffler's nutrient serum, was then sent out. In order that the culture might be made with as little trouble as possible, the following outfit, slightly modified from that used in New York, was prepared. It consists of a cardboard box (Fig. 1) addressed to the Laboratories, containing:—(1) a "swab;" (2) a tube of Loeffler's serum; (3) a copy of "Directions;" (4) a form on which the details of the case are entered.

(1) The swab. *The Swab.*—(a) A small pledget of cotton wool, attached to an iron wire with a roughened end, is placed in a clean test-tube (b) which is afterwards plugged with cotton wool; the whole is then heated at a temperature of 160–170° C. for two or three hours, in order that the cotton wadding may be completely sterilised. These "swabs" are then ready for use at any moment.

(2) Tube of Loeffler's medium. *Composition of Loeffler's Nutrient Medium.*—Loeffler, as the result of a long series of experiments, came to the conclusion that the best medium on which to grow the diphtheria bacillus is a mixture of three parts of blood serum and one part of bouillon, containing 1 per cent. each of peptone and grape sugar and 0·5 per cent. of sodium chloride, the whole being rendered slightly, or even distinctly, alkaline. Glucose gelatine, alkaline gelatine, ordinary agar, glycerine and glucose agars, and mixtures of glycerine agar and gelatine were all in turn tried experimentally, but in no case were the results so satisfactory, especially for primary cultivations from the membrane and swabs, as was Loeffler's serum. During these investigations Dr. Cartwright Wood prepared a medium in which decalcified blood plasma took the place of the blood serum, and during the last two years and a half this medium only has been used.

These swabs and tubes of nutrient medium were prepared in large numbers and were sent out as required, along with the following directions (based on those in use in New York) for obtaining the material for diagnostic purposes:—

(3) Instructions "Place the patient in a good light. Remove the cotton wadding stopper from the tube containing the iron wire. Depress the tongue with a spatula, and rub the cotton wadding pledget, fixed on the end of the rod, gently but firmly against any visible exudate, or in other cases, including those in which the exudate is confined to the larynx, pass the pledget as far back as possible and rub it freely against the mucous membrane of the pharynx and tonsils.

"Still keeping the wire in one hand, withdraw the stopper from the tube containing the solidified blood serum, then rub the pledget once or twice over the surface of the serum, taking care not to break this surface in any way; replace the plug, and then return the wire rod with its pledget to its tube, which should be restoppered at once.

"In those cases in which a distinct membrane is visible, transfer, by means of a platinum spatula (heated to redness and then allowed to cool), a fragment of the membrane to the tube containing the wire rod; replace the wadding stopper.

"Pack the two tubes in the box, taking care to have a little wadding at each end, label the serum tubes, fill in the form enclosed, and send off the box by the first post, or by special messenger.

"A report will be forwarded within twenty-four hours if possible."

(4) Form for details. The following is a copy of the form accompanying each box (filled up as returned to the hospital):—

DIPHTHERIA.

Hospital, S.W. *Case No.*, 1147.

Name, Francis Smith.

Age, 13 years.

Sex, Male.

Address, 11, John Street, Clapham, S.W.

Admitted, 10/11/96.

Date of Illness, 8/11/96.

Diagnosis, Diphtheria—Doubtful.*

* Cross out the word "Diphtheria" or "Doubtful."

Any Complications, Albuminuria, enlarged cervical glands.

Examination made—Hour, 8.30 p.m. *Date*, 10/11/96.

Sent out—Hour, 9 a.m. *Date*, 11/11/96.

Laboratory No., 7131.

Received—Hour, 10.15 a.m. *Date*, 11/11/96.

Reported on—Hour, 11 a.m. *Date*, 12/11/96.

Result of Bacteriological Examination—

Diphtheria bacilli, Long, short, wedge-shaped.

Other bacteria, Streptococci, Staphylococci.

In cases of re-examination refer to previous Laboratory Number ....

Form of box

The boxes into which the two tubes and their directions, &c., were packed were in the first instance made of wood, and were copied from those made in America. The wear and tear and general waste of these boxes, however, was so great when as many as three or four hundred specimens were being examined in one week, and their packing was a matter involving so much time and labour, that ultimately I had constructed for this special work a card-board shell (e) covered with a lid (f), and containing an inner box (d) with a partition down the middle, dividing it into two spaces, each of which holds a test tube. At the bottom of each of these spaces a wad of cotton wool is placed, so that they are always ready for the reception of tubes. The two tubes, one with the swab (b), the other containing the Loeffler medium (c), are after inoculation replaced, each in its own compartment; the inner box is then returned to the outer shell, which is already addressed, the small cardboard lid (f) is closed, and is then kept in position by means of a couple of tapes or by gummed paper, if the box is to be sent by post; or by an elastic band, when the boxes are conveyed from the hospitals to the Laboratories by hand.

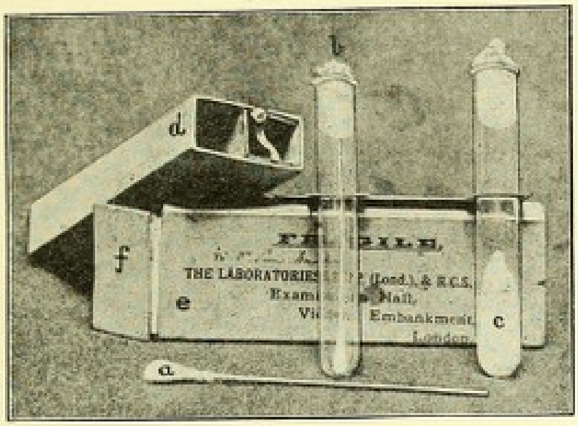

FIG. 1.—POSTAL-BOX WITH SERUM TUBE AND SWAB.

Difficulties of transmission of specimens.

As difficulties arose in connection with the transmission of large numbers of these parcels through the post, and as it was found that there was always a greater delay when they came by post than when they were delivered by hand, arrangements were ultimately made by which the specimens were brought in by special messengers twice a day—in the morning and in the afternoon.

Direct examination of swab.

As already mentioned, a microscopical examination was at once made of most of the swabs that came in during the first few months. In order to obtain a cover-glass preparation, cleaned cover-glasses were smeared with the material that adhered to the swab when it was passed over the mucous membrane of the suspected throat. This was done as soon as possible after the swab came to hand and whilst it was still moist. These cover-glass preparations were then dried, fixed, stained, either with methylene blue, or according to a modification of Gram's method, afterwards described, mounted in balsam, and examined.

Proportion of positive cases recognised on direct examination.

In about 25 per cent. of the positive cases that were sent to the Laboratories for examination it was possible to make out the presence of diphtheria bacilli in these fresh cover-glass preparations, but, as a rule, these were the cases in which there was no doubt as to the nature of the disease in the mind of the physician treating the case; and ultimately it was decided that owing to the great additional amount of time and labour involved, and to the fact that those cases in which positive results were obtained were just those in which the patients would in any case be at once treated as suffering from diphtheria, the fresh examination should be discontinued, and the cultivation method alone relied upon. This, of course, involved a little delay, as regards a certain proportion of the cases, but it certainly halved the work; and when the number of cases to be examined often reached 80 or 90 per day, and not rarely 100, and sometimes even 150, this was a consideration that necessarily had great weight.

EXAMINATION OF CULTURES.

Record kept.

Each box on arrival was opened, a running number, together with the time and date of arrival, was put on the "filled in" form enclosed in the box, and the inoculated tube, after receiving a similar number, was placed in the incubator at a temperature of 35° C.; it was kept there until the following morning. The particulars from the numbered forms were then copied into a Diagnosis Record Book (each of which consists of 500 forms similar to that given on page 4, with the exception that space is allowed for notes on the clinical history of the case, and on treatment and result), under similar numbers.

Each morning the cultures received on the previous day were taken out of the incubator, arranged in their numerical order, and examined in the following manner:—

Preparations of specimens for examination.

Cleaned cover-glasses, one for each tube, were laid out in series on numbered cards. Samples were taken with a sterile platinum needle from each distinct and suspicious-looking colony in a tube, or the needle was swept across several colonies of similar kind and rubbed up and spread out in a drop of sterile water on the cover-glass, each kind of colony generally forming a separate streak; as a rule, three streaks were made on each cover-glass. The cover-glass films were then allowed to dry, and subsequently were passed two or three times carefully through a small Bunsen flame *secundem artem*, great care being taken not to burn the film; these films may be fixed equally well, and perhaps with greater regularity, by placing them in equal parts of ether and alcohol.

Nicolle's stain. The staining adopted was a modification of Gram's method, devised by Nicolle,* consisting in the substitution of carbolic acid for aniline water, and in the use of a stronger iodine solution and of acetone in the decolorising fluid. The staining fluid consists of 10 c.c. of a saturated alcoholic solution of gentian-violet added to 100 c.c. of a 1 per cent. solution of carbolic acid; this has the great advantage over aniline water that it may be kept indefinitely. The iodine solution consists of 1 gramme of iodine, 2 grammes of iodide of potassium, and 200 c.c. of distilled water.

The fixed cover-glass preparation remains in the stain for about five seconds, and is then passed directly into the iodine fluid, where it remains for about five seconds, after which it is decolorised by being passed rapidly through a mixture of one volume of acetone with four volumes of absolute alcohol; this removes all unfixed stain almost instantly. The specimen is then at once dehydrated in xylol, allowed to dry, and mounted in balsam.

Loeffler's stain. As an alternative method of staining, Loeffler's methylene-blue solution was sometimes used: saturated alcoholic solution of methylene blue 30 c.c., 0·01 per cent. solution of caustic potash 100 c.c.

The preparations were examined at once, and the result entered on the numbered form, a duplicate entry being made in the Record Book. The forms were then returned by post to the various hospitals.

Naked-Eye Appearances of Cultures of the Diphtheria Bacillus and of other Organisms on Blood Serum.

Rapid growth of diphtheria bacillus colonies. If, after inoculation, the tube is at once placed in the incubator, the diphtheria bacilli present in the tube will—as this organism usually grows more rapidly on Loeffler's serum when kept at incubation temperature than do the other organisms found in the throat—get the start of the other organisms, and distinct colonies may often be found as early as the twelfth hour after incubation has commenced. Should the examination be delayed much beyond twenty-four hours the other organisms present in a mixed culture make their appearance, and once they manifest themselves they usually grow very rapidly, and may overgrow and obscure the colonies of the diphtheria bacillus, especially if these latter are only few in number. The task of searching for the diphtheria bacillus is then rendered much more difficult and uncertain.

18-24 hours. In a preparation examined at from eighteen to twenty-four hours, the diphtheria bacillus grows as rounded, elevated, moderately translucent grayish-white colonies (very young colonies are elevated, almost hemispherical, and are more translucent), with a yellow tinge; the yellow tinge, however, though almost invariably present, is, as a rule, very slight. Such colonies have a moist surface, and a distinct and only slightly irregular or scalloped margin. By transmitted light they show an opaque centre due to a more active growth, and therefore greater thickness, at this point. In the older colonies this opaque spot becomes still more evident and even button-like. If the colonies are few and widely separated, each may grow to a considerable size (4-5 mm), but when more numerous and closer together they remain small and almost invariably discrete, with distinct intervals between them, except where the condensation fluid from the serum has been allowed to flow over the surface of the medium.

Older growths. In older growths of the diphtheria bacillus the colonies become more flattened, their central opacity becomes more marked and even button-like, the crenation of their margins becomes more distinct, and they lose their moist, shiny appearance and become dull. Around the button-like centre there may often be seen one or more ring-like depressions indicating periods of stronger and weaker growth. This is usually accompanied by a radial striation, which may extend from the periphery to the centre of the colony. The crenation of the margin is said to be due to peripheral formation of new centres of growth, which partially free themselves from the original colony, often showing the outline of one-third or half or more of a colony, with indications of a thickened central point or focus.

Growth is very luxuriant for some time after the colonies have once become macroscopic, but after 30-48 hours it gradually becomes less rapid. When the surface of the serum is dry, the growth is impeded and may never be very rapid at any stage.

Surface growth along needle track. In stroke cultures a grayish streak is formed along the track of the needle; the lateral growth which takes place goes on very slowly, and is more pronounced towards the lower end of streak (where the medium always retains more moisture than in the thinner portion), and as the culture grows, corresponding to the central nodule of the single colony, a thickened band forms down the middle—growth in vertical direction—thinning off to the margins, which are sharply defined and distinctly crenated as the band grows out on to the surrounding medium. The streak thins out at the upper extremity, and then often breaks up into isolated colonies with the well-marked characters described above, usually, however, growing somewhat more slowly. This method of growth distinguishes the diphtheria bacillus from the staphylococci and streptococci inoculated in the same way.

Optimum temperature. Growth takes place at any temperature between 22° and 40° C., but the most luxuriant growth undoubtedly occurs between 35° and 37° C. The reason that Loeffler described this organism as not growing on gelatine was that it grows so slowly at the temperature at which gelatine media will remain solid. "Hoffman's" bacillus grows much more readily below 20° C., and therefore more easily and luxuriantly on nutrient gelatine.

* Annales de l'Institut Pasteur, t. ix., 1895 (p. 666).

Besides the two chief media for the cultivation of the diphtheria bacillus—blood serum and broth—which have been described, this organism will grow on all the ordinary alkaline culture media—agar, glycerine-agar, gelatine, milk, and potato (when its surface is made alkaline)—although not so luxuriantly as on blood serum, except in the case of milk, in which it grows well. It also grows well in or on ascitic fluid (especially when diluted), egg-albumen, and alkali-albumen. Nutrient media.

Agar (and more especially glycerine-agar) forms a good nutrient medium, but the growth on this is not nearly so abundant as on Loeffler's broth serum mixture. After long-continued cultivation on agar the typical, active, virulent diphtheria bacillus ultimately appears to die out. The pseudo-diphtheria bacillus and the less active shorter form, on the other hand, grow luxuriantly on this medium; the growth having much the same appearance that the true form of diphtheria bacillus assumes on Loeffler's serum. Growth on agar.

The diphtheria bacillus, as already noted, may be grown on gelatine, which it does not liquefy, at a temperature of 22° C. or 24° C., beyond which limit gelatine, except that too solid for use, melts and becomes softened. Klein and Escherich, however, consider that gelatine is an excellent medium, as the growth, though less luxuriant, has all the characters of the serum growth. The pseudo-diphtheria bacillus grows more luxuriantly on gelatine, but the difference is not quite so marked as on agar. Growth on gelatine.

Guinochet, in 1892, proposed normal human urine as a medium in which to grow the diphtheria bacillus, and Escherich finds that, although the bacillus grows well in this medium, the addition of a small quantity of alkali (one or two drops of normal potassium hydrate solution to the contents of an ordinary test-tube) increases the activity of the growth. Schloffer recommended mixtures of urine and bouillon, and urine and agar, but points out that the bacilli growing in, or on, these media are somewhat shorter and show fewer degeneration forms than do those growing in the ordinary media. Growth in urine.

The main points of difference between the naked-eye appearances of the colonies of the closely allied non-pathogenetic pseudo-diphtheria bacillus, when grown on serum, and those described above for Loeffler's bacillus, so far as I have observed and as far as the facts are established—for there exists some little discrepancy in the statements made by different writers—are that the colonies are usually pure milk-white, are flatter, more moist on the surface, softer in consistence, and exhibit a greater tendency to run together; they are more easily removed *en masse* with the needle than are those of Loeffler's bacillus, and they retain these characters for a longer time; but the changes with age described above for the true diphtheria bacillus—flattening out, disappearance of the shining, moist appearance of the surface, crenation, the concentric rings, and the radial striæ—all ultimately appear when the growth takes place on a favourable medium. The differences just described are relative, not absolute; they are often sufficiently well marked to raise doubts, but are not decisive, and must be confirmed by observations as to the behaviour of the organism in other nutrient media, especially as regards the formation of acid, microscopic examination, and—most important of all—animal experiments. Characters of the pseudo-diphtheria bacillus.

As regards the growth of the pseudo-diphtheria bacillus on the other culture media, it exhibits in its growth in broth, as compared with that of Loeffler's bacillus, a much more marked turbidity—which appears earlier and continues longer—an acid reaction is said not to take place, but, on the contrary, the broth tends ultimately to become more alkaline. On agar and gelatine, especially the former, it grows more luxuriantly; this character is considered by Escherich and others to be one of great diagnostic value. It will grow on gelatine at a lower temperature than does the true form, even at 18° C., according to Zarniko.

Another series of closely allied but non-pathogenetic forms are described as the Xerosis bacillus. Probably several slightly different forms have been described under this head by different investigators, and Loeffler considers that probably they all, with the diphtheria bacillus, belong to one group or natural family, and that although "all are distinguished by peculiar club-formation, and by isolated stainable granules, they offer, on closer comparison, small but constant morphological and cultural differences." The Xerosis bacillus grows best on blood serum. In broth a flocculent growth takes place rapidly, with no formation of acid, and agar needs the addition of glycerine in order that it may become a good medium for its growth. The Xerosis bacillus.

The naked-eye appearances of some of the other organisms more frequently found growing in a mixed culture on serum inoculated from the throat of a patient, but which differ considerably or entirely on microscopical examination, are the following:—

The potato bacillus is of frequent occurrence in such cultures, especially in summer. It grows exceedingly rapidly, first as a moist viscid layer over the whole surface of the serum. It quickly, however, assumes the form of a membrane with a characteristically wrinkled or corrugated appearance; beneath this skin liquefaction of the serum takes place. This is a very troublesome growth, as, although very different from the growth of the diphtheria bacillus, it makes diagnosis difficult by overgrowing and impeding the growth of this latter organism, if present, and rendering the result of a search for it a very uncertain matter. The potato bacillus.

The colonies of streptococci appear at the end of twenty-four hours as minute transparent dewdrop-like points, almost as high as they are broad, scattered over the surface of the serum. These are so far characteristic that they can seldom be mistaken for any other micro-organism, whilst a microscopic examination at once sets the matter at rest. Colonies of streptococci.

The colonies of staphylococci show a flattened spreading, irregular, more opaque, moist growth of even thickness throughout—*i.e.*, with no thickening or elevation in the centre. These colonies, as a rule, are not so distinctly rounded; they have neither concentric nor radial striation, and are slightly more irregular in outline than are those of the diphtheria bacillus. They develop less slowly at first, but more rapidly after the first twenty-four hours. Here again the microscopic examination at once removes any doubt that might exist in the mind of the observer. Colonies of staphylococci.

Colonies of yeasts.

Yeasts are still more opaque than the staphylococci, and often have a creamy tinge; they may form masses of very considerable size, especially after growing for several days. The microscopic diagnosis is very easy and definite.

Colonies of the Brisou coccus.

The surface of the colonies of the Brisou coccus (which at first sight bear some slight resemblance to diphtheria bacilli colonies) is stated by Roux and Yersin to be more moist than in the case of the colonies of the diphtheria bacillus; moreover, by transmitted light they show no opaque centre, no concentric or radiating striæ, are translucent throughout, and are readily distinguished from the diphtheria bacillus under the microscope.

Morphology of the Diphtheria Bacillus.

Form and size.

The diphtheria bacillus is usually a slightly curved (seldom straight) rod, with rounded, pointed, or club-shaped end or ends; the length of this bacillus is from 1·2 to 2·0 μ or more, the breadth from 0·3 to 0·5 μ. It exhibits a very great variety of form, which is determined, or, at any rate, greatly influenced, by the age of the culture and the nature of the medium upon which the organism is being grown. It appears to be non-motile.

Staining.

The diphtheria bacillus retains the stain somewhat firmly when Gram's method is used, as already described under the heading "Staining." On this point there is a great want of unanimity amongst the authors of the recognised text-books; some affirming that it stains by Gram's method, and others that it certainly does not. This, no doubt, may be explained by the fact that the bacillus will not, as a rule, withstand a prolonged action of the decolorising fluid; under the ordinary conditions with which Gram's method is employed, however, it certainly retains the dye. This method is a very valuable one, since by its aid we are at once able to eliminate from the field of the microscope many of the bacilli found in the throat, which are not stained by Gram's method; we are not able to do so by the methylene-blue method. This latter method—using Loeffler's alkaline formula—is, however, extremely useful from the fact that it exerts a differentiating action on the protoplasm of some forms of the diphtheria bacillus, staining certain bacilli in such a fashion that we get clear bands between deeply stained masses of protoplasm, the micro-organism thus assuming a striped appearance. This is a very characteristic feature of the diphtheria bacillus, especially in its longer forms, and in the cylindrical portion of club-shaped rods; this striping is more rarely found in the club-shaped part itself, which, as a rule, is uniformly darkly stained throughout. Some of the very short rods may have simply a single clear band between the deeply stained rounded ends, thus resembling diplococci. The bacillus does not always react thus to Loeffler's stain, and it has been surmised that this is greatly a question of the age or activity of the bacillus. I am inclined to agree with Escherich that this banded appearance is frequently absent in young, quickly growing forms, and is most commonly met with in somewhat older blood serum cultures.

Classification: Short bacilli.

The classification I have used in the tables differs somewhat from that made and used by Escherich, who roughly classifies them under three main heads. His first group, under which our short, wedge-shaped, and irregular forms would come, is characterised by a short compact form with rounded angles, which is usually more or less pointed at one end—*i.e.*, it is wedge-shaped—and with little or no signs of differentiation into light and dark bands when stained with alkaline methylene blue. This wedge shape, he acknowledges, may, however, take a great variety of forms: the pointed end may be more or less attenuated, the thick end may also become pointed; this shape, again, is influenced by variation in length, the longer forms often being slightly curved. In this way we get the various forms termed spindle-shaped, pear-shaped, comma-shaped, &c., and when shortened in length, and with little difference between the ends, we have a form very similar to the ordinary short or short ovoid form, though, as a rule, with the polar staining more distinctly marked. The bacilli of this group have usually the above-mentioned dimensions—from 1·2 to 2·0 μ long, and from 0·3 to 0·5 μ broad.

Long bacilli.

Escherich's second main group comprises slender, cylindrical, often gently curved rods similar to the tubercle bacillus, but twice as broad. There is usually no marked differences between the two ends. This I speak of as the long form, which usually exhibits, when stained with alkaline methylene blue, and even at times when stained by Gram's method, the characteristic striping of alternate light and dark bands. The bacilli in this group usually have a length of from 3·0 to 4·5 μ, and a breadth of from 0·4 to 0·5 μ.

Club-shaped bacilli.

Escherich's third main group corresponds with the group here termed "club-shaped" bacilli. The members of this group may develop from the preceding group by a still greater increase in length, they may be as much as 6·0 or 8·0 μ long, and by one or both ends becoming swollen—club-shaped. Many of the more extreme forms in this group are often spoken of as involution or degeneration forms; analogous to similar forms in other bacteria brought about by insufficient nutrition. As, however, they often occur on media containing abundance of food, —*e.g.*, on blood serum—we might with Escherich rather assign as the cause of this modification a superabundance of nutritive material. It is rare to find amongst the members of this group any distinct evidence of division or multiplication, though they sometimes assume a branched form that is somewhat characteristic, almost like the branching and club-shaped filaments of tubercle and tetanus bacilli. The banded appearance is usually met with in this group, especially in the shaft of the club, as already mentioned when discussing the methylene-blue reaction.

Involution forms.

Besides these three main groups, there are found in certain cultures, especially very old ones, most extraordinary forms: long, irregular, spiral, or swollen and sausage-like chains or strings, which are usually looked upon as being irregular forms of Loeffler's bacillus, and which may be, and probably are, true involution forms. On several occasions I have noted branched forms in the cultivations: Escherich does not describe them, but several observers have already called attention to them.

PLATE I.

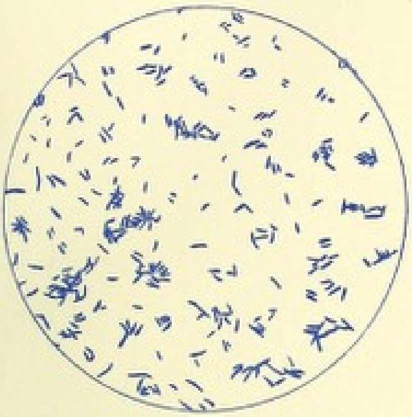

Fig. 1.

Fig. 1.—Group of long, short, and irregular diphtheria bacilli (stained by Gram's method) from Cultivation No. 12793. The colour, however, is given blue in the plate instead of gentian violet, but the distribution of the stain is equally well seen. X 700.

Fig. 2.

Fig. 2.—Diphtheria bacilli, stained by Löffler's method to bring out segmented appearance of the long bacilli. This specimen was made from Cultivation No. 13394. A number of club and spindle-shaped forms, with a few short and irregular forms, as well as a few oval streptococci, are seen in this cultivation. X 1000.

Fig. 3.

Fig. 3.—Group of short diphtheria bacilli (stained by Löffler's method, as in the preceding case) from Cultivation No. 12975. The segmentation is here to a great extent wanting, and the grouping is much more regular, but the short rods, in place of being rounded at both ends as in the case of Hoffman's bacillus (the pseudo-diphtheria bacillus), are pointed and spindle-shaped bacilli, on cultivation in many cases giving the most active toxin. The forms with rounded ends are indistinguishable from Hoffman's bacillus. X 1000.

PLATE II.

FIG. 4.

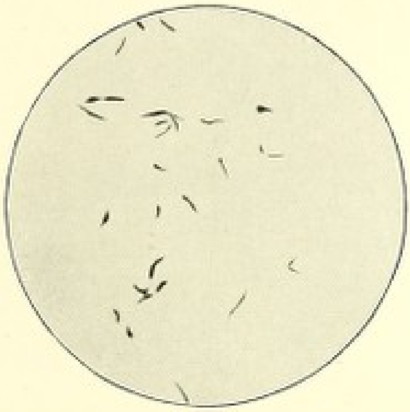

FIG. 5.

Fig. 4.—Photograph of specimen from Cultivation No. 1776—a fourth cultivation of diphtheria bacilli. Here are seen the long thin threads with segmented protoplasm; a few bacilli are swollen and club-shaped; the great variety of form is well brought out in this specimen. X 1000.

Fig. 5.—Photograph of specimen from Cultivation No. 2271. Here are long curved and pointed diphtheria bacilli and spindles of very irregular size (medium and short), some with ragged outlines. In the same specimen, in another field, club-shaped and other typical forms of diphtheria bacilli, streptococci, and staphylococci were seen. X 1000.

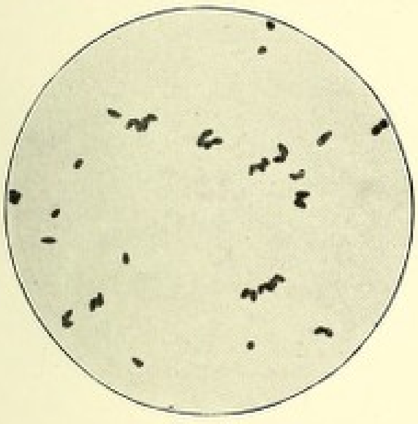

FIG. 6.

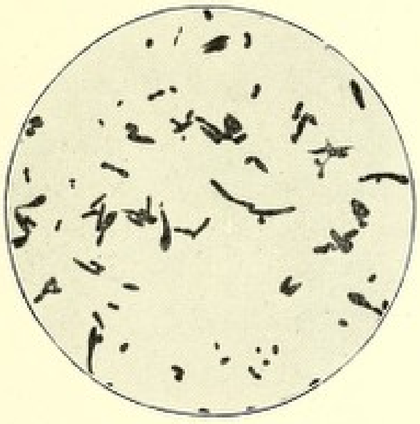

FIG. 7.

Fig. 6.—Photograph of specimen from Cultivation No. 1198. Short bacilli and a few single cocci. Taken from the throat of a case of diphtheria in a late stage of disease. These are in form indistinguishable from Hoffman's bacilli, except that they appear to be slightly more curved. X 1000.

Fig. 7.—Photograph of specimen from Cultivation No. 1729. Long and club-shaped diphtheria bacilli, with a number of medium and short forms; single cocci and diplococci also seen in this specimen. X 1000.

FIG. 8.

FIG. 9.

Fig. 8.—Photograph of specimen made from Cultivation No. 687. Long and club-shaped diphtheria bacilli; cocci, single, in pairs, and in short chains (streptococci). Very characteristic appearance. Some of the thin rods are very imperfectly stained; they, like the club-shaped and other well-stained bacilli, are probably diphtheria bacilli. X 1000.

Fig 9.—Photograph of specimen from Cultivation No. 809. This cultivation was made from a very foul throat. Various forms of organisms, some of which, imperfectly stained, may be diphtheria bacilli. Streptococci are numerous, as are also single, rounded, and oval cocci. The long pointed rods do not resemble diphtheria bacilli; but long, short, clubbed, and irregular forms of diphtheria bacilli were found in another cultivation taken from this case. X 1000.

PLATE III.

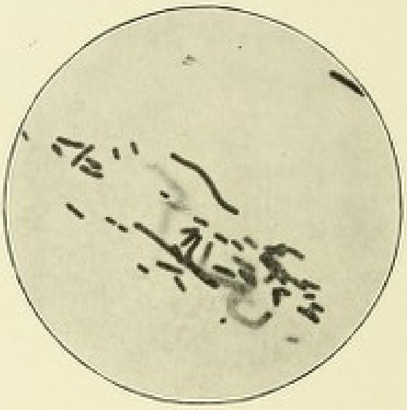

FIG. 10.

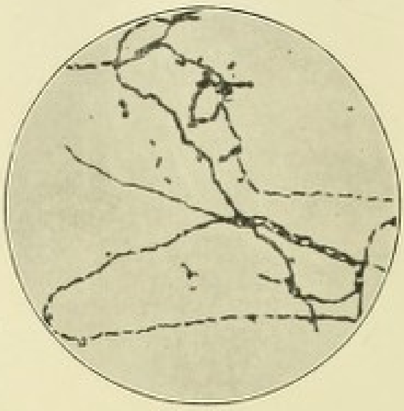

FIG. 11.

Fig. 10.—Photograph of specimen from Cultivation No. 407. Leptothrix rods and torula well seen. No diphtheria bacilli were found in this case. The rods were longer and thicker, and corresponded somewhat with the description given of Müller's bacillus. X 1000.

Fig. 11.—Photograph of specimen from Cultivation No. 2296. An almost pure culture of a spirillum which was grown on gelatine. Torula and streptococcus were also found in this case, but no diphtheria bacilli. X 1000.

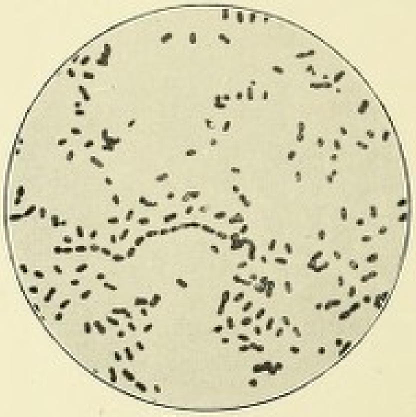

FIG. 12.

FIG. 13.

Fig. 12.—Photograph of specimen from Cultivation No. 1261. Chains of oval cocci and a few single rounded cocci were seen in this preparation, but no diphtheria bacilli were found in any of the cultivations made. X 1000.

Fig. 13.—Photograph of specimen from Cultivation No. 1376. Streptococci, rounded and oval, with yeast cells, but no diphtheria bacilli. X 750.

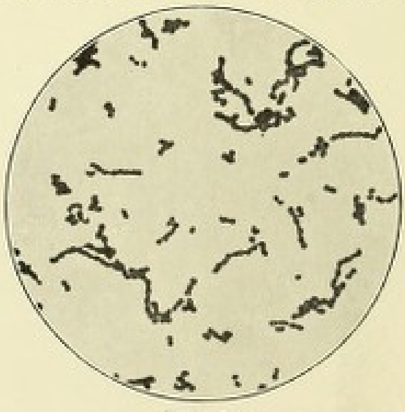

FIG. 14.

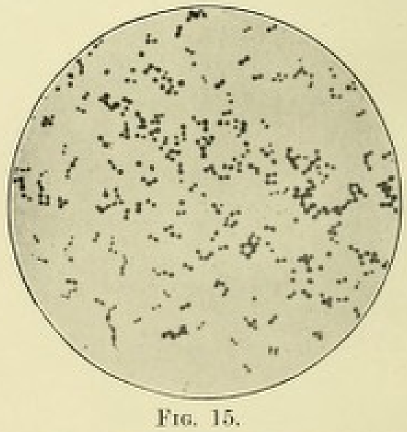

FIG. 15.

Fig. 14.—Photograph of specimen from Cultivation No. 2487. Streptococci from a case in which only a few long ragged spindles and spirals were found, but which was diagnosed as a case of diphtheria. X 1000.

Fig. 15.—Photograph of specimen from Cultivation No. 2454. Staphylococci and streptococci from a case of simple angina. X 1000.

All the specimens 4 to 15 were stained by Gram's method.

For these, a selection from a large collection of beautiful Microphotographs, I am indebted to my friend, Mr. ANDREW PRINGLE, F.R.M.S.

In virulent cases the wedge-shaped forms of the first group have often been observed, sometimes two wedges placed base to base forming a spindle; whilst the short ovoid forms are comparatively few in number. In milder cases, on the other hand, short ovoid forms are more numerous; and in convalescent cases they may be the only form found.

The short ovoid bacillus.

It will be pointed out that these short ovoid forms, especially those in which the staining extends throughout the bacillus, are associated with a very low death-rate. These organisms are usually arranged in the "battalion" form, and are often met with in almost pure culture. They correspond to what is usually known as the pseudo-diphtheria bacillus, and must be sharply distinguished from the very virulent short, striped, ovoid, wedge-shaped and short spindle-shaped bacilli that are found especially in the fresh broth cultures, and have been mentioned as belonging to the first group.

Characteristic grouping.

In a preparation made from a typical and pure culture the diphtheria bacilli exhibit a characteristic angled or interlacing arrangement, and as no amount of shaking will break up this arrangement altogether, it has been suggested (though of this there is little further evidence) that there is some unstained and invisible interbacillary substance holding the various bacilli of a group together. The bacilli may occur singly, but are more usually arranged in groups of two, three, and four—sometimes, though not often, more—lying parallel side by side or at a more or less open angle with each other, or even, in the longer forms, across one another like an "X;" these groups, again, lying at an angle with a single bacillus, or with another similar group, or forming a group with interlacing ends; sometimes two bacilli are placed end to end, but always at a more or less open angle with each other, resembling a circumflex accent, or an L or a V, very rarely in the same straight line with each other; indeed, it appears to be one of the characteristic features of the typical diphtheria bacilli that they *never* form even moderately long chains. The bacilli are often thrown into interlacing irregular heaps, resembling—especially the combinations of circumflex and several parallel rods—to use the apt simile of Dr. Louis Martin, groups of cuneiform characters. They have also been compared to Chinese letters or characters. In the longer forms this arrangement often assumes a peculiar crossing or rosette-like grouping, due to the interlacing of the ends of the bacilli. Where the short, stout form predominates the above characteristic grouping is not so markedly conspicuous, but it can still be found in a more or less modified form with a greater tendency to the formation of series of parallel bacilli and with numerous bacilli in each of the series. The presence of other organisms in mixed culture always interferes with the characteristic arrangement, though traces of it may almost invariably be made out.

True and pseudo-diphtheria bacilli.

According to Escherich, the paucity of interlocking or interlacing, and the greater predominance of parallel series, points to the presence of the pseudo-diphtheria bacillus. My experience certainly coincides with this observation. Escherich is inclined to agree with Neisser that the peculiar crossing or interlacing of the longer forms, and particularly of the club-shaped rods, is to be referred to a formation of new bacilli by the outgrowth of the chromatic granules—the "Ernst'schen Punkte"—in a direction at right angles to the parent bacillus. Shattock independently came to the same conclusion.

Escherich does not go so far as does Dr. Louis Martin in affirming that the "enchevêtrés" bacilli are always genuine diphtheria bacilli, whilst the parallel arrangement is characteristic of the pseudo-diphtheria bacillus. He is unable to draw such a hard-and-fast line, but he admits that the scarcity of club forms and the predominance of parallel grouping in a blood serum culture indicates that the organism under examination is a pseudo-diphtheria bacillus, and not the true Klebs Loeffler's bacillus. He lays stress, however, on the appearances of a culture on agar, on behaviour in broth, and, of course, on the positive or negative result of animal inoculation experiments, as being more decisive than microscopical examination alone. Our experience is that in the great majority of cases the appearances of cultures and of microscopic examination are quite sufficient for the determination of the presence of the true Klebs Loeffler bacillus, but that in a few doubtful cases every method that will afford any help is gladly utilised, sometimes, unfortunately, with incomplete success.

It is unnecessary to describe in detail the various forms of the bacilli that have been from time to time included under the term "pseudo-diphtheria bacillus," as they practically take all the forms described as Loeffler's bacillus—with, perhaps, a predominance of certain forms of grouping, which can only be considered relative, however—and have been referred to when describing Loeffler's bacillus. As already mentioned, I have found that with the short, stout form of the genuine bacillus, occurring so often in convalescent cases, there is a very marked tendency to an arrangement into parallel series, and this must be taken as being characteristic of the less virulent diphtheria bacilli, whether they are to be spoken of as pseudo-diphtheria bacilli or not.

Hoffman's bacillus.

I have not used the term "Hoffman's bacillus," as, owing to the great differences of opinion that have arisen as to the exact forms that are to be included under that term, there appears to be very little agreement as to what Hoffman's bacillus really is.

SCOPE OF THE REPORT.

The Report deals with the bacteriological examinations made during a period of exactly two years, but owing to overlapping, and in order to bring within the scope of the Report as many completed cases as possible, a history of every completed case of which any examination was made during this period has been included; with the result that a few cases appear as having been admitted to hospital during the year 1894. These, however, were sent up for examination during 1895, and were discharged or died during that year. On the other hand, a number of cases, specimens from which were examined in 1896, were not discharged until the early months of 1897. The cases under consideration, therefore, have been divided into three groups—cases admitted during 1894, cases admitted during 1895, and cases admitted during 1896. By this classification it is possible to give a series of completed cases, and all the statistics that follow are based on such completed cases only.

Number of cultivations.

During the period under review 27,128 cultivations were examined. Of these 24,933 have been traced and assigned to 12,172 patients.

It will be observed, on comparing the total number of examinations with the examinations made of completed cases, that there exists a considerable discrepancy—*i.e.*, there were 2,195 examinations made which do not come within the purview of this Report. Of this number 295 specimens were notified as having been taken from the throats of members of the staff of one or other hospitals, leaving 1,899 examinations to be accounted for. On further analysis and enquiry, it has been found that a considerable number of examinations of which no trace can be found in the ordinary case-sheets were those of staff patients, although they were not so notified. A large number of the specimens still unaccounted for were from cases from which negative results were obtained—scarlatina, mild cases of tonsillitis, and cases of other specific infective fevers, notes of which it was not deemed necessary by the physician in charge to send to the Laboratories. A few of the untraced specimens gave positive results—*i.e.*, diphtheria bacilli were found in the cultures—but as the tubes in which they were contained were unlabelled when they came to the Laboratories, it was impossible to trace the patient, and in certain cases even the hospital from which the culture came.

Staff cases.

Recording and Preparation of Statistics.

It will at once be evident that the classification of such an enormous amount of material so rapidly accumulated was a matter of very considerable difficulty. The mere statement of undigested facts in the record book could, of course, be of comparatively little value, and it became necessary to devise some plan whereby a grouping of statistics might be facilitated.

Record sheets.

To this end, a somewhat elaborate sheet, of which the following (p. 11) is a copy, was drawn up, and on it the various data were indicated by putting in marks in the lines opposite the number of the case and in the columns under the various headings. In this way it was possible with clerical assistance to get out most of the necessary data, and also to obtain them in an accessible form, and one convenient for purposes of grouping.

From these sheets the whole of the results obtained have been compiled; whilst by means of a second sheet (p. 77) on which the facts concerning the history and treatment of a case could be entered, it was possible easily to compare the bacteriological and clinical features of any or all of the cases.

Bacteriological data only given here.

Here are dealt with only the results collected on the first form; the clinical features will be considered later, especially in relation to the results of treatment with antitoxin supplied from these Laboratories. An attempt has been made merely to give the outstanding features that characterise the cases in mass, but all the accumulated data have been preserved, so that should it be necessary at any future time to refer to them for any special information, such information as it has been possible to collect from the various hospitals will still be available.

Statistics.

In Table I. is given the number of cases admitted to the various hospitals during the several years, and also the total number of cases (of which I have been able to obtain records) from which specimens were taken and cultures made and examined.

In the Gore Farm and Northern Hospital columns only those cases in which there was a primary attack of diphtheria, or a distinct relapse in these hospitals, are included. Convalescent cases sent to these hospitals from the others are counted as coming from, and classified in the columns relating to, the hospitals to which these cases were originally admitted.

In Table II. are given the detailed results of the examinations for diphtheria bacilli of cases admitted in the three years 1894, 1895, and 1896, and dead or discharged up to the present date, cultivations from which were made during the years 1895 and 1896. The numbers from each hospital include the convalescent cases transferred to the Northern and Gore Farm Hospitals. In these two hospitals are counted only cases that suffered from a relapse, or in which there was an outbreak of diphtheria following convalesence from some other disease.

Separate groups of figures are here given for each year for purposes of comparison, but it will be noted that the percentage of notified cases in which diphtheria bacilli were found is, approximately, the same in each year in each hospital. In the North-Eastern Hospital the percentage is, as would be expected, low, as here we are dealing principally with cases of scarlatina.

In the North-Western, South-Western, Brook, and the two Convalescent Hospitals, the percentage of notified or diagnosed cases in which diphtheria bacilli were found in the throat is notably high. It is interesting to observe how regularly these figures come out, and how closely in each year they approximate to the average of the two years. Whether the differences are due to differences in the type of the disease, to the greater prevalence of severe non-diphtheritic forms of sore throat in certain districts, or to different systems of notification or admission in different districts, does not at first sight appear, but the constant and regular proportions are worthy of note in connection with the distribution of diphtheria in the various districts served by the hospitals under the Board.

Cases in which bacteriological examination gave no assistance.

In Table III. is given the number of cases examined in which diphtheria bacilli were found, with statistics as to the distribution of the "occurrence" of diphtheria bacilli in the course of the various examinations made. It will be noted that of the cases in 1894, 45 in number, the first examination was in each case considered to be satisfactory. In 1895 29 cases out of 5,295 were considered to be unsatisfactory from the first, and in 1896 39 cases out of

Copy of Sheet on which Data concerning "Swabs" and Cultures were entered for the purpose of facilitating the collection and preparation of Statistics.

MICROSCOPIC EXAMINATION OF "SWAB."

Number of Specimen.	Naked-eye Diagnosis.	Forms of Diphtheria Bacilli.						Forms like Diphtheria Bacilli.				Torulæ, &c.			Bacilli unlike Diphtheria Bacilli.						Streptococci.				Staphylococci.		
		Long.	Short.	Club.	Wedge-shaped.	Spindles.	Unevenly Stained.	Thin Rods, well Stained.	Commas.	Spindles.	Oval Torula.	Round Torula.	Yeast (large cells).	Sarcina.	Thin faint Threads.	Leptothrix.	Thick Rods, square ends.	Thick Rods, round ends.	Thick crenated Rods.	Spirilla.	Streptococci.	Chains of Diplococci.	Oval Cocci and Streptococci.	Small Streptococci.	Staphylococci.	Faintly stained and small Staph.	Brisou Coccus.
+12210 ...	–	1	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
+12677 ...	–	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
+12993 ...	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
[2]+ 9810 ...	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–
+12987 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
[2]+11251 ...	–	1	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
+13217 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
[3]− 7227 ...	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
− 7593 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
+13270 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
[4]+ 9010 ...	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
−13205 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
+11056 ...	–	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
[4]+12865 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
−13410 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
+11397 ...	–	1	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
[4]−13414 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
+ 7928	–	1	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
+12101 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
+13026 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
+13412 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

MICROSCOPIC EXAMINATION OF CULTURE.

Number of Specimen.	Forms of Diphtheria Bacilli.							Forms like Diphtheria Bacilli.				Torulæ, &c.		Bacilli unlike Diphtheria Bacilli		Streptococci.						Staphylococci.				REMARKS.
	Long.	Short.	Club.	Wedge-shaped.	Spindles.	Unevenly Stained.	Faintly Stained.	Thin Rods, well Stained.	Thin Rods, faintly Stained.	Commas and Spirals.	Oval Torula.	Round Torula.	Yeast (large cells).	Thin Threads.	Thick Rods.	Streptococci.	Chains of Diplococci.	Small Streptococci.	Oval Streptococci.	Faint Streptococci.	Oval Chains and Diplococci, special.	Staphylococci.	Small Staphylococci.	Faint Stained Staphylococci.	Brisou Coccus.	
+12210 ...	1	1	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	
+12677 ...	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	D. S.[1]
+12993 ...	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
[2]+ 9810 ...	1	1	1	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	
+12987 ...	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	
[2]+11251 ...	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
+13217 ...	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	
[3]− 7227 ...	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	
− 7593 ...	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	1	–	–	–	
+13270 ...	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	
[4]+ 9010 ...	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
−13205 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	
+11056 ...	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
[4]+12865 ...	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	
−13410 ...	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	1	–	–	–	
+11397 ...	1	1	1	–	1	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	
[4]−13414 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	
+ 7928	1	1	–	–	1	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	
+12101 ...	1	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	
+13026 ...	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
+13412 ...	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	

1. D.S = Diphtheria and Scarlet Fever.
2. Here two examinations were made; both were positive, and the patient was discharged without further examination.
3. Here three examinations were made; the two first were negative, the final one positive.
4. First examination positive, last negative.
5. Four examinations, all positive, and patient discharged without further examination.

TABLE I.—Showing Total Number of Cases certified as suffering from Diphtheria or presenting symptoms characteristic of that disease at some time during their stay in Hospital, that have been examined during the whole period that Bacteriological Examinations have been carried out under the instruction of the Board.

Name of Hospital.	Year 1894.	Year 1895.	Year 1896.	Total Cases.
Fountain	11	930	1,301	2,242
Western	..	838	1,171	2,009
Eastern	5	1,030	1,049	2,084
South-Eastern	29	734	974	1,737
South-Western...	...	559	615	1,174
North-Western	...	794	916	1,710
North-Eastern	...	157	108	265
Brook	...	...	278	278
Northern	...	253	319	572
Gore Farm	...	...	101	101
Total	45	5,295	6,832	12,172

TABLE II.—Showing Number of Cases examined, and the Number and Percentages of Cases in which Diphtheria Bacilli were found.

1894.

Hospital	Number of Examinations of Cases in which Diphtheria bacilli were found.	Number of Examinations of Cases in which no Diphtheria bacilli were found.	Total Examinations.	Percentage of Cases in which Diphtheria bacilli were found.
Fountain	11	...	11	100·0
Eastern	5	...	5	100·0
South-Eastern	29	..	29	100·0
Total	45	...	45	100·0

1895.

Hospital	Number of Examinations of Cases in which Diphtheria bacilli were found.	Number of Examinations of Cases in which no Diphtheria bacilli were found.	Total Examinations.	Percentage of Cases in which Diphtheria bacilli were found.
Fountain	687	243	930	73·87
Western	601	237	838	71·71
Eastern	708	322	1,030	68·73
South-Eastern	514	220	734	70·027
South-Western...	444	115	559	79·42
North-Western	621	173	794	78·21
North-Eastern...	58	99	157	36·94
Northern	191	62	253	75·49
Total	3,824	1,471	5,295	72·22

1896.

Hospital	Number of Examinations of Cases in which Diphtheria bacilli were found.	Number of Examinations of Cases in which no Diphtheria bacilli were found.	Total Examinations.	Percentage of Cases in which Diphtheria bacilli were found.
Fountain	944	357	1,301	72·55
Western...	884	287	1,171	75·49
Eastern	725	324	1,049	69·11
South-Eastern	700	274	974	71·86
South-Western	481	134	615	78·21
North-Western	731	185	916	79·803
North-Eastern	47	61	108	43·51
Brook	224	54	278	80·57
Northern	251	68	319	78·68
Gore Farm	81	20	101	80·19
Total	5,068	1,764	6,832	74·18

Totals for Three Years, 1894, 1895, and 1896.

Hospital	Number of Examinations of Cases in which Diphtheria bacilli were found.	Number of Examinations of Cases in which no Diphtheria bacilli were found.	Total Examinations.	Percentage of Cases in which Diphtheria bacilli were found.
Fountain	1,642	600	2,242	73·23
Western	1,485	524	2,009	73·91
Eastern	1,438	646	2,084	69·001
South-Eastern	1,243	494	1,737	71·56
South-Western	925	249	1,174	78·79
North-Western	1,352	358	1,710	79·06
North-Eastern	105	160	265	39·62
Brook	224	54	278	80·57
Northern	442	130	572	77·27
Gore Farm	81	20	101	80·19
Total	8,937	3,235	12,172	73·42

6,832; or a total of 68 out of 12,172—0·55 per cent. Although such a small number of cases in which diphtheria bacilli were ultimately found were, from a bacteriological point of view, unsatisfactory at the first bacteriological examination, it must be remembered that a certain proportion of the cases were, from the clinical point of view, undoubtedly "diphtheria"—that is, they ran a very severe course, or were followed by paralysis of some form or other, even when it had been impossible after repeated examination (in most cases owing to the late period of the disease at which the cultivation had been made) to isolate and examine the diphtheria bacillus. Including those cases unsatisfactory from the bacteriological point of view, and those that from the clinical standpoint were undoubtedly diphtheria but came under bacteriological examination at too late a period, we have about five per cent. of the cases in which the bacteriological examination failed to assist in the diagnosis of diphtheria.*

Table III.—Showing Cases in which more than one Examination was made; the details concerning the results of these Examinations are given at the head of each column.

Hospital.	Cases in which Diphtheria bacilli were found at the last Examination made.	Cases in which no Diphtheria bacilli were found at the last Examination made.	Cases in which the first Examination was not satisfactory.	Cases (with percentage) in which no Diphtheria bacilli were found at the first Examination, but were afterwards found.		Cases in which a negative diagnosis was sent to the Hospital, preceded and succeeded by a positive diagnosis (1).	Cases in which a positive diagnosis was sent to the Hospital, preceded and succeeded by a negative diagnosis (1).	Total Cases Examined on more than one occasion.
1894.								
Fountain	8	3	...	...	...	...	...	5
Eastern	3	2	...	...	...	...	...	3
South-Eastern	14	15	...	4	13·7	1	2	23
Total	25	20	...	4	8·8	1	2	31
1895.								
Fountain	238	449	9	103	14·9	20	7	551
Western	166	435	5	31	5·1	1	16	452
Eastern	314	394	4	51	7·2	...	12	504
South-Eastern	198	316	..	31	6·03	6	11	354
South-Western	424	20	2	12	2·7	...	2	32
North-Western	213	408	5	56	9·01	1	24	443
North-Eastern	36	22	2	4	6·8	...	1	42
Northern	5	186	2	5	2·6	1	...	186
Total	1,594	2,230	29	293	7·6	29	73	2,564
1896.								
Fountain	442	502	11	75	7·9	14	...	649
Western	258	626	5	46	5·2	2	12	664
Eastern	373	352	7	61	8·4	3	12	516
South-Eastern	371	329	3	48	6·8	10	13	450
South-Western	433	48	2	16	3·3	...	1	75
North-Western	318	413	5	45	6·1	...	16	468
North-Eastern	46	1	2	1	2·1	...	...	7
Brook	133	91	...	8	3·5	4	...	120
Northern	33	218	2	2	0·7	1	...	237
Gore Farm...	26	55	2	8	9·8	2	2	70
Total	2,433	2,635	39	310	6·1	36	56	3,256
Total Cases for 1894, 1895, and 1896.								
Fountain	688	954	20	178	10·8	34	7	1,205
Western	424	1,061	10	77	5·1	3	28	1,116
Eastern	690	748	11	112	7·7	3	24	1,023
South-Eastern	583	660	3	83	6·6	17	26	827
South-Western	857	68	4	28	3·02	...	3	107
North-Western	531	821	10	101	7·4	1	40	911
North-Eastern	82	23	4	5	4·7	...	1	49
Brook	133	91	...	8	3·5	4	...	120
Northern	38	404	4	7	1·5	2	...	423
Gore Farm...	26	55	2	8	9·8	2	2	70
To'al	4,052	4,885	68	607	6·7	66	131	5,851

(1) Here negative diagnosis = Diphtheria bacilli not found.
Positive diagnosis = Diphtheria bacilli found.

* See Reports of the Medical Superintendents of the Hospitals under the Board for 1895 and 1896.

Diphtheria bacilli found at last examination.

On reference to TABLES I. and III. it will be noted that out of 12,172 cases, diphtheria bacilli were found at the last examination that was made in no fewer than 4,052, or 33·28 per cent. of the whole. It is interesting to compare the different years in this respect. In 1894, 25 cases out of 45, or 55·5 per cent.; in 1895, 1,594 out of 5,295, or 30·1 per cent.; in 1896, 2,433 out of 6,832, or 35·6 per cent., still had diphtheria bacilli in the throat when the last examination was made. Of course it cannot be assumed that all these cases had bacilli in the throat when they were discharged, as at the South-Western Hospital, for example, no second cultivation was, as a rule, sent for examination; but in a certain proportion of cases there can be no doubt that the patients when discharged had in their throats diphtheria bacilli which, under favourable conditions, might be transmitted from the patient to those with whom he or she afterwards might come in contact. Bearing in mind the continuance of diphtheria in London, and the recognised fact that diphtheria bacilli can be readily transmitted by patients who are apparently no longer suffering from the effects of the disease, to those who have weak or ulcerated throats, I am strongly of the opinion that more attention should be paid to the continued isolation of diphtheria patients in whose throats even slightly virulent diphtheria bacilli still remain. It would, in many cases, necessarily involve detention of the patient in hospital, or isolation over very considerable periods; but it must be remembered that it is just these patients that should remain so isolated or in hospital for a long time that are capable of maintaining in their throats the active agent of infection, and who are, therefore, sources of very great danger to the community, and especially to the children with whom they may come in contact at schools, at home, or during play hours. Another interesting column in this table is that which relates to the cases in which no diphtheria bacilli were found at the first examination, although on subsequent examination they were undoubtedly found. In these cases it must be accepted that the clinical diagnosis could not, at first, be in any way corroborated by the bacteriological examination; but it must also be borne in mind that had no second examination been made, and had the cases of diphtheria been of a very mild type, the cases might have been returned as non-diphtheritic in character, so that we have here additional evidence of the necessity for a second examination in all cases in which there is any doubt at all in the mind either of the clinician or of the bacteriologist. In the two following columns we have evidence that under certain conditions the diphtheria bacillus, though undoubtedly present, may, owing to some reason or other (imperfect swabbing out of the throat, the use of antiseptics, or the localisation of the bacilli), be passed over. These cases are considerably fewer in 1896 (92, or 1·34 per cent.) than in 1895 (102, or 1·92 per cent.); so that by increased practice in taking the swabs, improved technique, both in preparation of media and microscopic specimens, and further experience in the examination of the specimens, this source of error may ultimately be reduced to a minimum.

Isolation of patients until bacilli disappear.

All doubtful cases to be re-examined

There still remains a group of cases which, from the bacteriological point of view, is unsatisfactory, as its presence in the table indicates the possibility of overlooking diphtheria bacilli at the first examination, even when the examination itself appears to be satisfactory. This column is headed: "Cases in which no diphtheria bacilli were found at the first examination." As the bacilli were ultimately found, it is evident that in these cases the diphtheria bacillus, though present, was undoubtedly overlooked, except in a very small proportion of cases where infection may have taken place at a period between the two examinations. Leaving 1894 out of account, where the percentage, 8·8, is on a very small number of cases, we find that in 1895 there were 293 cases, or 7·6 per cent. of the whole of the cases in which diphtheria bacilli were found, which came under this heading. In 1896 there were 310 cases, or 6·1 per cent.; so that altogether we have a percentage for the three years of 6·7. As these cases were examined on subsequent occasions the error in diagnosis was, of course, ultimately corrected. Here again we have an indication of the importance of making more than a single examination in all cases in which there is any doubt at all, and especially in those cases in which a negative bacteriological diagnosis has, in the first instance, been given.

This brings us to the consideration of the cases in which diphtheria bacilli were present over a long period, as evidenced by numerous examinations.

Persistence of diphtheria bacilli in throat.

In TABLE IV. is given the number of examinations of the different cases in which diphtheria bacilli were found. In the cases admitted in 1894 none of the specimens were examined more than seven times. In 1895 a few of the specimens were examined much more frequently, three of the cases being examined, one on the 14th, one on the 15th, and one on the 16th occasion respectively, whilst a considerable number were examined from 6 to 13 times, the diphtheria bacillus being found on each occasion. In 1896, when the importance of sending out patients with perfectly clean (as far as the diphtheria bacilli are concerned) throats was evidently becoming more fully recognised, one patient was examined no fewer than 22 times, one 21 times, two 20 times, one 19 times, three 18 times, and a considerable number between 6 and 16 times. It is evident from these figures that some of the cases that were sent out without a second examination may have retained their power of infecting those with whom they might come in contact for very prolonged periods; it will, indeed, be noted that one or two of the cases remained in hospital for periods of over six months before they were considered to be free from danger from the bacteriological point of view. Although these tables tell their own tale, I may be allowed to draw special attention to the large number of cases in which the diphtheria bacilli persist beyond the first (65·47 per cent.), second (30·78 per cent.), and third (17·07 per cent.) examinations. The indications for repeated examinations are as marked in this table as they are in the preceding tables.

In the last column is given the average number of examinations made in each case. It will be observed that in the Northern and Gore Farm Hospital cases the average number of examinations is very high—3·4 and 3·5 respectively. This average corresponds to the large percentage of notified cases in which diphtheria bacilli were found; whilst in the other

TABLE IV.—Cases which were examined on one or more occasions and in which Diphtheria bacilli were found present, in some cases for prolonged periods. The total cases examined and the number and percentage of examinations made in each case are also given.

HOSPITAL.	Cases in which were Examined on 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22 occasions.	Total Cases Examined.	Total Specimens Examined.	Average Number of Examinations per case.
1894.																									
Fountain	6	3	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	19	1·7
Eastern	2	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	8	1·6
South-Eastern	6	12	5	2	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29	77	2·6
Total	14	18	6	3	2	...	2	...	...		...	...		...	...	...	...	...	...	...	...	...	45	104	2·3
1895.																									
Fountain	136	256	119	63	42	29	17	16	2	4	1	...	1	...	1	...	...	...	...	...	...	...	687	1,985	2·8
Western	149	236	102	42	22	13	12	5	5	6	5	2	1	...	...	1	...	...	...	...	...	...	601	1,620	2·6
Eastern	204	371	77	34	12	5	1	1	1	1	...	...	...	1	...	...	...	...	...	...	...	...	708	1,451	2·04
South-Eastern	160	170	87	47	21	12	10	4	1	1	...	1	...	...	...	...	...	...	...	...	...	...	514	1,259	2·4
South-Western	412	23	5	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	444	490	1·1
North-Western	178	233	119	50	21	9	5	1	1	3	...	1	...	...	...	...	...	...	...	...	...	...	621	1,454	2·3
North-Eastern	16	23	15	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	58	126	2·1
Northern	5	107	22	22	16	7	6	2	4	...	...	...	...	...	...	...	...	...	...	...	...	...	191	589	3·08
Total	1,260	1,419	546	263	136	76	51	29	14	15	6	4	2	1	1	1	...	...	...	...	...	...	3,824	8,974	2·3
1896.																									
Fountain	295	342	149	73	40	18	12	6	3	2	1	1	1	1	...	...	...	...	...	...	...	...	944	2,255	2·3
Western	220	288	139	89	53	24	16	13	13	7	8	6	3	1	1	2	...	1	...	...	...	...	884	2,659	3·007
Eastern	209	320	87	36	20	13	7	4	6	3	1	5	1	1	1	...	...	...	1	...	1	...	725	1,768	2·4
South-Eastern	250	200	111	50	22	19	11	7	8	7	3	4	1	...	2	1	...	2	...	1	...	1	700	1,900	2·7
South-Western	406	40	13	8	6	3	...	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	481	649	1·3
North-Western	263	259	95	51	27	13	12	6	2	2	...	1	...	...	...	...	...	...	...	...	...	...	731	1,665	2·2
North-Eastern	40	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	47	54	1·1
Brook	104	62	34	13	4	6	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	224	446	1·9
Northern	14	111	35	30	21	6	12	2	3	4	6	...	3	...	2	1	...	...	...	1	...	...	251	940	3·7
Gore Farm	11	25	10	10	16	2	2	3	1	...	...	...	...	1	...	...	...	...	...	...	...	...	81	284	3·5
Total	1,812	1,663	673	360	209	104	72	45	36	27	19	17	9	4	6	4	...	3	1	2	1	1	5,068	12,620	2·4
TOTAL CASES FOR 1894, 1895, AND 1896.																									
Fountain	437	601	269	137	82	47	29	22	5	6	2	1	2	1	1	...	...	...	...	...	...	...	1,642	4,259	2·5
Western	369	524	241	131	75	37	28	18	18	13	13	8	4	1	1	3	...	1	...	...	...	...	1,485	4 279	2·8
Eastern	415	703	164	70	32	18	8	5	7	4	1	5	1	2	1	...	...	...	1	...	1	...	1,438	3 227	2·2
South-Eastern	416	382	203	99	45	31	23	11	9	8	3	5	1	...	2	1	...	2	...	1	...	1	1,243	3,236	2·6
South-Western	818	63	18	11	7	3	...	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	925	1,139	1·2
North-Western	441	492	214	101	48	22	17	7	3	5	...	2	...	...	...	...	...	...	...	...	...	...	1,352	3,119	2·3
North-Eastern	56	30	15	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	105	180	1·7
Brook	104	62	34	13	4	6	...	1	...	...		...	...	...	...	...	...	...	...	...	...	...	224	446	1·9
Northern	19	218	57	52	37	13	18	4	7	4	6	...	3	...	2	1	...	...	...	1	...	...	442	1,529	3·4
Gore Farm	11	25	10	10	16	2	2	3	1	...	...	...		1	...	...		...	...	...	...	...	81	284	3·5
Total	3,086	3,100	1,225	626	347	180	125	74	50	42	25	21	11	5	7	5	...	3	1	2	1	1	8,937	21,698	2·4

hospitals—in which the average number of examinations is also high, leaving out of consideration the South-Western and North-Eastern Hospitals, in which the conditions were somewhat exceptional—the number of examinations corresponds fairly accurately with the percentage of cases in which diphtheria bacilli were found. That it does not hold good throughout is additional evidence that the factors already mentioned as determining the percentage of cases in which bacilli were present to the whole of the cases examined, play a by no means unimportant part.

Importance of study of bacteriology.

Since attention was first turned to the bacteriology of diphtheria and allied conditions there have been great differences of opinion expressed as to the influence of the different forms of diphtheria bacillus when present alone, or in combination with other micro-organisms, such as the streptococci and the staphylococci. It is not advisable here to enter into any prolonged discussion on this question, but it may be well to bring together the statistics bearing on this point, in order that we may see at a glance which organisms are associated with the more fatal classes of cases, and which appear to exert the least deleterious influence by their presence. On referring to TABLE V. we find that, as regards the diphtheria bacillus alone, the highest mortality occurs in those cases in which we have practically pure cultures of the long form—21·4 per cent. But wherever the long bacillus is present the mortality is high, ranging from 20·1 per cent. (long and short bacilli only) to 18·6 (long, short, and irregular), to as low as 14·6 (long and irregular forms).

Mixed infections most fatal.

When, however, we come to deal with the mixed infections already referred to, we find that, contrary to what is usually laid down, the most fatal form is that in which the complicating organism belongs to the staphylococcus group, the mortality under these conditions varying from 32·5 to 27·9 per cent. The streptococcus infection, along with the long diphtheria bacillus alone, or in combination with the other forms, is also, of course, comparatively fatal, the percentage mortality then ranging from 24·7 to 17·3. A mixture of the streptococcus and staphylococcus, plus the long bacillus alone, or the long bacillus associated with the irregular forms, is again somewhat higher, the range in the percentage mortality here being between 28·3 and 19·3. It will thus be seen that the mixed infections are always slightly, and in some cases considerably, more fatal than are the simple infections with the long diphtheria bacillus.

The effect of streptococcus and staphylococcus "poisoning" in increasing the severity of the attack comes out, however, much more prominently when we come to deal with the short diphtheria bacillus and with mixtures of the short and irregular forms.

Short bacillus (pseudo-form?) not virulent when present alone.

From a study of the statistics of the short bacillus as they appear in this table, it would seem that, in many cases, at any rate, the short bacillus is really a pseudo-form, or has such slight virulence that it usually gives rise to a very mild attack of the disease. At the same time it must be borne in mind that even with the presence of the short bacillus alone there were a few fatal cases in which most of the characteristic symptoms of diphtheria were present. For this reason, if for no other, it is, at present, impossible to recommend that cases in which only the short form can be found should be discharged as cured and free from infection. We certainly are not, with our present knowledge, satisfied that such cases do not contain specific infective material, or that the throats in which they are found are not dangerous centres of infection. It will be found, however, on referring to the table, that where the short bacillus alone was found in the throat of cases that were certified as suffering from diphtheria (148 in number), there were 5 deaths, giving a percentage mortality of only 3·3 per cent.

Short bacillus important when mixed with pyogenetic organisms.

Even when these were associated with irregular forms—(32 cases: 3 deaths, 9·3 mortality per cent.)—the mortality was still low. As soon, however, as the staphylococcus complicates matters the mortality rises to 11·9. It is also fairly high—10·4—when the streptococcus comes in, and 11·4 when a mixture of streptococcus and staphylococcus is the complicating element. The addition of the irregular forms to the short form, either with streptococcus or staphylococcus, or with the two in combination, again raises the percentage, the mortality in one case reaching 17·3 per cent. It is evident from all this that the gap between the long and the short bacillus in regard to the mortality is very considerable, but that, whatever may be the form of the diphtheria bacillus present, the mortality is always higher where there is any mixed infection.

Summary.

Summarising these results, it will be seen that in the two years during which the examinations were carried out there were 7,192 cases which, from a bacteriological point of view, were cases of true diphtheria, of which 1,526 died—a mortality of 21·2 per cent.

In TABLE VI. the whole of the cases in which there were pure cultures of diphtheria only are stated at 2,196, with 394 deaths, giving a percentage mortality of 17·9, or, deducting those in which there was the short form only, 18·9 per cent. The various forms of diphtheria bacillus, complicated with streptococci, were found in 1,370 cases. Amongst these there were 282 deaths, this giving a percentage mortality of 20·5, or without those cases in which the short forms only were found, 22·3 per cent. Diphtheria bacilli, plus staphylococci, were found in 1,748 cases, with 445 deaths, giving a percentage mortality of 25·4, or without those cases in which the bacilli were of the short form, 27·3 per cent. In those cases in which there was the combination of both streptococcus and staphylococcus with the various forms of bacilli, there were 405 deaths out of 1,878 cases, or 21·5 per cent.

"Pure cultures" and "mixtures."

Without those cases in which the short form only along with these two organisms (streptococcus and staphylococcus) were present, the death-rate rose to 23·6 per cent. In considering these statistics it must be remembered that only in a very small proportion of the cases were there absolutely pure cultures of a diphtheria bacillus, or mixtures of the diphtheria bacillus with streptococcus or staphylococcus only. As might be expected, the bacterial flora of the throat is usually an exceedingly rich one. In many cases, however, there was such a great predominance of certain groups of organisms that the others might practically be left out of account. Where there was a large preponderance of diphtheria bacilli, with only a few colonies of streptococci and

TABLE V.—Showing the number of cases of Diphtheria in which the various forms of Diphtheria bacilli, either alone or in combination with Streptococci or Staphylococci, or both, occurred in patients admitted to the various Hospitals during the years 1894, 1895, and 1896, with the percentage mortality for these three separate years, and for the whole period.

	1894. Fountain. Cases.	Fountain. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	Total. Cases.	Total. Deaths.	Mortality. Per cent.
Long Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci	...	...	...	...	...	...	...	...	0·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0
Short Diphtheria bacilli (alone)	...	...	...	...	3	...	3	...	0·0
Do. + Streptococci	...	...	...	...	5	...	5	...	0·0
Do. + Staphylococci	...	...	1	...	1	...	2	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	3	...	3	...	0·0
Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci	...	...	...	...	...	...	...	...	0·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0
Long, Short, and Irregular Diphtheria bacilli (alone)	...	...	...	...	1	...	1	...	0·0
Do. + Streptococci	...	...	...	...	4	...	4	...	0·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	1	...	1	...	0·0
Long and Short Diphtheria bacilli (alone)	1	...	...	...	1	...	2	...	0·0
Do. + Streptococci	2	...	...	...	4	...	6	...	0·0
Do. + Staphylococci	...	...	...	...	3	1	3	1	33·3
Do. + Streptococci and Staphylococci	1	1	...	...	1	...	2	1	50·0
Long and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci	...	...	...	...	...	...	...	...	0·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0
Short and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci	...	...	...	...	...	...	...	...	0·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0
	4	1	1	...	27	1	32	2	6·2

TABLE VI.—In which is given a résumé of the figures contained in Table V. The whole of the cases in which Diphtheria bacilli were present are given in the first line of each group of figures; then the cases in which the Short bacillus (alone, or along with Streptococci or Staphylococci, or both) was found, are given; and in the third line are the total cases minus those in which the Short bacillus (alone, *i.e.*, without the long or irregular forms) was met with.

	1894. Fountain. Cases.	Fountain. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	Total. Cases.	Total. Deaths.	Mortality. Per cent.
Various forms of Diphtheria bacilli (only)	1	...	...	...	5	...	6	...	0·0
Cases in which Short Diphtheria bacilli only are found	...	...	...	...	3	...	3	...	0·0
Total, less cases in which Short Diphtheria bacilli are found	1	...	...	...	2	...	3	...	0·0
Various forms of Diphtheria bacilli, + Streptococci	2	...	...	...	13	...	15	...	0·0
Cases in which Short Diphtheria bacilli are found	...	...	...	...	5	...	5	...	0·0
Total, less cases in which Short Diphtheria bacilli are found	2	...	...	...	8	...	10	...	0·0
Various forms of Diphtheria bacilli, + Staphylococci	...	...	1	...	4	1	5	1	20·0
Cases in which Short Diphtheria bacilli are found	...	...	1	...	1	...	2	...	0·0
Total, less cases in which Short Diphtheria bacilli are found	...	...	...	...	3	1	3	1	33·3
Various forms of Diphtheria bacilli, + Streptococci and Staphylococci	1	1	...	...	5	...	6	1	16·6
Cases in which Short Diphtheria bacilli are found	...	...	...	...	3	...	3	...	0·0
Total, less cases in which Short Diphtheria bacilli are found	1	1	...	...	2	...	3	1	33·3

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TABLE VII.—Showing the number of cases of Diphtheria with Scarlet Fever complications in which the various forms of Diphtheria bacilli, either alone or in combination with Streptococci or Staphylococci, or both, occurred in patients admitted to the various Hospitals during the years 1894, 1895, and 1896, with the percentage mortality for these single years, and for the whole period.

	1894. Fountain. Cases.	Fountain. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	Total. Cases.	Total. Deaths.	Mortality. Per cent.	1895. Total. Cases.	Total. Deaths.	Mortality. Per cent.	1896. Total. Cases.	Total. Deaths.	Mortality. Per cent.	Total. Cases.	Total. Deaths.	Mortality. Per cent.
Long Diphtheria bacilli	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	11	3	27·2	71	11	15·4
Do. + Streptococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	7	1	14·2	51	9	17·6
Do. + Staphylococci	1	...	...	...	...	...	1	...	0·0	[illegible]	[illegible]	[illegible]	15	1	6·6	64	8	12·5
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	9	1	11·1	47	7	14·8
Short Diphtheria bacilli	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	33	2	6·0	66	6	10·0
Do. + Streptococci	...	...	1	1	...	...	1	1	100·0	[illegible]	[illegible]	[illegible]	52	4	7·6	100	13	13·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	28	3	10·7	62	9	14·5
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	49	3	6·1	122	10	8·1
Irregular Diphtheria bacilli	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	6	...	0·0	9	...	0·0
Do. + Streptococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	11	1	9·09	12	1	8·3
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	5	2	40·0	5	2	40·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	15	2	13·3	18	3	16·6
Long, Short, and Irregular Diphtheria bacilli	...	...	...	...	1	...	1	...	0·0	[illegible]	[illegible]	[illegible]	175	9	5·1	219	12	4·05
Do. + Streptococci	...	...	...	...	1	...	1	...	0·0	[illegible]	[illegible]	[illegible]	93	14	15·05	108	15	13·8
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	55	12	21·8	68	15	22·05
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	58	7	12·1	73	12	16·4
Long and Short Diphtheria bacilli	2	...	...	...	...	...	2	...	0·0	[illegible]	[illegible]	[illegible]	45	3	13·4	102	11	10·7
Do. + Streptococci	...	...	1	...	...	...	1	...	0·0	[illegible]	[illegible]	[illegible]	64	7	10·9	121	16	13·2
Do. + Staphylococci	2	...	...	...	...	...	2	...	0·0	[illegible]	[illegible]	[illegible]	77	14	18·1	150	24	15·1
Do. + Streptococci and Staphylococci	1	...	2	...	...	...	3	...	0·0	[illegible]	[illegible]	[illegible]	109	13	11·9	204	26	12·4
Long and Irregular Diphtheria bacilli	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	11	2	18·1	19	3	15·7
Do. + Streptococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	7	...	0·0	11	...	0·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	5	1	20·0	8	2	25·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	10	2	20·0	22	3	13·6
Short and Irregular Diphtheria bacilli	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	10	1	10·0	11	2	18·1
Do. + Streptococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	10	1	10·0	10	1	10·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	2	...	0·0	2	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	0·0	[illegible]	[illegible]	[illegible]	8	...	0·0	9	...	0·0
Total	7	...	4	1	2	...	13	1	7·6	724	105	14·4	1,004	121	12·1	1,741	239	13·7

TABLE VIII.—Dealing with cases of Diphtheria in which there were Scarlet Fever complications, grouped in the same fashion as the simple cases of Diphtheria are arranged in Table VI.

	1894. Fountain. Cases.	Fountain. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	Total. Cases.	Total. Deaths.	Mortality. Per cent.	1896. Total. Cases.	Total. Deaths.	Mortality. Per cent.	Total. Cases.	Total. Deaths.	Mortality. Per cent.
Various forms of Diphtheria bacilli alone	2	...	...	...	1	...	3	...	0·0	312	26	8·3	471	45	9·6
Cases in which Short bacilli only are found	...	...	...	...	...	...	...	...	0·0	50	2	4·0	60	6	10·0
Total, less cases in which Short Diphtheria bacilli only are found	2	...	...	...	1	...	2	...	0·0	260	24	8·5	411	39	9·4
Various forms of Diphtheria bacilli + Streptococci	...	...	2	1	1	...	3	1	33·3	218	26	11·1	406	53	13·05
Cases in which Short Diphtheria bacilli only are found	...	...	1	1	...	...	1	1	100·0	51	4	7·8	100	13	13·0
Total, less cases in which Short Diphtheria bacilli only are found	...	...	1	...	1	...	2	...	0·0	202	24	11·8	306	42	13·7
Various forms of Diphtheria bacilli + Staphylococci	4	...	...	...	...	...	4	...	0·0	196	22	11·2	371	60	16·08
Cases in which Short Diphtheria bacilli only are found	...	...	...	...	...	...	...	...	0·0	28	3	10·7	62	9	14·4
Total, less cases in which Short Diphtheria bacilli only are found	4	...	...	...	...	...	4	...	0·0	168	19	11·3	306	51	16·6
Various forms of Diphtheria bacilli + Streptococci and Staphylococci	1	...	2	...	...	...	3	...	0·0	258	26	10·0	403	71	14·8
Cases in which Short Diphtheria bacilli only are found	...	...	...	...	...	...	...	...	0·0	48	2	4·1	123	10	8·1
Total, less cases in which Short Diphtheria bacilli only are found	1	...	2	...	...	...	3	...	0·0	200	25	12·5	373	61	16·3

staphylococci, the growth was looked upon as being a "pure" culture of the diphtheria bacillus, whilst in a similar fashion a large number of streptococci, accompanied by only a few staphylococci, along with diphtheria bacilli of any form whatever, would be classified as a mixture of diphtheria bacilli and streptococci. The same remarks hold good as regards the classification of the various forms of diphtheria bacilli.

It is quite possible, of course, that in a few cases streptococci may, owing to the irregularity of their growth and to the somewhat later period at which they make their appearance in considerable numbers, have been included under the staphylococcus group, but the general statement still remains that the mixed staphylococcal infections appear to play a more important part in determining a severe and fatal form of the disease than is generally recognised.

It would appear, moreover, that in all cases mixed infections give rise to graver lesions and more fatal results than do simple infections, even with the more virulent forms of diphtheria bacilli.

How far this greater gravity may be due to the preparation of the mucous membrane of the throat by the action upon it of the various cocci and their poisons; how far to a cumulative action of the coccal and diphthereal poisons; or, again, how far the secondary invasion of the cocci, giving rise to septicæmic and pyæmic conditions, may increase the death-rate, can scarcely be determined from the data now before us. Such questions can only be settled by careful clinical observation. We have, however, in the above facts, evidence that not only has the examination of the throat by bacteriological methods great diagnostic value, but that it has a prognostic importance which should certainly not be ignored. Action of pyococci.

For purposes of comparison a brief analysis of the cases of diphtheria complicated with scarlet fever may not be out of place at this point. It must be remembered, of course, that a certain number of these cases, as will be found on reference to the second part of this report, were admitted with symptoms of both scarlet fever and diphtheria, but, on the other hand, that a certain proportion of the cases were attacked (sometimes in hospital, as they were recovering from scarlet fever) with diphtheria there is ample evidence. Diphtheria complicated with scarlet fever.

In former years—*i.e.*, before the introduction of the treatment by antitoxin, the mortality amongst such cases was very high indeed, and it might be expected that diphtheria cases with scarlet fever complications would be accompanied by a very high death-rate, especially as only those are now included in which diphtheria bacilli were demonstrated as being present in the throat. We find, however, on referring to Table VII., that of 1,745 such cases examined, only 229 died—a mortality of 13·1 per cent., as compared with 61·9 per cent.* in the years 1890 to 1894 in the diphtheria cases with scarlet fever complications in the pre-antitoxin period.

It will be noted also that, as a rule, the streptococci are more numerous in these scarlatinal cases than in the ordinary diphtheria cases, and that there is not such a marked difference between the death-rates of the cases in which there are streptococcal and staphylococcal complications.

At the same time it should be observed that the mortality amongst the cases in which the short bacillus alone, or in conjunction with streptococci and staphylococci, is present, is practically the same as in the non-scarlatinal cases; the figures, however, speak for themselves. Mixed infections in scarlet fever.

Turning now to the mixed infections (Table VIII.), we find that here again the staphylococcal complication accounts for the largest percentage mortality—16·08. Then comes the mortality—14·3—arising from the mixed infection of both forms of cocci with the diphtheria bacillus. The streptococcal complication accounts for a death-rate of 13·05, whilst we have the highest rate of recovery in those cases in which diphtheria bacilli only are found, here the death-rate being only 9·5 per cent. These figures, like those of Table VI., show how far the bacteriological examination can be utilised for prognostic as well as for diagnostic purposes.

From consideration of Table XXXVa. (Appendix) it is evident that a considerable proportion of the cases that were sent in certified as suffering from scarlet fever and diphtheria were certainly suffering from diphtheria. Mixed Scarlatina and Diphtheria cases.

In 1895 a number of these cases were treated with antitoxin, and it will be seen at once that so far as these cases are concerned the stronger antitoxin appears to have exerted an effect in lowering the percentage mortality, although at the North-Western Hospital, on a small number of cases, there was a considerable rise. The total records collected from the various hospitals show a marked diminution amongst those cases in which more antitoxin was given—in the one case (where weaker serum was used) the mortality being 29·5 per cent. in 61 cases; in the other (stronger serum), 18·1 per cent. on 110 cases. In 1896, when only the more potent serum was used, the percentage mortality on this class of case was 22·2 on 260 cases, ranging between 16·6 on a small number of cases at the South-Western Hospital to 33·3 per cent. on a rather larger number of cases at the North-Western Hospital; but where larger numbers are concerned the Fountain Hospital, with 18·6 on 86, gives the best results, whereas the highest percentage is at the North-Eastern—only 29·5 on 47 cases.

In Table XXXVIa. are given the number of cases that were suffering from scarlet fever, but in which diphtheria bacilli were found in the throat, and in which antitoxin was injected. Here the numbers are very small; but it must be noted that amongst those injected with the weaker serum there were four, all of which recovered, whilst of those injected with the stronger serum (13 in number) one died. Mixed cases treated with Antitoxin.

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* See Report of the Medical Superintendents upon the use of Antitoxic Serum in the treatment of Diphtheria in the Hospitals of the Metropolitan Asylums Board during the year 1895, p. 33 (London, 1896).

In 1896, on a larger number of cases (70, all injected with the laboratory serum), the percentage mortality was 24·2 per cent.

The figures recorded for 1895 are, of course, not sufficiently large to be relied upon as average numbers.

Of similar cases certified as scarlet fever and diphtheria, in which, however, no diphtheria bacilli were found, and in which antitoxic serum was given, the numbers for 1895 were again very small. Six were treated with serum from other sources, six with laboratory serum; in each set there was one death, giving a mortality of 16·6 per cent. In 1896 these cases were more numerous —20 (see Table XXXVA.)—and the mortality was 25 per cent.

In 1895 a certain proportion of cases were sent in certified as suffering from scarlet fever, and although no diphtheria bacilli were found, antitoxic serum was injected (Table XXXVIA.). Here again the mortality amongst those injected with serum from other sources was comparatively low—25 per cent. on 28 cases—whilst the laboratory serum was used on 9 cases, 5 of which died, giving a percentage mortality of 55·5 per cent.

In 1896 the death-rate amongst this class of cases was still considerably higher than the average amongst ordinary diphtheria cases, being 27·3 on 95 cases.

Mild cases of mixed infection.

In Table XXXVIIA. are collected a series of comparatively mild cases that had been sent in certified as suffering from scarlet fever and diphtheria, in which diphtheria bacilli were found, but which were not looked upon as being sufficiently grave to necessitate the injection of antitoxic serum, or which were already in such a hopeless condition that it was thought that no treatment would be of any avail.

It will be noted that amongst these cases the percentage mortality was very low indeed, except in one hospital—the total percentage mortality being 16·1 per cent. In 1896 the figures are very extraordinary. At one hospital (the Eastern) the percentage mortality is only 2·7, and in two others it is under 9 per cent.; whilst at two other hospitals it is over 40 per cent.; the mortality for the whole being a shade higher—16·6 per cent. In similar cases sent in as suffering from scarlet fever only, in which diphtheria bacilli were found but no antitoxin was given, the death-rate was 13·3 per cent. Here again the figures of the various hospitals vary enormously, though this seems to be due to the fact that in three of them at least only very small numbers of this type of case came under treatment. In 1896 the death-rate amongst this class of case was only 6·8 per cent., and in no hospital was it higher than 12 per cent.

Of the cases sent in as suffering from scarlet fever and diphtheria in which no diphtheria bacilli could be found, and in which no antitoxic serum was given, the mortality on a small number of cases is high, being 36·3 on 11 cases. In 1896 the mortality is the same; but the number of cases is still small—22.

Of the 1,011 scarlet fever cases in which no diphtheria bacilli could be found, and in which no antitoxic serum was given, the percentage mortality in 1895 was 11·4 on 438 cases, and in 1896 9·4 on 573 cases. These figures are of comparatively little interest, and have little bearing on the gist of this Antitoxin Report; they may, therefore, be allowed to speak for themselves.

Certified Cases of Diphtheria in which no Diphtheria Bacilli could be Found.

Before dealing with special features of some of the diphtheria cases it may be well to give the statistics of those cases which were sent into hospital certified as cases of diphtheria, in which, however, no diphtheria bacilli could be found.

In Table IX. are given first the results for 1895, from which it will be seen that in this year 1,471 such cases were examined, and that 1,944 examinations were made. In 1,096 cases the first examination was deemed to be sufficient, except in a small proportion of those cases which died immediately after admission, where, of course, it was impossible to make a second examination, although, had it been possible to make such further examination, diphtheria bacilli might possibly have been found. In 300 cases a second examination was made, and in 57 a third. In the last column of the table is given the percentage proportion of cases in which no diphtheria bacilli were found to the whole of the cases that came to the laboratory for examination. In 1896 no bacilli were found in 1,764 of the cases certified as diphtheria and sent into hospital, or supposed to have contracted diphtheria after coming into the hospital. 2,401 examinations were made of specimens taken from these cases. Here again a considerable number of the cases—409—were examined on two occasions, and a smaller number—76—on three, and 22 on four occasions. As in 1895 the percentage of cases in which no bacilli were found to the whole of the cases examined was much greater at the North-Eastern (Scarlet Fever) Hospital than at any of the others. The totals for the two years are also given, and the same general features which characterise the two previous sets of figures are brought into greater relief from the fact that here we are dealing with larger numbers, and, therefore, with more stable and reliable averages.

It will be seen that in 26·5 per cent. of the whole cases examined during the two years 1895 and 1896 we failed to detect any diphtheria bacilli, so that, allowing for a small percentage of errors of observation, over 20 per cent., or about 3,000 of the cases certified as suffering from diphtheria and admitted into the various hospitals, offered no bacteriological evidence of diphtherial infection.

Diphtheria cases in which no bacilli were found.

In Table X. the numbers of these cases that came in as diphtheria, but in which no diphtheria bacilli were found, are given. Here a rather more detailed list of the organisms found is necessarily set forth, as in a few of the cases (a comparatively small proportion, however)

TABLE IX.—Showing cases in which no Diphtheria bacilli were found in certified cases of Diphtheria, sometimes after repeated examinations.

The total cases examined, and the number and percentage of examinations made in each case are also given.

Hospital.	Cases examined on							Total examinations.	Total cases examined.	Percentage of whole of cases examined.
	1	2	3	4	5	6	7 occasions.			
1895.										
Fountain	139	63	31	7	2	1	...	402	243	26·1
Western	209	23	3	2	...	...	...	272	237	28·2
Eastern...	224	90	8	...	...	...	...	428	322	31·2
South-Eastern	179	37	3	1	...	...	...	266	220	29 9
South-Western	89	25	1	...	...	...	...	142	115	20·5
North-Western	108	49	11	4	1	...	...	260	173	21·7
North-Eastern	91	8	...	...	...	...	...	107	99	63·05
Northern	57	5	...	...	...	...	...	67	62	24·5
Total	1,096	300	57	14	3	1	...	1,944	1,471	27·7
1896.										
Fountain	214	102	27	12	1	...	1	559	357	27·4
Western	223	53	9	2	...	...	...	364	287	24·5
Eastern...	229	76	16	3	...	..	...	441	324	30·8
South-Eastern	217	54	3	...	...	...	...	334	274	28·1
South-Western	103	26	5	...	...	...	...	170	134	21·7
North-Western	111	64	8	2	...	...	...	271	185	20·1
North-Eastern	57	3	1	...	...	...	...	66	61	56·4
Brook	31	16	5	2	...	...	...	86	54	19·4
Northern	59	7	1	1	...	...	...	80	68	21·3
Gore Farm	11	8	1	...	...	...	...	30	20	19·8
Total	1.255	409	76	22	1	...	1	2,401	1,764	25·8
Total cases for 1895 and 1896.										
Fountain	353	165	58	19	3	1	1	961	600	26·8
Western	432	76	12	4	...	...	...	636	524	26·08
Eastern...	453	166	24	3	...	...	...	869	646	31·07
South-Eastern	396	91	6	1	...	...	...	600	494	28·9
South-Western	192	51	6	...	...	...	...	312	249	21·2
North-Western	219	113	19	6	1	...	...	531	358	20·9
North-Eastern	148	11	1	..	...	...	...	173	160	60·3
Brook	31	16	5	2	...	...	...	86	54	19·4
Northern	116	12	1	1	...	..	...	147	130	22·7
Gore Farm	11	8	1	...	...	...	...	30	20	19·8
Total	2,351	709	133	36	4	1	1	4,345	3,235	26·5

organisms other than streptococci and staphylococci were found in the throats of the patients examined. Taking first those cases in which streptococci only were found, it will be observed that for the two years 1895–1896 the death-rate was exceedingly low—only 5·1 per cent. When we come to the cases in which staphylococci were found, a considerable rise in the percentage will be noticed: there are 43 deaths out of 327 cases, giving a percentage mortality of 13·1. In the majority of cases, however, we have to deal with mixtures, in fairly even proportions, of the streptococci and staphylococci; here the percentage is 10·6 on 985 cases. Amongst the cases in which other organisms are found the death-rate is exceedingly low, with the exception of one series of cases only. Yeasts, round Torula, thin threads, and commas account for only one death out of 60 cases; but in a series recorded as containing "thin rods" only, there was a death-rate of 21·7 per cent.—a rate as high as, or higher than, that amongst cases in which the ordinary diphtheria bacilli were found. There were only 23 such cases, and of these 5 died. In the light thrown on these cases by this mortality, it would appear that these thin rods may be really slightly aberrant forms of the diphtheria bacillus, in which case this group should be transferred to the "positive" tables. As, however, these organisms were not considered to be diphtheria bacilli at the time that the examinations were made, it has been considered better to allow them to remain in the tables to which they were originally assigned. It must be noted, too, in connection with the cases recorded in this table, that a certain proportion of them at some time or other probably had diphtheria bacilli in the throat, but that, owing to imperfect swabbing out of the throat, or incomplete examination of the cultures, the diphtheria bacilli were missed. Indeed, as the majority of these cases were examined on a single occasion only, we must, arguing from the cases recorded in the tables in which diphtheria bacilli were found on a second examination, assume that a certain small proportion of these "negative" cases would have been converted into "positive" cases—*i.e.*, diphtheria bacilli would have been found—and the percentage mortality would, in all probability, have been still further lowered—lowered, however,

TABLE X.—Showing the organisms found in the throats of certified cases of Diphtheria in which no Diphtheria bacilli were found. The Total Cases and Percentage Mortalities are given for the separate years 1895 and 1896, and for the two years together.

1895.

	Fountain. Cases.	Fountain. Deaths.	Western. Cases.	Western. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	South-Western. Cases.	South-Western. Deaths.	North-Western. Cases.	North-Western. Deaths.	North-Eastern. Cases.	North-Eastern. Deaths.	Northern. Cases.	Northern. Deaths.	Total. Cases.	Total. Deaths.	Mortality, Per cent.
Streptococci	44	2	71	2	62	5	41	1	27	2	40	6	6	1	25	...	316	19	6·01
Staphylococci	34	4	23	1	41	4	28	4	12	4	20	3	...	..	7	..	165	20	12·1
Streptococci and Staphylococci	87	4	81	7	93	14	55	2	56	4	89	23	...	..	14	...	475	54	11·3
No growth on nutrient medium...	2	..	3	...	1	...	1	...	2	..	1	...	...	...	...	...	10	0	0·0
Yeast	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	..	0	0	0·0
Round Torula	...	...	1	...	2	...	1	..	1	...	2	...	...	...	...	..	7	0	0·0
Spindles	...	...	1	...	...	...	...	...	...	..	...	..	...	...	...	...	1	0	0·0
Thin Threads	...	...	1	...	..	...	..	..	...	..	..	...	1	...	...	...	2	0	0·0
Thin Rods	...	..	1	...	...	..	1	...	1	...	3	1	...	..	...	...	6	1	16·6
Commas	...	...	1	..	...	..	...	..	...	...	...	..	...	.	...	...	1	0	0·0
Total	167	10	183	10	199	23	127	7	99	10	155	33	7	1	46	..	983	94	9·5

1896.

	Fountain. Cases.	Fountain. Deaths.	Western. Cases.	Western. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	South-Western. Cases.	South-Western. Deaths.	North-Western. Cases.	North-Western. Deaths.	North-Eastern. Cases.	North-Eastern. Deaths.	Brook. Cases.	Brook. Deaths.	Northern. Cases.	Northern. Deaths.	Gore Farm. Cases.	Gore Farm. Deaths.	Total. Cases.	Total. Deaths.	Mortality, Per cent.	Total. Cases.	Total. Deaths.	Mortality per cent.
Streptococci	41	3	40	...	54	1	43	4	23	...	40	2	1	...	5	..	2	...	...	...	249	10	4·01	565	29	5·1
Staphylococci	32	6	33	4	22	1	30	6	19	2	20	3	...	...	6	1	...	...	...	...	162	23	14·1	327	43	13·1
Streptococci and Staphylococci	94	7	100	9	72	5	73	7	57	2	93	21	...	...	18	..	3	...	...	...	510	51	10·0	985	105	10·6
No growth on nutrient medium	1	..	6	...	...	...	2	...	..	...	1	1	...	..	...	...	...		...	...	10	1	10·0	20	1	5·0
Yeast	...		...	..	...	..	2	...	...	...	...	...	...	...	...	..	..	...	...	...	2	...	0·0	2	...	0·0
Round Torula	1	...	6	...	8	...	7	...	1	...	2	...	...	...	1	..	..	...	...	...	26	...	0·0	33	...	0·0
Spindles	...	..	...	..	...	..	...	...	...	...	...	...	...	.	...	...	...		...	..	...	...	0·0	1	...	0·0
Thin Threads	...	...	1	1	...	...	...	..	...	..	...	...	...	...	...	...	..	...	...	..	1	1	100·0	3	1	33·3
Thin Rods	...	...	...	...	2	1	3	1	2	1	9	1	...	...	1	..	...	...	...	..	17	4	23·5	23	5	21·7
Commas	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	0·0	1	..	0·0
Total	169	16	186	14	158	8	160	18	102	5	165	28	1	..	31	1	5	..	...	...	977	90	9·2	1,960	184	9·3

TABLE XI.—Cases suffering from Scarlet Fever in which no Diphtheria bacilli, but the following organisms, were found. The Total Cases and Percentage Mortalities are given for the separate years 1895 and 1896, and for the two years together.

1895.

	Fountain. Cases.	Fountain. Deaths.	Western. Cases.	Western. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	South-Western. Cases.	South-Western. Deaths.	North-Western. Cases.	North-Western. Deaths.	North-Eastern. Cases.	North-Eastern. Deaths.	Northern. Cases.	Northern. Deaths.	Total. Cases.	Total. Deaths.	Mortality, Per cent.
Streptococci	26	2	16	4	33	2	29	6	4	1	4	...	54	1	4	...	170	16	9·4
Staphylococci	11	2	7	...	26	3	13	2	1	...	8	2	16	4	3	...	85	13	15·2
Streptococci and Staphylococci	38	7	30	5	62	13	45	6	11	2	5	1	17	2	9	..	217	36	16·5
No growth on nutrient medium...	1	...	1	..	2	...	...	...	..		1	1	1	...	...	...	6	1	16·6
Doubtful growth ...	...	...	...	...	...	...	...	..	...	..	...		...	.	...	...	0	0	0·0
Round Torula	...	...	..	..	...	..	4	..	...	..	...	..	...	...	...	...	4	0	0.0
Thin Rods	...	..	...	.	...	..	2	...	...	...	..	...	2	1	...	...	4	1	25.0
Thick Rods	...	...	...	...	...	...	...	...	...	...	..	...	1	..	..	...	1	0	0.0
Thin Threads	...	...	...	...	...	...	...	..	...	...	...	...	1	...	...	...	1	0	0·0
Total	76	11	54	9	123	18	93	14	16	3	18	4	92	8	16	..	488	67	13·7

1896.

	Fountain. Cases.	Fountain. Deaths.	Western. Cases.	Western. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	South-Western. Cases.	South-Western. Deaths.	North-Western. Cases.	North-Western. Deaths.	North-Eastern. Cases.	North-Eastern. Deaths.	Brook. Cases.	Brook. Deaths.	Northern. Cases.	Northern. Deaths.	Gore Farm. Cases.	Gore Farm. Deaths.	Total. Cases.	Total. Deaths.	Mortality, Per cent.	Total. Cases.	Total. Deaths.	Mortality per cent.
Streptococci	45	3	22	7	35	5	28	1	10	1	1	...	20	..	7	...	24	...	2	...	194	17	8·7	364	33	9·06
Staphylococci	23	3	14	2	24	6	22	7	2	1	3	...	4	2	1	1	12	...	7	...	112	22	19·6	197	35	17·7
Streptococci and Staphylococci	111	15	60	7	99	15	61	8	18	2	14	3	28	2	12	3	21	1	5	...	429	56	13·05	646	92	14·2
No growth on nutrient medium	2	...	1	...	2	...	2	...	...	...	1	...	5	...	...	...	1	...	5	...	19	...	0·0	25	1	4·0
Doubtful growth	4	1	1	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	..	5	1	20·0	5	1	20·0
Round Torula	3	...	3	...	3	...	1	...	1	...	1	...	2	...	2	..	3	...	...	..	19	...	0·0	23	...	0·0
Thin Rods	...	...	...	...	3	1	...	..	1	..	...	...	1	...	...	...	2	...	1	...	8	1	12·5	12	2	16·6
Thick Rods	...	...	...	...	...	..	...	...	...	...	...	...	...	...	1	...	..	...	..		1	...	0·0	2	...	0·0
Thin Threads	...	...	...	...	..	...	...		...	..	...	...	...	...	...	...		...	...	...	...	...	0·0	1	..	0·0
Total	188	22	101	16	166	27	114	16	32	4	20	3	60	4	23	4	63	1	20	...	787	97	12·3	1,275	164	12·8

at the expense of the mortality of the "positive" group. The average 9·3 is, of course, low as compared with the percentage mortality amongst the cases in which diphtheria bacilli were found, but this percentage is made up of a series of cases in which the death-rate varies enormously in different hospitals. For instance, at the Fountain Hospital, taking the two years together, it will be noted that there were 336 cases, with 26 deaths, giving a percentage mortality of 7·73. Cases in which no diphtheria bacilli were found.

At the Western Hospital the figures are 348 cases, with 23 deaths, giving a percentage mortality of 6·61.

At the Eastern Hospital. 344 cases, 30 deaths, giving a percentage mortality of 8·72.

The South-Eastern Hospital, 270 cases, with 24 deaths—a percentage mortality of 8·8.

The South-Western Hospital, 194 cases, 14 deaths, or a percentage mortality of 7·21.

The North-Western Hospital, 302 cases, 58 deaths, giving a percentage mortality of 19·2.

The Brook Hospital had only 1 death in 29 cases—a percentage mortality of 3·4.

At the North-Eastern Hospital there were 7 cases and 1 death—a percentage mortality of 14·2.

Whilst at the Northern Hospital there occurred 41 cases *without a single death.*

These figures leave out of account any cases in which either streptococci or staphylococci were *not* found.

Bacteriological Examination of Cases of Scarlatina.

Coming now to the scarlatina cases, from which swabs were sent up for examination, it will be observed that here the death-rate is comparatively high. In Table XI. the highest percentage mortality—17·7 per cent.—was amongst those cases in which the staphylococcus only was demonstrated. Here, as in previous tables, the presence of a few streptococci would not be taken into account. Where there is a mixture of the streptococci and staphylococci the mortality is 14·2 per cent., whilst in those cases in which streptococci only are present it reaches only 9·06 per cent.

Again, there is a small number of cases—68—in which other organisms only were found. We have also a group corresponding to that above-mentioned, *i.e.*, those cases in which thin rods were found, which shows a comparatively high mortality—16·6 per cent. (2 deaths out of 12)—and it is quite possible that these thin rods here also must be looked upon as forms of diphtheria bacilli, and the same remarks that apply to Table X. may be applied in this instance.

A most important feature in these scarlet fever cases with diphtheritic and non-diphtheritic complications is brought out by a comparison of Tables VII. and XI. Taking the whole of the period 1895–6, and including 15 cases examined in 1894, the mortality in throat cases with scarlet fever complications is practically the same, whether the throat mischief can, by bacteriological examination, be proved to be diphtheritic or whether it is merely a micro-coccal infection of the form usually known as "anginal."

Amongst the diphtheritic cases, 1,745 in number, there were 229 deaths—a percentage mortality of 13·1—whilst of the non-diphtheritic cases, 1,275 in number, 164 died, or 12·8 per cent. It will thus be seen that there is a difference in the mortality of only 0·3 per cent. in favour of the non-diphtheritic (bacteriologically considered) cases. It would appear from these figures, as will further be pointed out when we come to treat of the use of antitoxin in these cases, that this substance when given in full doses practically eliminates the diphtherial factor in throat cases—the diphtheria bacillus and its poisons being so far neutralised that they can exert no cumulative effect in increasing to any marked degree the severity of either the local throat mischief or the constitutional changes and symptoms that accompany these local lesions. This appears to be very strong evidence in favour of the exhibition of antitoxin in those mixed infections resulting in scarlet fever and diphtheria combined. One of the devitalising factors is got rid of, and the tissues have less to do in the other. At all events, the cumulative action is got rid of. Antitoxin in these cases.

Bacteriological Examination of Cases of Hæmorrhagic Diphtheria.

Before dismissing the question of the organisms found associated with cases of diphtheria, it may be well to describe, briefly, the organisms that were found in the throats of patients suffering from hæmorrhagic diphtheria, the most fatal form of diphtheria that is known. On reference to Table XII., it will be seen that in the throats of almost all of these cases the long and irregular forms of diphtheria bacilli were demonstrated. It will also be seen that the staphylococcal complication was present in a large proportion of the cases, either alone or in combination with the streptococcus. In a much smaller number of cases was there a streptococcal complication only. In 1895 there were 74 of these hæmorrhagic cases recorded, of which 61 were treated with antitoxin and 13 without. Of the antitoxin-treated cases 2 recovered, whilst of the non-injected cases every one died.

The same general features are to be observed in the hæmorrhagic cases of 1896. It should also be noted that here, as in 1895, the short and irregular diphtheria bacilli by themselves account for one or two cases only. In this year there were 107 cases of hæmorrhagic diphtheria in which diphtheria bacilli were found; 95 were injected with antitoxin, and a single case recovered, whilst of 12 uninjected cases all died. It is evident from these figures that the constitutional and organic changes are so rapidly produced, apparently by an excessive and rapid production and action of the diphtheria toxin, that profound damage is done before it is possible to introduce the antitoxin—damage to which the patient rapidly succumbs. In addition to these cases in

Table XII.—Showing the Number of cases of Hæmorrhagic Diphtheria injected with Antitoxic Serum in which the various forms of Diphtheria bacilli, either alone or in combination with Streptococci or Staphylococci, or both, occurred in patients admitted to the various Hospitals during the years 1895 and 1896, with the Percentage Mortality for these single periods and for the whole period.

1895.

	Fountain. Cases.	Fountain. Deaths.	Western. Cases.	Western. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	South-Western. Cases.	South-Western. Deaths.	North-Western. Cases.	North-Western. Deaths.	Total. Cases.	Total. Deaths.	Mortality per cent.
Long Diphtheria bacilli (alone) ...	2	2	...	...	...	...	3	2	...	...	...	...	5	4	80·0
Do. + Streptococci	...	...	...	...	1	1	1	1	...	...	1	1	3	3	100·0
Do. + Staphylococci	2	2	...	...	1	1	5	5	1	1	...	...	9	9	100·0
Do. + Streptococci and Staphylococci	...	...	...	...	2	2	3	3	...	...	...	...	5	5	100·0
Short Diphtheria bacilli (alone) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci	...	...	...	...	...	...	1	1	...	...	...	...	1	1	100·0
Do. + Staphylococci	...	...	...	...	...	...	1	1	...	...	...	...	1	1	100·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Irregular Diphtheria bacilli (alone) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Long, Short, and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	1	1	...	...	...	...	1	1	100·0
Do. + Streptococci	...	...	...	...	...	...	1	1	...	...	...	...	1	1	100·0
Do. + Staphylococci	...	...	1	1	...	...	...	...	...	...	...	...	1	1	100·0
Do. + Streptococci and Staphylococci	2	2	...	...	...	...	...	...	...	...	...	...	2	2	100·0
Long and Short Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	1	1	...	...	1	1	100·0
Do. + Streptococci	...	...	2	2	...	...	3	3	...	...	...	...	5	5	100·0
Do. + Staphylococci	5	5	...	...	2	2	1	1	2	2	...	...	10	10	100·0
Do. + Streptococci and Staphylococci	...	...	3	3	1	1	3	3	...	...	...	...	7	7	100·0
Long and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	1	1	...	...	1	1	2	2	100·0
Do. + Streptococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Do. + Staphylococci	...	...	3	3	...	...	2	1	...	...	...	...	5	4	80·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Short and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	1	1	...	...	...	...	1	1	100·0
Do. + Streptococci	...	...	...	...	...	...	1	1	...	...	...	...	1	1	100·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
	11	11	9	9	7	7	28	26	4	4	2	2	61	59	96·72

1896.

	Fountain. Cases.	Fountain. Deaths.	Western. Cases.	Western. Deaths.	Eastern. Cases.	Eastern. Deaths.	South-Eastern. Cases.	South-Eastern. Deaths.	South-Western. Cases.	South-Western. Deaths.	North-Western. Cases.	North-Western. Deaths.	Brook. Cases.	Brook. Deaths.	Total. Cases.	Total. Deaths.	Mortality per cent.	Total. Cases.	Total. Deaths.	Mortality per cent.
Long Diphtheria bacilli (alone) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	5	4	80·0
Do. + Streptococci	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	100·0	4	4	100·0
Do. + Staphylococci	2	2	1	1	...	...	1	1	...	...	...	...	...	...	4	4	100·0	13	13	100·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	5	5	100·0
Short Diphtheria bacilli (alone) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	1	1	100·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	1	1	100·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Irregular Diphtheria bacilli (alone) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Long, Short, and Irregular Diphtheria bacilli (alone)	8	7	3	3	3	3	8	8	3	3	2	2	1	1	28	27	96·43	29	28	96·55
Do. + Streptococci	2	2	3	3	2	2	4	4	2	2	...	...	...	...	13	13	100·0	14	14	100·0
Do. + Staphylococci	5	5	4	4	2	2	3	3	2	2	4	4	...	...	20	20	100·0	21	21	100·0
Do. + Streptococci and Staphylococci	2	2	...	...	...	...	1	1	...	...	...	...	...	...	3	3	100·0	5	5	100·0
Long and Short Diphtheria bacilli (alone)	1	1	2	2	3	3	...	...	1	1	...	...	...	...	7	7	100·0	8	8	100·0
Do. + Streptococci	1	1	1	1	1	1	1	1	...	...	...	...	...	...	4	4	100·0	9	9	100·0
Do. + Staphylococci	1	1	2	2	...	...	...	...	...	...	...	...	...	...	3	3	100·0	13	13	100·0
Do. + Streptococci and Staphylococci	3	3	3	3	2	2	1	1	...	...	...	...	...	...	9	9	100·0	16	16	100·0
Long and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	2	2	100·0
Do. + Streptococci	...	...	...	...	...	...	...	...	1	1	...	...	...	...	1	1	100·0	1	1	100·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	5	4	80·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	100·0	1	1	100·0
Short and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	1	1	100·0
Do. + Streptococci	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	100·0	2	2	100·0
Do. + Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
	26	25	20	20	13	13	19	19	9	9	7	7	1	1	95	94	98·94	156	153	98·07

which diphtheria bacilli could be demonstrated, there were 7 cases of hæmorrhagic diphtheria in 1895 and 6 in 1896 in which no diphtheria bacilli could be found. In 2 staphylococci only were found; in 4 (1 in 1895), streptococci and staphylococci; and in 1, a round Torula only. Two of these cases—one of them with Torula and the other with a mixture of streptococci and staphylococci—recovered, although they were not treated with antitoxin, and were probably not cases of true hæmorrhagic diphtheria. The other five died. Hæmorrhagic Diphtheria.

Taking the hæmorrhagic cases of diphtheria in which diphtheria bacilli were demonstrated, and which were injected with antitoxin (TABLE XII.), it will be noted that of 156 cases only 3 recovered, and that 2 of these were cases in which there were pure cultures of diphtheria bacilli —*i.e*, there were no complicating organisms of any kind. One of these recoveries—that in the first group, that is, in which long diphtheria bacilli only were present—occurred in 1895; the other in 1896, in the fourth group, where we have long, short, and irregular diphtheria bacilli. In 1895 one case, in which long and irregular bacilli were associated with staphylococci, recovered. These, then, are the only three out of the whole series of cases of hæmorrhagic diphtheria injected with antitoxin which recovered. It is interesting to note that the majority of these hæmorrhagic cases appear to be the result of mixed infections; whilst the short and irregular diphtheria bacilli account for a very small proportion—only 5 out of 156—of them. By far the largest group is that in which long, short, and irregular bacilli alone, or associated with staphylococci or streptococci, occur. The next group in importance is that in which long and short bacilli are associated with a mixture of staphylococci and streptococci, or with staphylococci alone. Then comes the group in which the long bacilli are associated with staphylococci.

The same proportion may be observed in TABLE XIII., in which we have statistics of the same kind of cases, which, however, were not injected with antitoxin. Out of 25 cases 8 must be placed in the fourth group—that is, containing long, short, and irregular diphtheria bacilli alone, or associated with staphylococci and streptococci. The other groups correspond fairly closely with those given in the previous table.

In TABLE XIV. are given the hæmorrhagic cases injected with antitoxin in which diphtheria bacilli alone were found—45, with 43 deaths; those in which bacilli plus streptococci were found—31 in number, which were all fatal; those in which the diphtheria bacillus of various forms was complicated with staphylococci—53 in number, with 52 deaths; and those—27 in number—in which diphtheria bacilli were complicated with both staphylococci and streptococci, all of which died. It will at once be seen that the number of cases in which the short form of the diphtheria bacillus was found was very small—only three out of the whole series.

TABLE XV. gives the hæmorrhagic cases in which diphtheria bacilli were found, but which were not injected with antitoxin. It will be seen from these tables that the numbers were about equally distributed amongst the four groups.

At this point, if the data had been available, it would have been interesting to draw a comparison between the clinical and the bacteriological diagnosis, but in few of the forms returned along with the cultures (so few, indeed, that for statistical purposes they are absolutely valueless) was any diagnosis sent, whilst on referring to the case sheets it is found that in most cases the ultimate clinical diagnosis is almost invariably based on or supplemented from the bacteriological report. I have thus been unable to get out any satisfactory figures for more than a very small percentage of the cases examined, and have therefore considered it inadvisable to give partial statistics which could never be anything but uninforming, and would in all probability be actually misleading.

In TABLE XVI. are given the deaths amongst the "completed" cases—first, amongst those in which diphtheria bacilli were found; and secondly, in those in which no diphtheria bacilli could be demonstrated. It is unnecessary to refer to them in detail in individual years; the figures are given simply in order that the death-rate may be compared with the tables of the whole of the cases treated, issued by the Medical Superintendents of the various hospitals under the Board. It is, however, interesting to take the whole of the deaths for the two years and to compare the separate figures and percentages of deaths in those cases in which diphtheria bacilli were found and those in which no diphtheria bacilli were found. It will be seen that the lowest percentage was at the Gore Farm, where not a single death occurred in 81 cases all of which had diphtheria bacilli present in the throat. At the Northern Hospital there were 442 cases in which diphtheria bacilli were found in the throat, and only 10 succumbed, giving a percentage mortality of 2·2 per cent. Of 130 cases in which no diphtheria bacilli were found only one case died, or 0·76 per cent. Deaths amongst "completed" cases.

In four other hospitals—the Fountain, the South-Eastern, the South-Western, and the Brook—the percentage mortality was under 20 per cent.

In three of them—the Western, the Eastern, and the North-Eastern—it was a fraction above 20 per cent.; and in the North-Western it was over 27 per cent. amongst the cases in which diphtheria bacilli were demonstrated to be present.

Coming now to the cases in which diphtheria bacilli could not be found: In five hospitals the mortality was under 10 per cent.—*i.e.*, the Fountain, the Western, the South-Western, the North-Eastern, and the Brook; in two—the Eastern and the South-Eastern—it was a fraction over 11 per cent.; and in the North-Western 18·9 per cent.

TABLE XIII.—Showing the number of cases of Hæmorrhagic Diphtheria (not injected with Antitoxic Serum) in which the various forms of Diphtheria bacilli, either alone or in combination with Streptococci or Staphylococci, or both, occurred in Patients admitted to the various Hospitals during the years 1895 and 1896, with the Percentage Mortality for these two periods and for the whole period.

	1895.													1896.													Total.		Mortality per cent.
	Fountain.		Western.		Eastern.		South-Eastern.		North-Western.		Total.		Mortality per cent.	Fountain.		Western.		Eastern.		South-Eastern.		North-Western.		Total.		Mortality per cent.			
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		Cases.	Deaths.	
Long Diphtheria bacilli (alone) ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci ...	3	3	...	...	...	...	...	...	1	1	4	4	100·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	4	4	100·0
Do. + Staphylococci ...	...	...	...	...	...	...	1	1	...	...	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	1	1	100·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Short Diphtheria bacilli (alone) ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci ...	1	1	...	...	...	...	...	...	...	...	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	1	1	100·0
Do. + Staphylococci ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	1	1	...	...	...	...	...	...	1	1	100·0	...	...	...	...	...	...	1	1	...	...	1	1	100·0	2	2	100·0
Irregular Diphtheria bacilli (alone) ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	1	1	...	...	1	1	100·0	1	1	100·0
Do. + Streptococci ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Staphylococci ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	1	1	...	...	...	...	...	...	1	1	100·0	1	1	100·0
Long, Short, and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	1	1	1	1	2	2	1	1	5	5	100·0	5	5	100·0
Do. + Streptococci ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Staphylococci ...	...	...	...	...	...	...	...	...	1	1	1	1	100·0	1	1	...	...	...	...	...	...	...	...	1	1	100·0	2	2	100·0
Do. + Streptococci and Staphylococci	...	...	...	...	1	1	...	...	...	...	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	1	1	100·0
Long and Short Diphtheria bacilli (alone) ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Staphylococci ...	1	1	...	...	...	...	1	1	...	...	2	2	100·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	2	2	100·0
Do. + Streptococci and Staphylococci	...	...	...	...	1	1	...	...	...	...	1	1	100·0	...	...	...	...	1	1	1	1	1	1	3	3	100·0	4	4	100·0
Long and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci ...	1	1	...	...	...	...	...	...	...	...	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	1	1	100·0
Do. + Staphylococci ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Short and Irregular Diphtheria bacilli (alone)	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Staphylococci ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Do. + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
	6	6	1	1	2	2	2	2	2	2	13	13	100·0	1	1	2	2	2	2	5	5	2	2	12	12	100·0	25	25	100·0

TABLE XIV.—Cases of Hæmorrhagic Diphtheria injected with Antitoxic Serum.—Cases, Deaths, and Percentage Mortality for the years 1895 and 1896.

	1895. Fountain.		Western.		Eastern.		South-Eastern.		South Western.		North-Western.		Total.		Mortality per cent.	1896. Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		Brook.		Total.		Mortality per cent.	Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		Cases.	Deaths.	
Mixed Diphtheria bacilli (Long, Short, and Irregular)	2	2	...	...	...	...	6	5	1	1	1	1	10	9	90·0	9	8	5	5	6	6	8	8	4	4	2	2	1	1	35	34	97·1	45	43	95·5
Short bacilli only	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Total, less Short bacilli	2	2	...	...	...	...	6	5	1	1	1	1	10	9	90·0	9	8	5	5	6	6	8	8	4	4	2	2	1	1	35	34	97·1	45	43	95·5
Streptococci	...	...	2	2	1	1	7	7	...	...	1	1	11	11	100·0	4	4	5	5	3	3	5	5	3	3	...	...	...	...	20	20	100·0	31	31	100·0
Mixed Diphtheria bacilli + Short bacilli and Streptococci ...	...	...	...	...	...	...	1	1	...	...	...	...	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	1	1	100·0
Total, less Short bacilli and Streptococci	...	...	2	2	1	1	6	6	...	...	1	1	10	10	100·0	4	4	5	5	3	3	5	5	3	3	...		...	...	20	20	100·0	30	30	100·0
Mixed Diphtheria bacilli + Staphylococci	7	7	4	4	3	3	9	8	3	4	...	..	26	25	96·1	8	8	7	7	2	2	4	4	2	2	4	4	...	...	27	27	100·0	53	52	98·1
Short bacilli and Staphylococci	...	...	...		...	...	1	1	...	...	...	...	1	1	100·0		...	...	...	...	...	...	...		...	...		...	...	...	...	0·0	1	1	100·0
Total, less Short bacilli and Staphylococci	7	7	4	4	3	3	8	7	3	3	...	..	25	21	96·0	8	8	7	7	2	2	4	4	2	2	4	4	...	...	27	27	100·0	52	51	98·07
Mixed Diphtheria bacilli + Streptococci and Staphylococci ...	2	2	3	3	3	3	6	6	..	...	...	...	14	14	100·0	5	5	3	3	2	2	2	2	...	...	1	1	...	...	13	13	100·0	27	27	100·0
Short bacilli + Streptococci and Staphylococci	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Total, less Short bacilli + Streptococci and Staphylococci ...	2	2	3	3	3	3	6	6	...	...	...	...	14	14	100·0	5	5	3	3	2	2	2	2	...	..	1	1	...	...	13	13	100·0	27	27	100·0

TABLE XV.—Cases of Hæmorrhagic Diphtheria in which no Antitoxic Serum was injected.—Cases, Deaths, and Percentage Mortality for the years 1895 and 1896.

	1895. Fountain.		Western.		Eastern.		South-Eastern.		North-Western.		Total.		Mortality per cent.	1896. Fountain.		Western.		Eastern.		South-Eastern.		North-Western.		Total.		Mortality per cent.	Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		Cases.	Deaths.	
Mixed Diphtheria bacilli (Long, Short, and Irregular) ...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	1	1	1	1	3	3	1	1	6	6	100·0	6	6	100·0
Short bacilli only	...	...	...		...	...	...	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Total, less Short bacilli	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...		1	1	1	1	3	3	1	1	6	6	100·0	6	6	100·0
Mixed Diphtheria bacilli + Streptococci	5	5	...		...	...	...	...	1	1	6	6	100·0	...	...	...	...	...		...	...	...	...	...	...	0·0	6	6	100·0
Short bacilli + Streptococci	1	1	...	...	...	...	...	...	...	...	1	1	100·0	...	...	...	...		...	...	...	...	...	...	...	0·0	1	1	100·0
Total, less Short bacilli + Streptococci	4	4		...	...	...	...	...	1	1	5	5	100·0		...	...		...	...	...	...	...	...	...	...	0·0	5	5	100·0
Mixed Diphtheria bacilli + Staphylococci	1	1	...	...	...	...	2	2	1	1	4	4	100·0	1	1	...	...	...	...	...	...	...	...	1	1	100·0	5	5	100·0
Short bacilli + Staphylococci	...	...		...	...	...	...	...		...	...	...	0·0	...	...		...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Total, less Short bacilli + Staphylococci	1	1	...	...	...	...	2	2	1	1	4	4	100·0	1	1	...	...	...	...	...	...	...	...	1	1	100·0	5	5	100·0
Mixed Diphtheria bacilli + Streptococci and Staphylococci	...	...	1	1	2	2	...		...	...	3	3	100·0	...	...	1	1	1	1	2	2	1	1	5	5	100·0	8	8	100·0
Short bacilli + Streptococci and Staphylococci	...	...	1	1	...		...	...	...	...	1	1	100·0	...	...		...	...	...	1	1	...	...	1	1	100·0	2	2	100·0
Total, less Short bacilli + Streptococci and Staphylococci	...	...	...	...	2	2	...	...	...	...	2	2	100·0	...	...	1	1	1	1	1	1	1	1	4	4	100·0	6	6	100·0

Table XVI.—Shewing cases of Diphtheria in which Death occurred.

1894.

Hospital.	Diphtheria bacilli found.	Mortality per cent.	No Diphtheria bacilli found.	Mortality per cent.	Total Deaths.
Fountain	1	9·09	...	0·0	1
Eastern	1	20·0	...	0·0	1
South-Eastern	1	3·4	...	0·0	1
Total	3	6·6	...	0·0	3

1895.

Hospital.	Diphtheria bacilli found.	Mortality per cent.	No Diphtheria bacilli found.	Mortality per cent.	Total Deaths.
Fountain	125	18·1	21	8·6	146
Western	130	21·7	19	8·01	149
Eastern	185	26·1	41	12·7	226
South-Eastern	109	21·2	21	9·5	130
South-Western	99	22·2	13	11·3	112
North-Western	157	25·2	37	21·3	194
North-Eastern	13	22·4	9	9·09	22
Northern	6	3·1	...	0·0	6
Total	824	21·5	161	10·9	985

1896.

Hospital.	Diphtheria bacilli found.	Mortality per cent.	No Diphtheria bacilli found.	Mortality per cent.	Total Deaths.
Fountain	171	18·1	38	10·6	209
Western	171	19·3	30	10·4	201
Eastern	109	15·03	35	10·8	144
South-Eastern	135	19·2	34	12·4	169
South-Western	79	16·4	9	6·7	88
North-Western	209	28·5	31	16·7	240
North-Eastern	9	19·1	4	6·5	13
Brook	41	18·3	5	9·2	46
Northern	4	1·5	1	1·4	5
Gore Farm	...	0·0	...	0·0	...
Total	928	18·3	187	10·6	1,115

Total Deaths for 1894, 1895, and 1896.

Hospital.	Diphtheria bacilli found.	Mortality per cent.	No Diphtheria bacilli found.	Mortality per cent.	Total Deaths.
Fountain	297	18·08	59	9·8	356
Western	301	20·2	49	9·3	350
Eastern	295	20·5	76	11·7	371
South-Eastern	245	19·7	55	11·1	300
South-Western	178	19·2	22	8·8	200
North-Western	366	27·07	68	18·9	434
North-Eastern	22	20·9	13	8·1	35
Brook	41	18·3	5	9·2	46
Northern	10	2·2	1	0·7	11
Gore Farm	...	0·0	...	0·0	...
Total	1,755	19·6	348	10·75	2,103

Persistence of Diphtheria Bacilli.*

Persistence of diphtheria bacilli.

From a consideration of Tables XVII. and XVIII. it will be seen that the persistence of the diphtheria bacillus for periods up to eight weeks is of very common occurrence, whether antitoxin be given or not; indeed, the majority of cases appear to retain bacilli in the throat for from 2 to 9 weeks. After the 9th week the number falls off very rapidly, but it will be noticed that in 1895 one case in which antitoxin was used, and one case treated without antitoxin, were found to have the throat infected with the diphtheria bacillus for a longer period than 200 days, and a considerable number—79 of those that received antitoxin, and 24 of those that were not so treated—remained infective for a longer period than 100 days—*i.e.*, they were considered to be infective cases, because diphtheria bacilli could still be demonstrated in the mucous membrane of the throat or fauces at the end of these periods.

In 1896 there were no cases in which diphtheria bacilli were still present after the 189th day amongst the injected cases, and after the 169th day amongst the non-injected cases. 93

* This persistence is reckoned from the date of the first examination to that of the examination at which it was no longer possible to demonstrate the presence of diphtheria bacilli Of course the statistics include only those cases that were returned for re-examination before they were discharged, and in which a negative result was finally obtained—*i.e.*, no diphtheria bacilli could be demonstrated. The date of the initial symptoms of the disease, or even earlier, would probably be a more accurate limit to take for the first appearance of the bacilli; but this could not always be obtained, whilst the examination date could always be accurately determined. At the other limit, on the other hand, there is sometimes, to counteract this, a margin of six or seven days, as cases were seldom examined more than once a week.

Table XVII.—Period in days during which Diphtheria bacilli persisted in cases that were injected with Antitoxic Serum.

1894.

Hospital.	Under 10 days.	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to 109	110 to 119	120 to 129	130 to 139	140 to 149	150 to 159	160 to 169	170 to 179	180 to 189	190 to 199	200 to 209	Total.
Fountain ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Eastern ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.	1
South-Eastern ...	4	1	1	...	2	...	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	11
Total	4	1	3	...	2	...	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	13

1895.

Hospital.	Under 10 days.	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to 109	110 to 119	120 to 129	130 to 139	140 to 149	150 to 159	160 to 169	170 to 179	180 to 189	190 to 199	200 to 209	Total.
Fountain ...	2	1	11	43	33	27	16	6	13	5	1	2	1	1	...	...	...	...	...	...	...	162
Western ...	3	5	14	62	60	33	28	25	16	9	10	4	5	...	2	.	1	...	...	1	1	279
Eastern ...	6	1	8	27	37	22	14	11	4	7	7	1	2	...	...	...	1	...	...	...	...	148
South-Eastern ...	13	17	11	39	49	44	31	20	24	7	11	8	1	1	2	...	1	...	...	...	...	279
South-Western ...	1	...	...	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
North-Western ...	11	12	25	25	17	16	21	15	8	5	6	2	2	1	2	...	...	...	...		...	168
Northern ...	1	17	14	10	6	7	1	1	...	...	1	...	...	...	...	...	...	...	...	1	...	59
Total	37	53	83	207	206	149	111	78	65	33	36	17	11	3	6	...	3	...	...	2	1	1,101

1896.

Hospital.	Under 10 days.	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to 109	110 to 119	120 to 129	130 to 139	140 to 149	150 to 159	160 to 169	170 to 179	180 to 189	190 to 199	200 to 209	Total.
Fountain ...	5	9	26	93	61	34	26	11	4	4	2	2	2	1	...	...		...	...	...	...	280
Western ...	9	17	87	70	63	25	38	15	13	6	14	14	1	4	...	1	...	...	...	...	...	377
Eastern ...	3	5	15	52	63	30	17	15	16	4	4	3	2	2	1	...	...	1		...	..	242
South-Eastern ...	6	3	14	27	51	36	37	32	25	15	...	19	7	2	1	1	2	1	2	...	...	281
South-Western ...	...	...	4	5	13	4	5	1	3	..	...	...	...	...	1	...	...	...	...	.	...	36
North-Western ...	9	33	66	22	19	12	7	8	4	3	1	...	...	...	...	...	...	...	...	...	...	184
Brook ...	1	1	1	11	27	8	7	7	.	4	...	...	...	...	...	...	...	..	...	...	...	67
Northern ...	40	44	24	16	8	6	2	4	1	...	1	...	...	...	...	...	...	...	...	...	...	146
Gore Farm ...	...	1	8	11	3	3	4	...	.		...		1	...	...	...	...	...	...	...	...	31
Total	73	113	245	307	308	167	143	93	66	36	22	38	13	9	3	2	2	2	2	...	...	1,644

TABLE XVIII.—Period in days during which Diphtheria bacilli persisted in cases in which no Antitoxic Serum was injected.

Hospital.	Under 10 days.	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to 109	110 to 119	120 to 129	130 to 139	140 to 149	150 to 159	160 to 169	170 to 179	180 to 189	190 to 199	200 to 209	Total.
1894.																						
Fountain	...	...	1	1	...	1	...	...	...	...	...	...		...	...	...	...	...	...	...	...	3
Eastern	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
South-Eastern	2	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
Total	2	2	1	1	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9
1895.																						
Fountain	10	15	28	54	49	22	24	10	6	4	2	2	1	...	...	...	...	...	...	...	...	227
Western	3	4	16	49	35	20	10	9	4	3	1	1	1	...	...	1	1	...	...	...	...	158
Eastern	4	12	28	48	57	29	20	8	11	3	5	1	...	...	1	...	...	...	...	...	1	228
South-Eastern	7	3	4	6	12	7	4	...	5	1	...	1	...	...	...	...	...	...	...	...	...	50
South-Western	...	...	...	3	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
North-Western	15	39	59	36	31	18	20	13	6	1	3	1	...	...	...	...	...	...	...	...	...	242
North-Eastern	...	4	8	7	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22
Northern	14	17	34	19	10	13	5	4	4	1	1	...	...	...	...	...	...	...	...	...	...	122
Total	53	94	177	222	198	110	84	44	36	13	12	6	2	...	1	1	1	...	...	...	1	1,055
1896.																						
Fountain	8	8	28	62	16	20	4	2	4	1	1	1	...	1	...	...	...	...	...	...	...	156
Western	1	13	68	58	27	19	8	10	11	8	4	2	1	1	1	...	...	...	...	...	...	232
Eastern	2	7	18	27	25	12	6	3	1	3		...	...	1	...	1	1	...	...	...	...	107
South-Eastern	17	6	4	19	22	12	4	4	1	3	2	2	1	...	...	...	...	...	...	...	...	97
South-Western	...	...	4	3	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12
North-Western	14	35	62	25	30	23	8	14	6	6	3	3	1	1	...	1	...	...	...	...	...	232
North-Eastern	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Brook	3	1	1	7	9	3	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	25
Northern	14	18	12	5	2	3	3	1	...	2	...	...	...	...	...	...	...	...	...	...	...	60
Gore Farm	1	2	5	3	3	4	2	...	..	...	...	...	1	...	...	...	...	...	...	...	...	21
Total	60	90	202	210	137	98	35	34	23	24	10	8	4	4	1	2	1	...	...	...	...	943

still contained bacilli on the mucous membranes after the 100th day amongst the injected cases, and 30 amongst those in which antitoxin was not given.

The details of these tables, however, are of considerable interest, and at once give an idea of the very important part that this persistence of the diphtheria bacillus may play in determining the spread of diphtheria through old cases, which are supposed to be no longer infective, but in which the infective element, though unlooked for, is still present.

Patients Discharged from Hospital, before an Examination at which no Diphtheria Bacilli could be Demonstrated, had been made—*i.e.*, Diphtheria Bacilli were Present at the Final Examination.

Patients sent out before the bacilli had disappeared.

One of the main objects to be attained by submitting the throats of patients to bacteriological examination is undoubtedly to determine the period at which convalescent patients have so far returned to their normal condition that diphtheria bacilli are no longer harboured in their throats. It is now a matter of common experience that so long as these bacilli (even the less virulent forms) remain in the crypts of the tonsils, &c., so long is the patient a centre of infection, the diphtheria bacilli present resuming, under favourable conditions, their more virulent form.

In Tables XIX. and XX. are given lists of such cases, from which it will be seen that in 1895, of the injected cases (leaving the South-Western Hospital out of account, as from this hospital a second sample was rarely sent), there were 171 cases, and amongst the uninjected 262 cases, or 433 cases altogether, which at the time of our last examination still gave evidence that they were in a condition in which they *might* still be foci of infection.

In 1896 the figures are not complete, as a large number of the cases towards the end of the year were examined on one occasion only, so that, as in the case of the South-Western patients, it is impossible to include them in a table of this kind. We find, however, that, omitting these two groups, there remain 298 injected cases in which diphtheria bacilli were still present at the last examination before they were discharged; whilst of the uninjected cases there were 261 in which these bacilli still remained, or 559 cases in all. In 1895, then, we have 12·8 per cent. of the cases in which diphtheria bacilli were found at any time still retaining these bacilli in the throat at the last examination, and again leaving out of account those examined on one occasion only, 13·8 per cent. in 1896.

Table XIX.—Showing number of cases (at different ages) in which Diphtheria bacilli were found and Antitoxic Serum was injected, which recovered and were discharged, although the cultures made from their throats at the last examination still gave evidence of the presence of Diphtheria bacilli.

Ages.	Fountain.	Western.	Eastern.	South-Eastern.	* South-Western.	North-Western.	North-Eastern.	Brook.	Northern.	Gore Farm.
1895.										
Under 1	...	...	...	...	7	...	...	...	...	...
1 to 2	1	...	4	4	11	2	...	...	...	...
2 ,, 3	4	1	10	8	16	3	...	...	...	...
3 ,, 4	5	4	6	3	27	5	...	...	...	...
4 ,, 5	8	4	8	10	67	...	...	...	...	...
5 ,, 10	9	14	17	10	59	9	...	...	...	...
10 ,, 15	3	1	6	5	12	2	...	...	...	...
15 ,, 20	...	...	1	1	4	1	...	...	...	...
20 and upwards ..	...	1	...	1	...	...	...	...	...	...
Total	30	25	52	42	203	22	...	...	...	...
Percentage on Total Cases	10·4	6·06	17·2	10·0	66·9	8·0	...	...	...	...
1896.										
Under 1	2	...	2	3	6	1	...	...	...	...
1 to 2	7	4	8	9	7	2	...	4	...	...
2 ,, 3	17	12	18	7	20	4	2	8	..	...
3 ,, 4	16	4	26	17	24	13	1	11	1	3
4 ,, 5	31	14	12	23	20	9	3	10	2	4
5 ,, 10	85	34	69	38	98	17	1	28	17	14
10 ,, 15	21	4	11	3	33	2	1	5	4	1
15 ,, 20 ...	2	1	..	2	2	1	...	...	1	...
20 and upwards ...	8	5	7	...	5	1	1	1	1	...
Total	189	78	153	102	215	50	9	67	26	22
Percentage on Total Cases	29·6	12·7	31·1	20·03	69·1	14·1	50·0	39·1	14·5	38·5
	†72	*†62*	*†60*	*†70*	*†28*	*†34*	...	*†58*	*†20*	*†22*

* In the case of the South-Western Hospital a second specimen was seldom sent for examination in the ordinary routine work.

† A second culture was not sent in these cases, and no final negative result could be obtained, as the arrangement for the examination of specimens did not continue in force after the 31st December, 1896. None of these cases were discharged until 1897.

TABLE XX.—Showing number of cases (at different ages) in which Diphtheria bacilli were found but no Antitoxic Serum was injected, which recovered and were discharged, although the cultures made from their throats at our last examination still showed the presence of Diphtheria bacilli.

1895.

Ages.	Fountain.	Western.	Eastern.	South-Eastern.	* South-Western.	North-Western.	North-Eastern.	Brook.	Northern.	Gore Farm.
Under 1 ...	1	..	...	1	2	...	...	...	...	...
1 to 2	4	1	1	1	1	2	1	..	..	...
2 ,, 3	4	2	6	1	5	3	1		...	...
3 ,, 4	4	2	6	3	8	5	3	...	...	...
4 ,, 5	8	1	9	5	8	1	5	...	...	...
5 ,, 10	32	4	32	10	49	10	7	...	3	...
10 ,, 15	13	3	20	3	27	9	3	...	...	...
15 ,, 20	2	...	4	3	10	2	.	..	...	...
20 and upwards ...	6	1	5	4	16	3	2	...	...	...
Total	74	14	83	31	126	35	22	...	3	..
Percentage on Total Cases	18·5	7·4	20·4	32·9	89·3	10·1	37·9	...	2·4	...

1896.

Ages.	Fountain.	Western.	Eastern.	South-Eastern.	* South-Western.	North-Western.	North-Eastern.	Brook.	Northern.	Gore Farm.
Under 1	...	...	...	2	1	...	...	...	...	...
1 to 2	4	...	2	2	2	...	2	...	...	...
2 ,, 3	2	...	4	5	...	2	3	2	...	...
3 ,, 4	10	1	14	2	7	5	3	5	...	...
4 ,, 5	6	3	13	6	4	13	4	3	3	...
5 ,, 10	41	8	36	17	66	21	8	8	3	1
10 ,, 15	14	1	27	12	34	8	5	4	1	3
15 ,, 20	6	...	2	4	12	...	2	3	...	...
20 and upwards	11	4	13	8	22	3	1	3	...	...
Total	94	17	111	58	148	52	28	28	7	4
Percentage on Total Cases	30·7	6·2	47·4	30·3	87·05	13·7	96·5	52·8	9·7	16·6
	†14	†14	†25	†21	†17	†27	†4	†24	†5	†4

* In the case of the South-Western Hospital a second specimen was seldom sent for examination in the ordinary routine work.

† A second culture was not sent in these cases, and no final negative result could be obtained, as the arrangement for the examination of specimens did not continue in force after the 31st December, 1896. None of these cases were discharged until 1897.

PERCENTAGE MORTALITY AMONGST CASES EXAMINED.

For convenience of classification, the completed cases of diphtheria have been arranged in three groups, each group containing the cases *admitted* during one year; for although the bacteriological examinations were carried out entirely during the years 1895 and 1896, a considerable number of the cases were admitted in 1894, whilst a number were not discharged until some time during the year 1897. In order to include the whole of these cases, I have taken the date of admission as the basis of classification, and have arranged the cases in three sets of tables, each one dealing with the cases that were admitted during a single year.

TABLE XXI.—Percentage Mortality at different ages of all cases that have been bacteriologically examined, and in which Diphtheria bacilli were found. (The day of disease on which treatment was commenced is based on the Ambulance Nurse's Report.)

1894.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No History.		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2 ...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	1	...	...	...	4	...	0·0
2 „ 3 ...	1	1	...	...	2	...	1	...	1	...	...	...	...	...	...	...	...	...	5	1	20·0
3 „ 4 ...	...	...	1	...	2	...	1	...	2	1	1	...	...	...	1	...	...	...	8	1	12·5
4 „ 5 ...	1	...	2	...	...	...	1	...	1	...	1	...	...	...	1	...	...	...	7	...	0·0
5 „ 10 ...	...	...	3	...	7	1	1	...	...	...	...	...	...	...	...	...	...	...	11	1	9·09
10 „ 15 ...	1	...	1	...	1	...	1	...	...	...	...	...	2	...	...	...	...	...	6	...	0·0
15 „ 20 ...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	3	...	0·0
20 & upwards	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
Total ...	3	1	8	...	12	1	8	...	4	1	4	...	2	...	4	...	...	...	45	3	6·6
Mortality per cent.	...	33·3	...	0·0	...	8·3	...	0·0	...	25·0	...	0·0	...	0·0	...	0·0	...	...	...	...	...

1895.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No History.		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1 ...	3	2	17	8	10	4	6	...	2	...	7	4	1	...	8	4	...	...	54	22	40·7
1 to 2 ...	14	6	45	17	39	21	34	25	29	12	20	9	10	3	29	17	4	2	224	112	50·0
2 „ 3 ...	16	4	65	12	56	24	64	27	37	13	26	7	16	7	40	15	3	1	323	110	34·05
3 „ 4 ...	38	6	71	11	88	27	83	32	63	17	49	19	25	8	49	17	4	1	470	138	29·3
4 „ 5 ...	42	3	92	17	85	24	84	27	55	17	42	18	22	6	61	16	2	...	485	128	26·3
5 „ 10 ...	141	6	237	26	286	61	249	49	202	39	128	35	69	17	126	23	8	...	1446	256	17·7
10 „ 15 ...	45	...	82	8	101	5	98	8	48	8	43	7	21	3	43	2	1	...	482	41	8·5
15 „ 20 ...	12	...	20	2	24	1	34	3	16	...	16	2	5	...	14	3	4	...	145	11	7·5
20 & upwards	10	...	35	...	35	1	42	2	30	1	17	...	9	2	17	...	...	...	195	6	3·07
Total ...	321	27	664	101	724	168	694	173	482	107	348	101	178	46	387	97	26	4	3824	824	21·5
Mortality per cent.	...	8·4	...	15·2	...	23·2	...	24·9	...	22·1	...	29·02	...	25·8	...	25·06	...	15·3	...	...	...

1896.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No History.		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1 ...	5	...	14	7	14	7	11	3	11	2	4	1	6	4	9	4	...	...	74	28	37·8
1 to 2 ...	3	2	40	17	65	27	46	22	34	13	20	11	8	5	25	14	...	...	241	111	46·05
2 „ 3 ...	15	5	74	18	78	24	75	27	65	16	47	16	23	8	38	12	...	...	415	126	30·3
3 „ 4 ...	49	3	103	14	119	24	107	33	81	19	78	29	36	7	62	17	...	...	635	146	22·9
4 „ 5 ...	42	1	95	13	122	35	125	28	113	37	62	13	36	11	76	15	...	...	671	153	22·7
5 „ 10 ...	222	8	283	19	359	56	367	64	264	54	181	39	130	34	222	41	...	..	2028	315	15·5
10 „ 15 ...	76	...	73	4	106	3	109	10	87	11	58	4	36	3	57	5	...	...	602	40	6·6
15 „ 20 ...	16	...	16	...	35	...	23	2	29	3	13	...	6	...	9	1	...	...	147	6	4·08
20 & upwards	4	...	29	...	64	..	60	1	25	...	31	1	11	...	31	1	...	...	255	3	1·1
Total ...	432	19	727	92	962	176	923	190	709	155	494	114	292	72	529	110	...	...	5068	928	18·3
Mortality per cent.	...	4·3	...	12·6	...	18·2	...	20·5	...	21·8	...	23·07	...	24·6	...	20·7	...	...	...	...	...

SUMMARY.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No History.		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1 ...	8	2	31	15	24	11	17	3	13	2	11	5	7	4	17	8	0	0	128	50	39·06
1 to 2 ...	17	8	85	34	104	48	81	47	63	25	42	20	18	8	55	31	4	2	469	223	47·5
2 „ 3 ...	32	10	139	30	136	48	140	51	103	29	73	23	39	15	78	27	3	1	743	237	31·8
3 „ 4 ...	87	9	175	25	209	51	191	65	146	37	128	48	61	15	112	34	4	1	1113	285	25·6
4 „ 5 ...	85	4	189	30	207	59	210	55	169	54	105	31	58	17	138	31	2	0	1163	281	24·1
5 „ 10 ...	363	14	523	45	652	118	617	113	466	93	309	74	199	51	348	64	8	0	3485	572	16·4
10 „ 15 ...	122	0	156	12	208	8	208	18	135	19	101	11	59	6	100	7	1	0	1090	81	7·4
15 „ 20 ...	28	0	36	2	59	1	59	5	45	3	29	2	11	0	24	4	4	0	295	17	5·7
20 & upwards	14	0	65	0	99	1	102	3	55	1	48	1	20	2	48	1	0	0	451	9	1·9
Total ...	756	47	1399	193	1698	345	1625	363	1195	263	846	215	472	118	920	207	26	4	8937	1755	19·6
Mortality per cent.	...	6·2	...	13·7	...	20·3	...	22·3	...	22·008	...	25·4	...	25·0	...	22·5	...	15·3	...	...	...

In Table XXI. are given those cases in which diphtheria bacilli were found. In 1894 the numbers are comparatively small, and can be of little use for purposes of comparison. The 1895 table includes 3,824 cases, which may be roughly analysed as follows :—

There were 824 deaths, giving a mortality of 21·5 per cent. The lowest mortality in this group was 8·4 per cent. amongst those cases which were brought under treatment on the first day. Percentage mortality in 1895.

There was a mortality of 15·2 per cent. amongst those treated on the second day. The highest mortality was amongst patients between one and two years, 50 per cent. of these patients dying, and was lowest in patients over 20 years of age, in which the mortality was only 3·07 per cent. It should be observed that amongst cases admitted on the third day the mortality is high—23·2 per cent.—whilst in the cases admitted after the sixth day the mortality ranges from 25·06 to 29·02 per cent. It should be noted, too, that all these are cases in which diphtheria bacilli were found, and concerning which there can, therefore, be no doubt as to the diagnosis, both bacteriological and clinical diagnoses agreeing. And in 1896. Taking the figures for 1896, we find that here we have 5,068 cases, with 928 deaths, giving a percentage mortality of 18·3, or 3·2 per cent. less than in the previous year. Of the patients who came under treatment on the first day the mortality has fallen to nearly one-half—*i.e.*, from 8·4 to 4·3. On the second day the mortality is now only 12·6 per cent., on the third day 18·2, whilst of the cases brought under treatment later than the sixth day the mortality ranges from 20·7 to 24·6—a notable diminution as compared with the cases in the preceding table. Here, again, it will be noticed that the highest mortality—46·05 per cent.—occurs in cases in children between one and two years of age, whilst the lowest—1·1—occurs in patients over 20 years of age. It will be noticed that these figures do not quite coincide with those published in the Report drawn up by the Medical Superintendents of the various hospitals under the Board. This can be accounted for in part on the supposition that certain cases were not submitted for examination, but it is also accounted for partly by the fact that here are included all cases, whether from the Convalescent Hospitals or from Scarlet Fever Hospitals; whilst some slight difference may be accounted for by the fact that I have not taken the calculated number of patients, but the actual cases that have come directly under observation. Then, too, I have necessarily taken the bacteriological diagnosis as our main indication, in order that the bacteriological and clinical (hospital) statistics might be compared.

Summary. In the summary of the whole of the cases examined during 1895 and 1896 in which diphtheria bacilli were found, we find that there were 8,937 cases, with a mortality of 1,755, giving a percentage death-rate of 19·6, ranging between 47·5 in children between one and two years of age and 1·9 in patients over 20 years of age. The numbers of attacks at these two ages are almost equal—469 and 451. It is noteworthy that in the patients attacked between the ages of one and two coming under treatment up to the third day, the death-rate, though slightly less than amongst those treated at a later date, is not so low as we should have anticipated, whilst of those over 20 years of age only one died amongst the patients treated within this period. When antitoxin was given in this latter class of patients, as will be seen from Table XXII. (Summary), every case that died came under treatment on the fourth day or later. From Table XXI. (Summary) also it will be seen that of cases that came under treatment on the first day—756 in all—only 47, or 6·2 per cent., died. Of cases that came under treatment on the second day the percentage mortality was 13·7; this, of course, includes all the mild cases in which it was not thought necessary to give antitoxin.

Mortality in antitoxin cases. Coming now to the cases injected with antitoxin in these various years, the figures for 1894 (Table XXII.) are given simply to complete statistics for future reference. In 1895 and 1896 these same cases in which diphtheria bacilli were found, and which were treated with antitoxin, are given. The figures at the head of the columns indicate the day of the disease, whilst the "?" heading mark indicates that we were able to obtain no information on this point. The number of cases injected in 1895 was 2,068, with 573 deaths, giving a mortality of 27·7 per cent. In 1896 there were 3,341 cases injected, with 744 deaths—mortality, 22·2 per cent. Amongst the cases injected on the first day there was a death-rate of 11·6 per cent. in 1895; in 1896 the death-rate had fallen to 4·4 per cent. On the second day 15·2 in 1895, and 13·7 in 1896. On the third day in 1895 the death-rate is considerably higher, reaching 29·07 per cent.; in 1896 it also rises, though not to the same extent, being then 21·5 per cent. In cases in which antitoxin was first injected at a later period than this, except amongst those in which there was a doubt as to the history, the death-rate never fell below 30 per cent. in 1895, but in 1896 (except in cases in which there was no history) it never reached 30 per cent. Of the cases in which the onset occurred in the hospital, 12·6 per cent. died in 1895, and 12·3 in 1896. It is evident, then, from these figures that, taking the cases under exactly the same conditions, there was a considerable fall in the percentage mortality in 1896; whilst, taking the figures for previous years, we find that even these figures—which, of course, include only the most severe cases of diphtheria, that is, those that bacteriologically were undoubtedly cases of diphtheria, and in which from the clinical point of view it was necessary to inject antitoxin—are considerably lower than the figures including the whole of the cases in former years. For instance, we may compare this death-rate with those of 1893 and 1894, in which the death-rates were 30·3 and 29·6; in 1895 the death-rate, amongst even the severe cases alone, had fallen to 27·7, and in 1896 to 22·2; whilst, as we shall see afterwards, including all cases of diphtheria—that is, those which were not supposed to be sufficiently severe to render the exhibition of antitoxin necessary—the fall in the percentage mortality becomes still more marked.

Summary. Coming now to the summary of the cases in which diphtheria bacilli were found and which were treated with antitoxin—a summary in which, for the sake of argument and statistics, may be included most of the severe cases beyond those actually moribund or past all hope of treatment when they arrived in the hospital—we find that the mortality of cases coming under treatment on the first day is only 6·5 per cent., on the second day 14·3 per cent., whilst the total mortality per cent. of all those cases injected with antitoxin rises to only 24·2 per cent., a figure which compares very favourably indeed with the death-rate amongst all cases, both mild and severe, recorded in 1894, where the deaths amongst 3,042 cases were 902—a mortality of 29·6 per cent., up to that time the lowest ever recorded in the hospitals under the Board. On comparing the death-rates amongst children under five years of age, we find that the improvement is quite as distinctly marked. In all cases of diphtheria in this class, treated with and without antitoxin, the death-rate has fallen to 29·7 per cent., or 1,076 deaths in 3,616 cases, as against 1,171 cases with 556 deaths, or 47·4 per cent.

TABLE XXII.—Percentage Mortality at different ages of cases in which Diphtheria bacilli were found and in which Antitoxic Serum was injected. (In the first line is given the day on which antitoxic serum was injected, reckoning from the appearance of the initial symptoms as reported by the Ambulance Nurse.)

1894.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2 ...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	3	...	0·0
2 ,, 3 ...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	1	1	...	...	4	1	25·0
3 ,, 4 ...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	3	...	0·0
4 ,, 5 ...	...	...	1	...	...	...	1	...	...	...	...	...	1	...	...	...	1	...	...	...	4	...	0·0
5 ,, 10 ...	...	...	1	...	2	...	1	...	...	...	1	...	...	...	...	...	1	1	...	...	6	1	16·6
10 ,, 15 ...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	3	...	0·0
15 ,, 20 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
20 & upwards	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
Total ...	...	...	3	...	4	...	4	...	3	...	1	...	3	...	...	...	6	2	...	...	24	2	...
Mortality per cent.	{	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	33·3	...	...	...	...	8·3

1895.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1 ...	...	...	10	4	7	4	5	2	2	...	5	4	2	1	4	3	...	...	...	...	35	18	51·4
1 to 2 ...	6	4	33	13	27	16	24	17	17	5	17	7	8	6	20	12	6	1	5	3	163	84	51·5
2 ,, 3 ...	5	...	29	4	34	14	33	14	24	9	15	4	6	1	20	9	9	4	6	3	181	62	34·2
3 ,, 4 ...	21	3	36	3	56	18	46	16	34	18	35	13	16	4	23	11	11	1	13	3	291	90	30·9
4 ,, 5 ...	15	3	43	6	52	20	56	24	33	13	24	9	12	7	36	10	12	...	14	6	297	98	32·9
5 ,, 10 ...	48	3	115	14	136	31	139	34	121	29	79	27	43	15	63	19	21	2	28	7	793	181	22·8
10 ,, 15 ...	19	1	37	3	34	3	51	5	23	6	19	4	8	3	12	3	4	...	7	2	214	30	14·01
15 ,, 20 ...	3	...	5	1	10	1	10	1	2	1	3	...	3	...	6	2	...	...	2	1	44	7	15·9
20 & upwards	3	...	6	...	12	...	15	1	4	1	3	...	3	1	2	...	...	...	2	...	50	3	6·0
Total ...	120	14	314	48	368	107	379	114	260	82	200	68	101	38	186	69	63	8	77	25	2068	573	...
Mortality per cent.	}	11·6	...	15·2	...	29·07	...	30·07	...	31·5	...	34·0	...	37·6	...	37·09	...	12·6	...	32·4	...	...	27·7

1896.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1 ...	4	...	6	2	10	5	6	2	11	4	4	1	4	2	7	2	3	1	...	...	55	19	34·5
1 to 2 ...	3	2	33	14	37	14	40	20	22	7	16	9	9	4	16	9	9	4	3	2	188	85	45·2
2 ,, 3 ...	7	2	54	12	54	16	54	24	49	12	29	11	17	4	28	9	11	1	2	1	305	92	30·1
3 ,, 4 ...	35	2	58	4	94	18	78	24	59	18	53	22	24	6	50	16	27	4	4	2	482	116	24·06
4 ,, 5 ...	26	...	59	10	79	20	90	25	79	32	48	10	28	11	56	12	23	4	4	...	492	124	25·2
5 ,, 10 ...	162	6	164	15	227	50	261	55	182	49	124	26	84	27	126	34	54	2	6	2	1390	266	19·1
10 ,, 15 ...	47	1	28	...	52	2	50	11	44	8	27	3	20	2	26	5	8	1	1	1	303	34	11·2
15 ,, 20 ...	7	...	7	...	8	...	5	1	5	2	8	1	4	1	1	...	1	...	...	...	46	5	10·8
20 & upwards	3	...	6	...	20	...	17	1	13	...	11	1	3	...	5	1	2	...	...	...	80	3	3·7
Total ...	294	13	415	57	581	125	601	163	464	132	320	84	193	57	315	88	138	17	20	8	3341	744	...
Mortality per cent.	{	4·4	...	13·7	...	21·5	...	27·1	...	28·4	...	26·2	...	29·5	...	27·9	...	12·3	...	40·0	...	...	22·2

SUMMARY.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per Cent.	
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1 ...	4	0	16	6	17	9	11	4	13	4	9	5	6	3	11	5	3	1	0	0	90	37	41·1	
1 to 2 ...	9	6	66	27	64	30	64	37	39	12	33	16	18	10	36	21	17	5	8	5	354	169	47·7	
2 ,, 3 ...	12	2	83	16	89	30	88	38	74	21	44	15	23	5	48	18	21	6	8	4	490	155	31·6	31·52
3 ,, 4 ...	56	5	94	7	151	36	125	40	94	36	88	35	40	10	73	27	38	5	17	5	776	206	26·5	
4 ,, 5 ...	41	3	103	16	131	40	147	49	112	45	72	19	41	18	92	22	36	4	18	6	793	222	27·9	
5 ,, 10 ...	210	9	280	29	365	81	401	89	303	78	204	53	127	42	189	53	76	5	34	9	2189	448	20·4	
10 ,, 15 ...	66	2	65	3	86	5	101	16	68	14	46	7	29	5	38	8	13	1	8	3	520	64	12·3	
15 ,, 20 ...	10	0	12	1	18	1	15	2	7	3	11	1	7	1	7	2	1	0	2	1	90	12	13·3	
20 & upwards	6	0	13	0	32	0	32	2	17	1	14	1	6	1	7	1	2	0	2	0	131	6	4·5	
Total ...	414	27	732	105	953	232	984	277	727	214	521	152	297	95	501	157	207	27	97	33	5433	1319	..	
Mortality per cent.	}	6·5	...	14·3	...	24·3	...	28·1	...	29·4	...	29·1	...	31·9	...	31·3	...	13·04	...	34·02	...	...	24·2	

Summary (*continued*).

Coming now to the corresponding figures in Table XXII. (Summary), we find that we have 2,503 cases under five years of age in which diphtheria bacilli were found, and of these 789—or 31·52 per cent.—died; so that at the most fatal period, and taking the really severe cases into account, we have an actual fall from 47·4 per cent. to 31·52 per cent., whilst, as we have seen, including those cases which were probably not looked upon as being very severe, but which were nevertheless cases of real diphtheria, the figure had dropped to 29·7 per cent.

TABLE XXIII.—Percentage Mortality at different ages of cases in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected.

	1894.			1895.			1896.		
Ages.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.
Under 1	...	...	0·0	19	4	21·05	19	9	47·3
1 to 2	1	...	0·0	61	28	45·9	53	26	49·05
2 ,, 3	1	...	0·0	142	48	33·8	110	34	30·9
3 ,, 4	5	1	20·0	179	48	26·8	153	30	19·6
4 ,, 5	3	...	0·0	188	30	15·9	179	29	16·2
5 ,, 10	5	...	0·0	653	75	11·4	638	49	7·6
10 ,, 15	3	...	0·0	268	11	4·1	299	6	2·006
15 ,, 20	3	...	0·0	101	4	3·9	101	1	0·9
20 and upwards ...	...	...	0·0	145	3	2·06	175	...	0·0
Total... ...	21	1	4·7	1,756	251	14·2	1,727	184	10·6

Cases not injected with antitoxic serum.

A certain proportion of the cases in which diphtheria bacilli were found were not treated with antitoxin (Table XXIII.). It will be noticed that the majority of these occurred in older patients, and that the death-rate amongst them was comparatively low. One would expect to find, however, if the disease was so mild in these cases, that the death-rate should be very much lower at all ages; but this is not the case: we find, indeed, that the highest mortality attained occurred in patients between one and two years of age—45.9 per cent. in 1895, and 49·05 per cent. in 1896—so that here we have cases which raise the average mortality considerabiy. Amongst these cases—1,756 in number in 1895—there was a mortality of 14·2 per cent., and in 1,727 cases in 1896 a percentage mortality of 10·6. It is evident, therefore, that in 1896, at the later ages, only very mild cases of diphtheria have been left untreated by antitoxin, and it is probable that a certain number of them, at any rate, had practically recovered before they were admitted to hospital. This, of course, is never the case with very young children, of which it is probable that a number were moribund on admission to hospital, when it was, therefore, too late to obtain any good results from injection.

High mortality.

We may here give in tabular form (Table XXIV.) the admissions and case mortality of diphtheria from 1888 to 1898, with the calculated number of admissions and deaths and the percentage case mortality, taken from the Reports of the Medical Superintendents, and compare these figures with the data collected in these tables. The figures are not exactly comparable, and the comparable figures will probably be given elsewhere, but the comparison is sufficiently close to afford an indication of the marked improvement that has taken place during the years 1895 to 1898.

TABLE XXIV.—Metropolitan Asylums Board: Admissions and Case Mortality—Diphtheria—1888 to 1898.

Year.		No. of Admissions.	No. of Deaths.	Percentage Case Mortality.	Year.		No. of Admissions.	No. of Deaths.	Percentage Case Mortality.
Pre-Antitoxin year ...	1888	99	46	46·4	A few cases injected ...	1894	3,042	902	29·6
,, ...	1889	722	275	38·08	Antitoxin year	1895	3,824	824	21·5
,, ...	1890	942	316	33·5	,, ...	1896	5,068	928	18·3
,, ...	1891	1,312	397	30·2	,, ...	1897	5,673	987	17·7
,, ...	1892	2,009	583	29·0	,, ...	1898	6,566	991	13·1
,, ...	1893	2,848	865	30·3					

Marked fall in percentage mortality.

(The figures for 1895 to 1898 do not include a certain number of cases which were clinically diphtheria, although no diphtheria bacilli were found.) Dividing these figures into two sets, we find that from 1888 to 1894—*i.e.*, in the pre-antitoxin and early antitoxin period—we have 10,765 cases, with 3,384 deaths, giving a case mortality of 31·43 per cent.; whilst in the antitoxin period we have in the two years 1895 and 1896 8,892 cases in which diphtheria bacilli were undoubtedly present, with 1,752 deaths, this giving a mortality of 19·7 per cent., or a gross fall of 11·7 per cent.; whilst between the two extremes, leaving 1888 out of account as dealing with too small a number of cases for statistical purposes, we have a fall in the percentage mortality from 38·0 to 18·3—a fall to less than one-half in a period of seven years. If the notified cases are taken as the basis of comparison the result is still more startling. The figures for the years 1897 and 1898 have here been added; with these still more satisfactory results are brought out. In the four years 1895 to 1898, 21,131 cases of diphtheria were treated, with 3,730 deaths, or a mortality of 17·65 per cent.—a fall of nearly 45 per cent.

We now pass to a consideration of the parts affected in cases in which diphtheria bacilli were found. From the figures collected in Table XXV. may be gathered the relative importance of the presence of faucial, faucio-nasal, faucio-laryngeal, faucio-naso-laryngeal, and laryngeal membranes. The 1894 figures are again included simply for the purpose of completing the statistics. In 1895 the figures are sufficiently large to enable one to see at a glance, first, the proportion of laryngeal cases to faucial; secondly, how the age of the case influences the distribution of the membrane; and, thirdly, the effect of this on the mortality. It will be noticed, for example, that from 1 to 5 years of age the proportion of laryngeal cases is comparatively high; at these ages, too, the death-rate is high as regards both the faucial and the laryngeal attacks, but the percentage mortality in the laryngeal cases affected is much higher than in those in which the pharynx only is affected; when the nose is affected along with the larynx and pharynx, the death-rate becomes very high indeed. The figures in these tables, however, speak for themselves. Where the fauces alone are affected we have a death-rate of 12·1 per cent., where the fauces and nares are affected 39·5 per cent., the fauces and larynx 37·3 per cent.; whilst when the fauces, larynx, and nares are all affected the death-rate rises to 62·2 per cent., falling again when the larynx only is affected to 30·7 per cent. It is evident, therefore, that the extent and position of the membrane play a very important part in determining the severity of the disease, this being due in all probability to the amount of toxin producing and the nature and extent of the absorbing area. It may, however, also be an indication of the special susceptibility of the patient. Site of affection.

TABLE XXV.—Table showing the site of the affection in cases in which Diptheria bacilli were found. The total Deaths and percentage Mortality amongst these sets of cases at different ages are also shown.

1894.

Ages.	Cases.						Total.		Deaths.						Total.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	2	1	...	...	1	4	3	1	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	1	1	2	1	...	5	2	3	...	...	...	1	...	1	...	1	0·0	33·3
3 ,, 4	6	...	1	1	...	8	6	2	1	...	...	...	...	1	1	...	16·6	0·0
4 ,, 5	2	2	2	1	...	7	4	3	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	7	3	1	...	...	11	10	1	...	...	1	...	...	1	...	1	0·0	100·0
10 ,, 15	5	1	...	...	...	6	6	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	27	8	6	3	1	45	35	10	1	...	1	1	...	3	1	2	2·8	20·0
Mortality per cent.	...	...	...	...	...	...	...	...	3·7	0·0	16·6	33·3	0·0	6·6	...	...	...	...

1895.

Ages.	Cases.						Total.		Deaths.						Total.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	24	23	4	2	1	54	47	7	9	9	3	1	...	22	18	4	38·2	57·1
1 to 2	85	71	38	19	11	224	156	68	21	43	25	14	6	112	67	45	42·9	66·1
2 ,, 3	163	94	43	17	6	323	257	66	29	44	22	13	2	110	73	37	28·4	56·06
3 ,, 4	257	136	46	19	12	470	393	77	57	52	15	11	3	138	109	29	27·7	37·6
4 ,, 5	273	127	55	22	8	485	400	85	38	60	14	14	2	128	98	30	24·5	35·2
5 ,, 10	1029	300	83	22	12	1446	1329	117	120	101	22	10	3	256	221	35	16·6	29·9
10 ,, 15	407	65	3	5	2	482	472	10	22	16	...	3	...	41	38	3	8·05	30·0
15 ,, 20	138	6	1	...	...	145	144	1	9	1	1	...	...	11	10	1	6·9	100·0
20 and upwards .	185	10	...	...	...	195	195	...	3	3	...	...	...	6	6	...	3·07	0·0
Total	2561	832	273	106	52	3824	3393	431	311	329	102	66	16	824	640	184	18·8	42·6
Mortality per cent.	...	...	...	...	...	...	...	...	12·1	39·5	37·3	62·2	30·7	21·5	...	...	...	...

1896.

Ages.	Cases.						Total.		Deaths.						Total.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	40	27	4	3	...	74	67	7	9	13	4	2	...	28	22	6	32·8	85·7
1 to 2	85	89	36	22	9	241	174	67	28	46	13	16	8	111	74	37	42·5	55·2
2 ,, 3	217	116	59	15	8	415	333	82	49	45	23	6	3	126	94	32	28·2	39·02
3 ,, 4	366	168	71	17	13	635	534	101	66	56	11	7	6	146	122	24	22·8	23·7
4 ,, 5	425	162	61	16	7	671	587	84	54	70	20	8	1	153	124	29	21·1	34·5
5 ,, 10	1451	430	106	30	11	2028	1881	147	135	142	21	15	2	315	277	38	14·7	25·8
10 ,, 15	506	87	8	...	1	602	593	9	22	16	2	...	...	40	38	2	6·4	22·2
15 ,, 20	133	14	...	...	...	147	147	...	1	5	...	...	...	6	6	...	4·08	0·0
20 and upwards ...	239	16	...	...	...	255	255	...	3	...	...	...	...	3	3	...	1·1	0·0
Total	3462	1109	345	103	49	5068	4571	497	367	393	94	54	20	928	760	168	16·6	33·8
Mortality per cent.	...	...	...	...	...	...	...	...	10·6	35·4	27·2	52·4	40·8	18·3	...	...	..	...

Site of affection.

Coming now to 1896, it will be observed that we have practically the same sets of figures throughout, if we look at them from the purely relative point of view, but that, absolutely, the figures indicate a very great improvement. Thus we have in the mortality per cent. of the faucial cases 16·6 against 18·8, and of the laryngeal cases 33·8 against 42·6, in 1895. The deaths amongst the purely faucial cases have fallen from 12·1 to 10·6 per cent., and all the other figures have fallen, with the exception of the laryngeal, in which there is a rise on a small number of cases from 30·7 to 40·8; although, as already seen in previous tables, the total case mortality has fallen from 21·5 to 18·3 per cent.

TABLE XXVI.—Showing the site of the affection in cases in which Diphtheria bacilli were found and Antitoxic Serum was injected. The total Deaths and percentage Mortality amongst these sets of cases at different ages are also shown.

1894.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total. Faucial.	Total. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total. Faucial.	Total. Laryngeal.	Mortality per Cent. Faucial.	Mortality per Cent. Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	2	...	...	...	1	3	2	1	...	...	...	...	...	...	...	...	0·0	0·0
2 „ 3	1	...	2	1	...	4	1	3	...	...	...	1	...	1	...	1	0·0	33·3
3 „ 4	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
4 „ 5	1	1	2	...	...	4	2	2	...	...	...	...	...	...	...	...	0·0	0·0
5 „ 10	3	2	1	...	...	6	5	1	...	...	1	...	...	1	...	1	0·0	100·0
10 „ 15	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
15 „ 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	14	3	5	1	1	24	17	7	...	...	1	1	...	2	...	2	0·0	28·5
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	0·0	20·0	100·0	0·0	8·3	...	...	...	...

1895.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total. Faucial.	Total. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total. Faucial.	Total. Laryngeal.	Mortality per Cent. Faucial.	Mortality per Cent. Laryngeal.
Under 1	13	17	2	2	1	35	30	5	6	9	2	1	...	18	15	3	50·0	60·0
1 to 2	56	54	27	18	8	163	110	53	17	32	17	13	5	84	49	35	44·5	66·03
2 „ 3	82	57	26	12	4	181	139	42	17	25	10	9	1	62	42	20	30·2	47·6
3 „ 4	137	95	35	15	9	291	232	59	28	39	13	7	3	90	67	23	28·8	38·9
4 „ 5	137	95	44	15	6	297	232	65	28	48	11	9	2	98	76	22	32·7	33·8
5 „ 10	499	216	53	17	8	793	715	78	86	74	14	5	2	181	160	21	22·3	26·9
10 „ 15	163	46	1	4	...	214	209	5	13	14	...	3	...	30	27	3	12·9	60·0
15 „ 20	39	4	1	...	...	44	43	1	5	1	1	...	...	7	6	1	13·9	100·0
20 and upwards ...	45	5	...	...	...	50	50	...	1	2	...	...	...	3	3	...	6·0	0·0
Total	1171	589	189	83	36	2068	1760	308	201	244	68	47	13	573	445	128	25·2	41·5
Mortality per cent.	...	...	...	...	...	...	...	...	17·1	41·4	35·9	56·6	36·1	27·7	...	...	...	...

1896.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total. Faucial.	Total. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total. Faucial.	Total. Laryngeal.	Mortality per Cent. Faucial.	Mortality per Cent. Laryngeal.
Under 1	27	22	4	2	...	55	49	6	4	10	4	1	...	19	14	5	28·5	83·3
1 to 2	55	73	33	21	6	188	128	60	18	36	11	15	5	85	54	31	42·1	51·6
2 „ 3	145	88	52	12	8	305	233	72	32	30	23	5	2	92	62	30	26·6	41·6
3 „ 4	252	142	67	14	7	482	394	88	52	46	10	5	3	116	98	18	24·8	20·4
4 „ 5	282	131	56	16	7	492	413	79	40	57	18	8	1	124	97	27	23·4	34·1
5 „ 10	900	359	97	24	10	1390	1259	131	103	130	20	11	2	266	233	33	18·5	25·1
10 „ 15	228	66	8	...	1	303	294	9	16	16	2	...	...	34	32	2	10·8	22·2
15 „ 20	38	8	...	...	...	46	46	...	...	5	...	...	...	5	5	...	10·8	0·0
20 and upwards ...	70	10	...	...	...	80	80	...	3	...	...	...	...	3	3	...	3·7	0·0
Total	1997	899	317	89	39	3341	2896	445	268	330	88	45	13	744	598	146	20·6	32·8
Mortality per cent.	...	...	...	...	...	...	...	...	13·4	36·7	27·7	50·5	33·3	22·2	...	...	...	...

Antitoxin cases.

In Table XXVI. are given similar figures for the three years in the cases in which antitoxin was injected. It is interesting to note in dealing with the tables for 1895 and 1896 that the distribution of the death-rate is now much more equal, the faucio-naso-laryngeal deaths falling in 1895 from 62·2 to 56·6, and in 1896 from 52·4 to 50·5; it is evident, therefore, that there must be a somewhat higher death-rate amongst the similar cases not injected with antitoxin. The only columns in which there is a rise are in those in which, if antitoxin were left out of account, there ought to be a slight fall, as they are amongst the simpler cases where the membrane is less extensive. In consequence of a rise in this group the total death-rate of the injected cases is higher than that over the whole of the cases. This, of course, would be expected, as most of the severe cases are injected, and only the milder cases are left uninjected with antitoxin. In this table, again, the mortality amongst infants is seen to be always much higher in the laryngeal cases than amongst the faucial cases, and it is only when small numbers at the later ages come to be dealt with that there is an apparent departure from this rule. The number of laryngeal cases in the later years is, however, so small that these figures may be left out of account, especially as regards the effect on the general statistics.

TABLE XXVII.—Table showing site of the affection in cases in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected. The total Deaths and percentage Mortality amongst these sets of cases at different ages are also shown.

Ages.	Cases.						Total.		Deaths.						Total.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
1894.																		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	3	...	1	1	...	5	3	2	1	...	...	...	...	1	1	...	33·3	0·0
4 ,, 5	1	1	...	1	...	3	2	1	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	4	1	...	...	...	5	5	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15	2	1	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	13	5	1	2	...	21	18	3	1	...	...	...	...	1	1	...	5·5	0·0
Mortality per cent.	...	...	...	...	...	...	...	...	7·6	0·0	0·0	0·0	0·0	4·7	...	...	...	...
1895.																		
Under 1	11	6	2	...	...	19	17	2	3	...	1	...	...	4	3	1	17·6	50·0
1 to 2	29	17	11	1	3	61	46	15	7	11	8	1	1	28	18	10	39·1	66·6
2 ,, 3	81	37	17	5	2	142	118	24	12	19	12	4	1	48	31	17	26·2	70·8
3 ,, 4	120	41	11	4	3	179	161	18	29	13	2	4	...	48	42	6	26·08	33·3
4 ,, 5	136	32	11	7	2	188	168	20	10	12	3	5	...	30	22	8	13·09	40·0
5 ,, 10	530	84	30	5	4	653	614	39	34	27	8	5	1	75	61	14	9·9	35·8
10 ,, 15	244	19	2	1	2	268	263	5	9	2	...	...	...	11	11	...	4·1	0·0
15 ,, 20	99	2	...	...	...	101	101	...	4	...	...	...	...	4	4	...	3·9	0·0
20 and upwards ...	140	5	...	...	...	145	145	...	2	1	...	...	...	3	3	...	2·06	0·0
Total	1390	243	84	23	16	1756	1633	123	110	85	34	19	3	251	195	56	11·9	45·5
Mortality per cent.	...	...	..	...	...	...	...	...	7·9	34·9	40·4	82·6	18·7	14·2	...	...	...	...
1896.																		
Under 1	13	5	...	1	...	19	18	1	5	3	...	1	...	9	8	1	44·4	100·0
1 to 2	30	16	3	1	3	53	46	7	10	10	2	1	3	26	20	6	43·4	85·7
2 ,, 3	72	28	7	3	...	110	100	10	17	15	...	1	1	34	32	2	32·0	20·0
3 ,, 4	114	26	4	3	6	153	140	13	14	10	1	2	3	30	24	6	17·1	46·1
4 ,, 5	143	31	5	...	...	179	174	5	14	13	2	...	...	29	27	2	15·5	40·0
5 ,, 10	551	71	9	6	1	638	622	16	32	12	1	4	...	49	44	5	7·07	31·2
10 ,, 15	278	21	...	...	...	299	299	...	6	...	...	...	...	6	6	...	2·006	0·0
15 ,, 20	95	6	...	...	...	101	101	...	1	...	...	...	...	1	1	...	0·9	0·0
20 and upwards ...	169	6	...	...	...	175	175	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	1465	210	28	14	10	1727	1675	52	99	63	6	9	7	184	162	22	9·6	42·3
Mortality per cent.	...	...	...	...	...	...	...	...	6·7	30·0	21·4	64·2	70·0	10·6	...	...	...	...

Of the cases in which diphtheria bacilli were found but which were not injected with antitoxin (Table XXVII.), we have already seen that there was a mortality in 1895 of 14·2 per cent., and in 1896 of 10·6 per cent. It would appear, therefore, that amongst these cases there were some of an exceedingly simple character. In those, however, in which not only the fauces but also the larynx and the nares were affected, as might have been anticipated from the consideration of the figures in the previous tables, there has been a very high mortality—in 1895 82·6 per cent., and in 1896 64·2 per cent. At the lower ages, too, the mortality of those cases in which the larynx is affected is still maintained at a very high figure. From the very high mortality that has occurred in the cases that were not injected with antitoxin, it must be concluded that one of two things has happened: either the patients have been so ill when they Cases not treated with antitoxin.

High mortality amongst cases not treated with antitoxin.

were admitted that they were practically moribund before the physician had time to inject antitoxin; or, on the other hand, the patients gave evidence of such slight diphtherial affection that it was considered unnecessary to inject them at the time, whilst afterwards there was such a rapid or marked development of the disease that the patient was carried off exceedingly quickly.* The lower figures in most of the other sets of cases, especially the faucial, were so numerous, however, that the total was pulled down to the figures above mentioned in the two years, and we may assume that these were all of them of an exceedingly mild type, and that only in a few instances did rapid and acute symptoms, sufficiently grave to carry off the patient, supervene.

Table XXVIII.—Showing cases of Diphtheria (at different ages) in which Diphtheria bacilli were found and Antitoxic Serum injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of days in hospital is given under each heading.

1894.

Recoveries.				Deaths.			
Ages.	Number of Cases.	Number of Days.	Average.	Ages.	Number of Cases.	Number of Days.	Average.
Under 1	...	...	...	Under 1	...	...	...
1 to 2	3	426	142·0	1 to 2	...	...	...
2 ,, 3	3	348	116·0	2 ,, 3	1	138	138·0
3 ,, 4	3	326	108·6	3 ,, 4	...	...	...
4 ,, 5	4	390	97·5	4 ,, 5	...	...	...
5 ,, 10	5	528	105·6	5 ,, 10	1	99	99·0
10 ,, 15	3	244	81·3	10 ,, 15	...	...	...
15 ,, 20	...	...	...	15 ,, 20	...	...	...
20 and upwards... ...	1	55	55·0	20 and upwards... ...	...	...	...
Total	22	2,317	105·3	Total	2	237	118·5

1895.

Ages.	Number of Cases.	Number of Days.	Average.	Ages.	Number of Cases.	Number of Days.	Average.
Under 1	17	897	52·7	Under 1	18	219	12·1
1 to 2	79	5,134	64·9	1 to 2	84	1,252	14·9
2 ,, 3	119	8,790	73·8	2 ,, 3	62	1,137	18·3
3 ,, 4	201	14,848	73·8	3 ,, 4	90	1,229	13·6
4 ,, 5	199	15,197	76·3	4 ,, 5	98	1,123	11·4
5 ,, 10	612	43,995	71·8	5 ,, 10	181	1,905	10·5
10 ,, 15	184	12,124	65·9	10 ,, 15	30	422	14·06
15 ,, 20	37	2,259	61·05	15 ,, 20	7	81	11·5
20 and upwards... ...	47	2,216	47·1	20 and upwards... ...	3	12	4·0
Total	1,495	105,460	70·5	Total	573	7,380	12·8

1896.

Ages.	Number of Cases.	Number of Days.	Average.	Ages.	Number of Cases.	Number of Days.	Average.
Under 1	36	2,110	58·6	Under 1	19	180	9·4
1 to 2	103	6,643	64·4	1 to 2	85	1,268	14·9
2 ,, 3	213	14,675	68·8	2 ,, 3	92	1,312	14·2
3 ,, 4	366	28,359	77·4	3 ,, 4	116	1,446	12·4
4 ,, 5	368	28,352	77·04	4 ,, 5	124	1,491	12·02
5 ,, 10	1,123	82,910	73·8	5 ,, 10	266	3,271	12·2
10 ,, 15	268	17,980	67·08	10 ,, 15	34	497	14·6
15 ,, 20	41	2,516	61·3	15 ,, 20	5	80	16·0
20 and upwards... ...	77	4,006	52·02	20 and upwards... ...	3	20	6·6
Total	2,595	187,551	72·2	Total	744	9,565	12·8

Average period in hospital.

In order to determine whether (1) the patients who recovered under the use of antitoxin remained in hospital a longer or shorter period, and (2) whether there was an average prolongation of the course of the disease even in those who died, Table XXVIII. was constructed. The figures for 1894 need scarcely be considered. In 1895 we find that the average number of days in hospital of those who recovered under the antitoxin treatment was 70·5 per patient, and of those who died 12·8; we may assume that here we are dealing with the severe cases. In 1896 the average number of days was 72·2 per patient, whilst the average time between admission to hospital and death in those patients who succumbed to the disease was also 12·8 days. Comparing this table with Table XXIX., in which are given the cases in which diphtheria bacilli were found but in which antitoxin was not used, we find that the duration of stay in the hospital of the milder cases was 58·9 in 1895 and 59·1 in 1896, whilst of the cases that died the disease ran its course in an average of 14·4 days in 1895 and 10·9 in 1896. On going over the cases represented in the second part of this table, it is found that the higher figure in 1895 appears to be due to the fact that a considerable number of cases which were admitted as of a mild type, or were admitted for some other disease, ran into the severer form of diphtheria at a later period; and one cannot help wondering whether, had antitoxin been given early in a certain proportion of these cases, a number

* This is strong evidence in favour of the injection of antitoxin even in apparently mild cases of diphtheria. It is impossible to say which of the mild cases may not at any time develop a more grave form of the disease.

of them, at any rate, might never have developed the severer type of the disease. The fall of the average in 1896 appears to be due to the fact that in this year a much larger proportion of the mild cases of diphtheria were injected, whilst the admission of a number of moribund cases (in which it was thought futile to inject antitoxin) was comparatively high. The figures in these tables, however, speak for themselves, and require little comment.

TABLE XXIX.—Showing cases of Diphtheria (at different ages) in which Diphtheria bacilli were found but no Antitoxic Serum was injected. These cases are placed under two headings —Recoveries and Deaths—and the average number of days in hospital is given under each heading.

1894.

Recoveries.				Deaths.			
Ages.	Number of Cases.	Number of Days.	Average.	Ages.	Number of Cases.	Number of Days.	Average.
Under 1	...	...	...	Under 1	...	...	...
1 to 2	1	194	194·0	1 to 2	...	...	...
2 ,, 3	1	182	182·0	2 ,, 3	...	...	...
3 ,, 4	4	489	122·2	3 ,, 4	1	106	106·0
4 ,, 5	3	209	69·6	4 ,, 5	...	...	...
5 ,, 10	5	587	117·4	5 ,, 10	...	...	...
10 ,, 15	3	312	104·0	10 ,, 15	...	...	...
15 ,, 20	3	324	108·0	15 ,, 20	...	...	...
20 and upwards	...	...	...	20 and upwards	...	...	...
Total...	20	2,297	114·8	Total...	1	106	106·0

1895.

Recoveries.				Deaths.			
Ages.	Number of Cases.	Number of Days.	Average.	Ages.	Number of Cases.	Number of Days.	Average.
Under 1	15	732	48·8	Under 1	4	35	8·7
1 to 2	33	2,199	66·6	1 to 2	28	419	14·9
2 ,, 3	94	6,255	66·5	2 ,, 3	48	812	16·9
3 ,, 4	131	8,781	67·03	3 ,, 4	48	674	14·04
4 ,, 5	158	10,831	68·5	4 ,, 5	30	251	8·3
5 ,, 10	578	37,169	64·3	5 ,, 10	75	1,177	15·6
10 ,, 15	257	12,407	48·2	10 ,, 15	11	161	14·6
15 ,, 20	97	3,957	40·7	15 ,, 20	4	45	11·2
20 and upwards	142	6,326	44·5	20 and upwards	3	46	15·3
Total...	1,505	88,657	58·9	Total...	251	3,620	14·4

1896.

Recoveries.				Deaths.			
Ages.	Number of Cases.	Number of Days.	Average.	Ages.	Number of Cases.	Number of Days.	Average.
Under 1	10	584	58·4	Under 1	9	158	17·5
1 to 2	27	1,654	61·2	1 to 2	26	216	8·3
2 ,, 3	76	5,176	68·1	2 ,, 3	34	353	10·3
3 ,, 4	123	8,511	69·1	3 ,, 4	30	309	10·3
4 ,, 5	150	10,371	69·1	4 ,, 5	30	346	11·5
5 ,, 10	589	37,362	63·4	5 ,, 10	48	511	10·6
10 ,, 15	293	15,533	53·01	10 ,, 15	6	114	19·0
15 ,, 20	100	4,830	48·3	15 ,, 20	1	4	4·0
20 and upwards	175	7,245	41·4	20 and upwards	...	...	...
Total...	1,543	91,266	59·1	Total...	184	2,011	10·9

TABLE XXX.—Showing percentage Mortality at different ages of cases in which Diphtheria bacilli were found, in which "Tracheotomy" was performed, and in which Antitoxic Serum was injected.

	1894.			1895.			1896.		
Ages.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.
Under 1	...	...	0·0	4	3	75·0	3	2	66·6
1 to 2	1	...	0·0	39	26	66·6	31	20	64·5
2 ,, 3	...	...	0·0	27	12	44·4	41	21	51·2
3 ,, 4	...	...	0·0	38	18	47·3	42	12	28·5
4 ,, 5	1	...	0·0	37	16	43·2	40	18	45·0
5 ,, 10	1	1	100·0	44	13	29·5	65	19	29·2
10 ,, 15	...	...	0·0	2	2	100·0	6	3	50·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards ...	...	...	0·0	...	...	0·0	...	...	0·0
Total.. ...	3	1	33·3	191	90	47·1	228	95	41·6

Tracheotomy Cases.

It has already been pointed out that in a considerable number of cases of diphtheria the larynx is affected, and it has been thought advisable to take out all those cases in which diphtheria bacilli have been found and in which antitoxin had been injected before or after tracheotomy was performed. In 1895 (Table XXX.) there were 191 (with 90 deaths) of such cases, in which tracheotomy was performed. Here we have a mortality of 47·1 per cent. In 1896 the number of tracheotomies had risen to 228, but the deaths had risen to only 95, giving a mortality of 41·6 per cent. Of the cases in which diphtheria bacilli were found but in which no antitoxin was given (Table XXXI.), there were in 1895 50, with 29 deaths, giving a mortality of 58 per cent.; in 1896, 18, with 9 deaths, or 50 per cent. It is thus evident that in 1896 antitoxin has been given in a much larger proportion of cases than in 1895, otherwise we should not have such a small number of cases of tracheotomy in which antitoxin has not been given. It may be well to compare the results obtained in 1896 with those obtained in 1894. In 1894 there were 261 tracheotomies out of 3,042 cases, with 184 deaths—a mortality of 70·4 per cent. of the cases operated on. In 1896 there were 246 cases of tracheotomy out of 5,068 cases, with 104 deaths, or 41·46 per cent., as compared with 70·4 per cent. in 1894. These figures, however, do not accurately represent the gain, as regards tracheotomy, in the cases treated with antitoxin; for we find that, had tracheotomy been necessary in the same proportion of cases in 1896 as in 1894, we should have had 467·7 instead of 246, whilst, if the deaths amongst these had been in the same proportion, there would have been 329·7 instead of 104; so that the saving of life on tracheotomy cases alone would, on this calculation, amount to 225.

Table XXXI.—Showing percentage Mortality at different ages of cases in which Diphtheria bacilli were found, in which Tracheotomy was performed but no Antitoxic Serum was injected.

	1894.			1895.			1896.		
Ages.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.
Under 1	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2	...	...	0·0	11	8	72·7	3	3	100·0
2 ,, 3	...	...	0·0	12	8	66·6	3	...	0·0
3 ,, 4	2	1	50·0	9	5	55·5	5	3	60·0
4 ,, 5	...	...	0·0	2	1	50·0	3	1	33·3
5 ,, 10	...	...	0·0	14	7	50·0	4	2	50·0
10 ,, 15	...	...	0·0	2	...	0·0	...	...	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards ...	...	...	0·0	...	...	0·0	...	...	0·0
Total... ...	2	1	50·0	50	29	58·0	18	9	50·0

Complications of Diphtheria.

In Table XXXII. are given the number of complications noted on the charts in cases admitted in 1895 and 1896; in each one there is a full statement of the complications occurring in the cases in which diphtheria bacilli were found. In 1894, amongst the infected cases there were 11 cases in which albuminuria occurred—45·8 per cent.; 3 with vomiting—12·5 per cent. In one the urine was scanty. There was 1 case of adenitis, 1 case of suppurating cellulitis—4·1 per cent. in each group; and 2 cases of otitis—8·3 per cent. These figures are given merely to complete the statistics. In 1895, in the cases in which antitoxin was injected, it will be noticed that the percentage in which albuminuria occurred ranged from 30·3 in the Western Hospital to 68·6 in the South-Western. From this it must be argued that there was either a very great difference in the type of the disease, in the care with which albumen was looked for, or in the amount of albumen that was looked upon as indicating the albuminuric condition. It must be noted, however, that in 1895 the albuminuria amongst the severe cases when antitoxin was injected was less than 50 per cent. over all, or less than the proportion given by many observers as occurring in cases of diphtheria in the pre-antitoxin period. In 1896 the percentage is still a fraction below 50 per cent.—49·6. It is interesting to notice that in the cases in which no antitoxin was injected (Table XXXIII.), the majority of which were of a comparatively mild type, the percentage of cases suffering from albuminuria was still 30·6 in 1895, and 28·08 in 1896. Amongst the cases in 1894 there were 6 cases of albuminuria—28·5 per cent.; 2 cases of vomiting—9·5 per cent.; 1 case of anuria—4·7 per cent.; 2 cases of nephritis—9·5 per cent.; and 5 cases of adenitis, or a percentage of 23·8. It is evident from these figures that antitoxin can have little, if any, effect in raising the percentage of cases of albuminuria; whilst, through its action in cutting short the disease in cases in which it is given at an early stage, we are justified in assuming that it actually diminishes the percentage of cases of albuminuria, and Roux's recommendation to give antitoxin until the albuminuria begins to diminish is certainly justified by these figures.

Albuminuria.

Vomiting.

On considering the complication of vomiting, it is at once evident that the type of the disease in which antitoxin is being given is of a much more severe type than that in which it has not been thought necessary to exhibit this substance. For instance, it will be noticed that in 1895 the percentage of cases afterwards injected with antitoxin, in which there was vomiting, was 14·2 per cent.; in 1896 the percentage had risen to 21·4; whilst of the cases in which no antitoxin was injected we find that only 7·8 per cent. were affected with vomiting in 1895, ard 7·9 in 1896.

Table XXXII.—Showing Complications occurring in cases in which Diphtheria bacilli were found and Antitoxic Serum was injected. The second column under each heading gives the percentage of these cases on all cases injected with antitoxic serum.

1895.

Hospitals.	Albuminuria.	Percentage on all cases injected with Antitoxic Serum.	Vomiting.	Percentage on all cases injected with Antitoxic Serum.	Anuria.	Percentage on all cases injected with Antitoxic Serum.	Urine Scanty.	Percentage on all cases injected with Antitoxic Serum.	Adenitis.	Percentage on all cases injected with Antitoxic Serum.	Nephritis.	Percentage on all cases injected with Antitoxic Serum.	Joint Pains.	Percentage on all cases injected with Antitoxic Serum.	Injection Abscess.	Percentage on all cases injected with Antitoxic Serum.	Cellulitis of Neck.	Percentage on all cases injected with Antitoxic Serum.	Pyrexia.	Percentage on all cases injected with Antitoxic Serum.	Otitis.	Percentage on all cases injected with Antitoxic Serum.	Cellulitis other than in Neck.	Percentage on all cases injected with Antitoxic Serum.	Mastoid Abscess.	Percentage on all cases injected with Antitoxic Serum.	Axillary Abscess.	Percentage on all cases injected with Antitoxic Serum.	Tonsillar Abscess.	Percentage on all cases injected with Antitoxic Serum.	Articular Abscess.	Percentage on all cases injected with Antitoxic Serum.
Fountain ...	132	45·9	39	13·5	5	1·7	2	0·6	51	17·7	10	3·4	1	0·3	4	1·3	2	0·6	2	0·6	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
Western ...	125	30·3	58	14·07	13	3·1	1	0·2	86	20·8	9	2·1	19	4·6	5	1·2	9	2·1	11	2·6	9	2·1	2	0·4	...	0·0	1	0·2	...	0·0	...	0·0
Eastern ...	158	52·3	60	19·8	24	7·9	13	4·3	10	3·3	2	0·6	2	0·6	...	0·0	11	3·6	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
South-Eastern	212	50·4	97	23·09	2	0·4	4	0·9	7	1·6	7	1·6	...	0·0	1	0·2	3	0·7	...	0·0	2	0·4	2	0·4	...	0·0	...	0·0	1	0·2	...	0·0
South-Western	208	68·6	6	1·9	8	2·6	...	0·0	33	10·8	4	1·3	20	6·6	13	4·2	5	1·6	8	2·6	2	0·6	...	0·0	1	0·3	...	0·0	...	0·0	...	0·0
North-Western	131	47·6	30	10·9	10	3·6	6	2·1	55	20·0	...	0·0	4	1·4	4	1·4	6	2·1	1	0·3	...	0·0	1	0·3	...	0·0	3	1·09	...	0·0	1	0·3
Northern ...	25	36·2	5	7·2	...	0·0	...	0·0	3	4·3	1	1·4	1	1·4	...	0·0	1	1·4	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
Total ...	991	47·9	295	14·2	62	2·9	26	1·2	245	11·8	33	1·5	47	2·2	27	1·3	37	1·7	22	1·06	13	0·6	5	0·2	1	0·04	4	0·1	1	0·04	1	0·04

1896.

Hospitals.	Albuminuria.	Percentage on all cases injected with Antitoxic Serum.	Vomiting.	Percentage on all cases injected with Antitoxic Serum.	Anuria.	Percentage on all cases injected with Antitoxic Serum.	Urine Scanty.	Percentage on all cases injected with Antitoxic Serum.	Adenitis.	Percentage on all cases injected with Antitoxic Serum.	Nephritis.	Percentage on all cases injected with Antitoxic Serum.	Joint Pains.	Percentage on all cases injected with Antitoxic Serum.	Injection Abscess.	Percentage on all cases injected with Antitoxic Serum.	Cellulitis of Neck.	Percentage on all cases injected with Antitoxic Serum.	Pyrexia.	Percentage on all cases injected with Antitoxic Serum.	Otitis.	Percentage on all cases injected with Antitoxic Serum.	Cellulitis other than in Neck.	Percentage on all cases injected with Antitoxic Serum.	Mastoid Abscess.	Percentage on all cases injected with Antitoxic Serum.	Axillary Abscess.	Percentage on all cases injected with Antitoxic Serum.	Tonsillar Abscess.	Percentage on all cases injected with Antitoxic Serum.	Articular Abscess.	Percentage on all cases injected with Antitoxic Serum.
Fountain ...	355	55·6	138	21·6	15	2·3	4	0·6	94	14·7	4	0·6	24	3·7	10	1·5	2	0·3	25	3·9	8	1·2	11	1·7	3	0·4	...	...	...	...	...	...
Western ...	182	29·6	164	26·7	12	1·9	7	1·1	41	6·6	3	0·4	38	6·1	12	1·9	8	1·3	49	7·9	35	5·7	3	0·4	...	0·0	...	...	...	...	...	...
Eastern ...	270	54·9	92	18·5	30	6·1	51	10·3	4	0·8	7	1·4	20	4·07	1	0·2	7	1·4	4	0·8	2	0·4	...	0·0	2	0·4	...	...	...	...	...	...
South-Eastern	341	66·9	143	28·09	2	0·3	3	0·5	15	2·9	...	0·0	16	3·1	5	0·9	1	0·1	4	0·7	...	0·0	...	0·0	...	0·0	...	...	...	...	...	...
South-Western	174	55·9	78	25·08	2	0·6	...	0·0	29	9·3	1	0·3	23	7·3	6	1·9	3	0·9	3	0·9	...	0·0	...	0·0	...	0·0	...	...	...	...	...	...
North-Western	206	58·1	61	17·2	28	7·9	36	10·1	103	29·09	...	0·0	3	0·8	2	0·5	3	0·8	4	1·1	2	0·5	...	0·0	...	0·0	...	...	...	...	...	...
North-Eastern	14	77·7	4	22·2	1	5·5	2	11·1	...	0·0	...	0·0	...	0·0	...	0·0	2	11·1	2	11·1	...	0·0	...	0·0	...	0·0	...	...	...	...	...	...
Brook	53	30·9	29	16·9	4	2·3	6	3·5	6	3·5	1	0·5	7	4·09	...	0·0	...	0·0	1	0·5	...	0·0	...	0·0	...	0·0	...	...	...	...	...	...
Northern ...	55	30·7	3	1·6	...	0·0	1	0·5	...	0·0	...	0·0	7	3·9	...	0·0	1	0·5	...	0·0	2	1·1	...	0·0	...	0·0	...	...	...	...	...	...
Gore Farm ...	8	14·03	5	8·7	...	0·0	...	0·0	1	1·7	...	0·0	1	1·7	...	0·0	1	1·7	...	0·0	...	0·0	...	0·0	...	0·0	...	...	...	...	...	...
Total ...	1658	49·6	717	21·4	94	2·8	110	3·2	293	8·7	16	0·4	139	4·1	36	1·07	28	0·8	92	2·7	49	1·4	14	0·4	5	0·1	...	...	...	...	...	...

TABLE XXXIII.—Showing Complications occurring in cases in which Diphtheria bacilli were found and no Antitoxic Serum was injected. The second column under each heading gives the percentage of the cases on all cases in which no antitoxic serum was injected.

1895.

Hospitals.	Albuminuria.	Percentage on all cases not injected with Antitoxic Serum.	Vomiting.	Percentage on all cases not injected with Antitoxic Serum.	Anuria.	Percentage on all cases not injected with Antitoxic Serum.	Urine Scanty.	Percentage on all cases not injected with Antitoxic Serum.	Adenitis.	Percentage on all cases not injected with Antitoxic Serum.	Nephritis.	Percentage on all cases not injected with Antitoxic Serum.	Joint Pains.	Percentage on all cases not injected with Antitoxic Serum.	Cervical Abscess.	Percentage on all cases not injected with Antitoxic Serum.	Pyrexia.	Percentage on all cases not injected with Antitoxic Serum.	Otitis.	Percentage on all cases not injected with Antitoxic Serum.	Cellulitis other than in Neck.	Percentage on all cases not injected with Antitoxic Serum.	Mastoiditis.	Percentage on all cases not injected with Antitoxic Serum.	Abscess at Back.	Percentage on all cases not injected with Antitoxic Serum.
Fountain	132	33·0	21	5·2	3	0·7	2	0·5	43	1·07	8	2·0	...	0·0	1	0·2	5	1·2	...	0·0	...	0·0	1	0·2	...	0·0
Western	18	9·5	8	4·2	1	0·5	...	0·0	19	10·05	3	1·5	1	0·5	1	0·5	2	1·05	...	0·0	...	0·0	...	0·0	...	0·0
Eastern	146	35·9	74	18·2	18	4·4	6	1·4	12	2·9	12	2·9	3	0·7	14	3·4	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
South-Eastern	20	21·2	1	1·06	...	0·0	...	0·0	7	7·4	...	0·0	...	0·0	...	0·0	...	0·0	1	1·06	1	1·06	...	0·0	...	0·0
South-Western	41	29·07	...	0·0	...	0·0	...	0·0	1	0·7	...	0·0	1	0·7	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	0·7
North-Western	131	37·8	21	6·06	7	2·02	5	1·4	49	14·1	8	2·3	...	0·0	13	3·7	...	0·0	...	0·0	2	0·5	...	0·0	...	0·0
North-Eastern	30	51·7	4	6·8	...	0·0	...	0·0	6	10·3	7	12·06	...	0·0	1	1·7	...	0·0	3	5·1	...	0·0	...	0·0	...	0·0
Northern	21	17·2	9	7·3	...	0·0	...	0·0	2	1·6	2	1·6	...	0·0	...	0·0	...	0·0	3	2·4	...	0·0	...	0·0	...	0·0
Total	539	30·6	138	7·8	29	1·6	13	0·7	139	7·9	40	2·2	5	0·2	30	1·7	7	0·3	7	0·3	3	0·1	1	0·05	1	0·05

1896.

Hospitals.	Albuminuria.	Percentage on all cases not injected with Antitoxic Serum.	Vomiting.	Percentage on all cases not injected with Antitoxic Serum.	Anuria.	Percentage on all cases not injected with Antitoxic Serum.	Urine Scanty.	Percentage on all cases not injected with Antitoxic Serum.	Adenitis.	Percentage on all cases not injected with Antitoxic Serum.	Nephritis.	Percentage on all cases not injected with Antitoxic Serum.	Joint Pains.	Percentage on all cases not injected with Antitoxic Serum.	Cervical Abscess.	Percentage on all cases not injected with Antitoxic Serum.	Pyrexia.	Percentage on all cases not injected with Antitoxic Serum.	Otitis.	Percentage on all cases not injected with Antitoxic Serum.	Cellulitis other than in Neck.	Percentage on all cases not injected with Antitoxic Serum.	Mastoiditis.	Percentage on all cases not injected with Antitoxic Serum.	Abscess at Back.	Percentage on all cases not injected with Antitoxic Serum.
Fountain	100	32·6	17	5·5	3	0·9	1	0·3	20	6·5	2	0·6	4	1·3	2	0·6	5	1·6	3	0·9	...	...	1	0·3	...	...
Western	22	8·1	30	11·07	...	0·0	2	0·7	7	2·5	1	0·3	4	1·4	...	0·0	15	5·5	6	2·2	...	...	...	0·0	...	...
Eastern	61	26·06	14	5·9	2	0·8	4	1·7	2	0·8	6	2·5	1	0·4	3	1·2	1	0·4	2	0·8	...	...	...	0·0	...	...
South-Eastern	84	43·9	16	8·3	...	0·0	...	0·0	6	3·1	...	0·0	2	1·04	1	0·5	...	0·0	...	0·0	...	...	...	0·0	...	...
South-Western	39	22·9	10	5·8	...	0·0	...	0·0	3	1·7	...	0·0	1	0·5	...	0·0	...	0·0	...	0·0	...	...	...	0·0	...	...
North-Western	160	42·4	47	12·4	12	3·1	17	4·5	59	15·6	1	0·2	1	0·2	5	1·3	1	0·2	1	0·2	...	...	...	0·0	...	...
North-Eastern	4	13·7	3	10·3	1	3·4	...	0·0	...	0·0	1	3·4	...	0·0	...	0·0	3	10·3	1	3·4	...	...	...	0·0	...	...
Brook	7	13·2	...	0·0	...	0·0	...	0·0	1	1·8	...	0·0	...	0·0	...	0·0	1	1·8	...	0·0	...	...	...	0·0	...	...
Northern	4	5·5	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	...	...	0·0	...	...
Gore Farm...	4	16·6	...	0·0	...	0·0	...	0·0	1	4·1	...	0·0	...	0·0	...	0·0	1	4·1	...	0·0	...	...	...	0·0	...	...
Total	485	28·08	137	7·9	18	1·04	24	1·3	99	5·7	11	0·6	13	0·7	11	0·6	27	1·5	13	0·7	...	...	1	0·05	...	...

Of cases returned as suffering from anuria and treated with antitoxin we have in 1895 2·9 per cent., and in 1896 2·8 per cent.; of cases treated without antitoxin—including, of course, all cases coming in moribund, but also including the very mild cases in which it was not thought necessary to inject antitoxin—we have 1·6 per cent. suffering from anuria in 1895, and 1·04 in 1896. Perhaps under this head should come those cases in which the urine was said to be scanty. In 1895 the number of such cases was 1·2 per cent. injected with antitoxin, and 0·7 per cent. treated without antitoxin; in 1896 the figures are 3·2 per cent. with antitoxin, and 1·3 without antitoxin. Complications. Anuria.

Coming now to adenitis—one of the symptoms by which the activity of the poison and the severity of the complications may be more accurately measured than perhaps by almost any other single symptom or lesion—it is found that there is a distinct fall in the number of cases in which this condition occurred, even in 1895. Thus, in 1895, of cases treated with antitoxin, 11·8 suffered from adenitis, whilst in 1896 there were only 8·7 per cent. Of the cases treated without antitoxin, we find that in 1895 7·9 suffered from adenitis, and in 1896 5·7 per cent. Adenitis.

The next set of figures is one which, from certain points of view, is exceedingly unsatisfactory as an indication of the severity of the disease, as it would appear, from a careful examination of the statistics from the different hospitals, that a very different meaning is given to the term "nephritis" by different Medical Officers. Still, taking the average, the same results, or approximately the same results, should be obtained in both years; or, rather, it is allowable to put the same interpretation on the two sets of figures. In 1895, when antitoxin was not being given to the same extent as in 1896, the percentage number of cases of nephritis over the whole of the cases admitted and found to have diphtheria bacilli in the throat was 1·5; whilst of those cases in which antitoxin was not given—including, of course, certain scarlatinal cases—2·2 per cent. suffered from nephritis. In 1896, although the number of cases of nephritis had fallen very considerably, so that there was a percentage of only 0·4 over the whole of the cases, there was again a slightly higher percentage of cases in which nephritis occurred amongst the uninjected cases—0·6. It is evident, then, that nephritis has occurred more frequently amongst the uninjected cases than amongst the cases treated with antitoxin—a most significant fact in view of the strenuous objections that were raised to the use of antitoxin, on the ground that it was sure to increase kidney complications. Whether we take albuminuria, anuria, scanty urine, or nephritis, or the whole of them together, we find that the number of cases in which kidney mischief is observed does not rise beyond the numbers previously observed; whilst, if we take the severer forms of kidney disease, the fall has been so marked that it forms one of the most significant features in the whole of the present series of observations. Nephritis.

Joint pains are by no means confined to cases in which antitoxin has been injected, although it is undoubtedly the fact that they are more numerous in those patients treated with antitoxin than in those not so treated. Here, however, it must be borne in mind, as has previously been frequently insisted upon, that those cases in which antitoxin was not given were, taking them on the whole, of a much milder type than those that it was considered necessary to inject. In 1895 2·2 per cent. of the cases were affected with joint pains, but amongst those not injected there were only 0·2 per cent. In 1896, amongst the whole of the cases we had joint pains in a proportion of 4·1 per cent., whilst amongst those not injected there were only 0·7 per cent. It is evident here that we have a rise in the number of joint pains not only amongst the injected cases, but also amongst the uninjected cases. It is just possible, of course, that some of this difference may be due to the greater care with which joint pains have been recorded in the latter year; though, in view of the fact that a larger quantity of antitoxin is being used, this can scarcely be held to account for the whole of the increase. Joint pains.

The number of injection abscesses is small, but one would like to see this number still further diminished; for it may be noted that at certain hospitals the number of abscesses has been very small—notably the Northern, where not a single injection abscess has occurred during two years in which antitoxin has been used, and at the Eastern Hospital, where there has been only one abscess during the same period. Of course the formation of an abscess in certain cases appears to be unavoidable; but from the fact that they appear to occur in series in one hospital, and are entirely absent in another, "local" conditions would appear to have something to do with their occurrence. It must be noted that these figures do not correspond with those given in the Report of the Medical Superintendents for 1895, who report 52 cases of "abscess at the site of injection," giving an average of 2·3 per cent., whilst we note only 31, with an average of about 1·2 per cent. The higher figure must be accepted as correct, as the Superintendents, naturally, had access to details with which we were not supplied in that year. In 1896 our figures come out at 42 cases of abscess, whilst in the Board's statistics there are only 35. It is evident, then, that our statistics for 1896 are, so far as this factor goes, much more reliable than those of 1895, but it may be accepted as beyond doubt that the fall in the percentage number of cases of injection abscess has been considerable. Injection abscesses.

The number of cervical abscesses that occurred may afford some indication as to the severity of the disease in the later stages, or, rather, as to the complicating conditions. In 1895, amongst all the cases treated 1·7 per cent. suffered from cervical abscess; whilst in the cases in which antitoxin was not used, and which presumably, therefore, were somewhat milder to begin with, the same percentage—namely, 1·7—still holds good. In 1896 the percentage had fallen over the whole of the cases to 0·8: in this year antitoxin had been used much more generally, especially in the more severe cases; amongst the non-antitoxin cases there was a still further slight fall, the percentage being 0·6. Cervical abscesses.

As regards pyrexia, there was in 1895 a percentage of cases in which it occurred equal to 1·06 over all cases. This figure, however, is probably too low, as the records were not collected during the early part of the year; in 1896 the percentage was 2·7—certainly a much more Pyrexia.

accurate figure, as careful note had been kept of each case in which pyrexia had occurred. For the cases in which no antitoxin was given, the figure in 1895 is 0·3, and in 1896 1·5 per cent. It may be, of course, that the higher figures are due to a different system of recording, or perhaps to more careful observation, as the rise is not only over the whole cases, but also in those not injected with antitoxin.

With regard to the other complications, we find that they occur in a greater proportion of case in 1896 than in 1895.

Cases Moribund on Admission.

Table XXXIV.—Showing the number of cases Moribund on admission in which Diphtheria bacilli were found and in which Antitoxic Serum was injected. These died within 48 hours of admission to Hospital. In the second column under each heading is given the percentage proportion of these cases to the whole of those injected with antitoxic serum.

Ages.	Under 1.		1 to 2.		2 to 3.		3 to 4.		4 to 5.		5 to 10.		10 to 15.		15 to 20.		20 and upwards.		Total.	
Hospitals.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.
1895.																				
Fountain	...	0·0	1	5·8	2	6·6	3	7·1	...	0·0	2	1·9	...	0·0	...	0·0	...	0·0	8	2·7
Western	1	14·2	...	0·0	...	0·0	6	8·9	5	7·8	3	1·9	...	0·0	...	0·0	...	0·0	15	3·6
Eastern	1	25·0	...	0·0	2	7·6	...	0·0	4	9·5	3	2·7	...	0·0	...	0·0	...	0·0	10	3·3
South-Eastern	...	0·0	4	14·2	1	2·3	2	4·7	7	11·6	5	2·9	...	0·0	...	0·0	...	0·0	19	4·5
South-Western	...	0·0	2	7·6	3	12·0	...	0·0	2	4·5	2	1·5	...	0·0	...	0·0	1	20·0	10	3·3
North-Western	...	0·0	3	9·6	2	9·5	3	6·5	2	6·6	3	3·2	...	0·0	2	28·5	1	6·6	16	5·8
Total...	2	5·7	10	6·1	10	5·5	14	4·8	20	6·7	18	2·2	...	0·0	2	4·5	2	4·5	78	3·7
1896.																				
Fountain	...	0·0	1	2·8	...	0·0	3	3·3	1	1·04	3	1·08	...	0·0	...	0·0	...	0·0	8	1·2
Western	...	0·0	2	4·5	7	9·09	2	2·08	1	1·1	5	2·2	...	0·0	...	0·0	...	0·0	17	2·7
Eastern	1	12·5	...	0·0	2	4·4	4	5·1	1	1·3	3	1·5	...	0·0	...	0·0	...	0·0	11	2·2
South-Eastern	1	6·6	2	6·06	1	1·9	6	7·7	4	4·7	3	1·5	2	4·8	...	0·0	1	11·1	20	3·9
South-Western	1	12·5	...	0·0	1	4·0	1	3·5	1	2·4	5	3·3	...	0·0	...	0·0	...	0·0	9	2·8
North-Western	1	25·0	2	7·6	4	10·8	2	3·3	4	7·2	5	3·2	1	6·2	...	0·0	...	0·0	19	5·3
Brook	...	0·0	1	7·6	...	0·0	2	8·3	...	0·0	3	4·1	...	0·0	...	0·0	...	0·0	6	3·5
Total	4	7·2	8	4·2	15	4·9	20	4·1	12	2·4	27	1·9	3	0·9	...	0·0	1	1·2	90	2·6

Table XXXV.—Showing the number of cases Moribund on admission, in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected. These died within 48 hours of admission to Hospital. In the second column under each heading is given the percentage proportion of these cases to the whole of those in which no antitoxic serum was injected.

Ages.	Under 1.		1 to 2.		2 to 3.		3 to 4.		4 to 5.		5 to 10.		10 to 15.		15 to 20.		20 and upwards.		Total.	
Hospitals.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.
1895.																				
Fountain	...	0·0	2	10·0	...	0·0	...	0·0	...	0·0	...	0·0	1	1·5	...	0·0	...	0·0	3	0·7
Western	...	0·0	2	40·0	...	0·0	...	0·0	...	0·0	1	1·9	...	0·0	...	0·0	1	2·6	4	2·1
Eastern	1	33·3	3	30·0	1	2·8	1	2·8	2	4·08	2	1·4	...	0·0	...	0·0	...	0·0	10	2·4
South-Eastern	...	0·0	1	25·0	2	33·3	...	0·0	...	0·0	3	8·8	...	0·0	...	0·0	...	0·0	6	6·3
North-Western	..	0·0	1	5·5	1	2·8	2	4·08	3	8·1	6	4·3	1	10·8	...	0·0	...	0·0	14	4·04
Total	1	5·2	9	14·7	4	2·8	3	1·6	5	2·6	12	1·8	2	0·7	...	0·0	1	0·6	37	2·1
1896.																				
Fountain	...	0·0	4	33·3	...	0·0	...	0·0	1	3·8	2	1·5	...	0·0	...	0·0	...	0·0	7	2·2
Western	1	100·0	1	11·1	3	20·0	...	0·0	1	3·5	...	0·0	1	2·0	1	4·7	...	0·0	8	2·9
Eastern	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	2	2·2	...	0·0	...	0·0	...	0·0	2	0·8
South-Eastern	1	20·0	1	14·2	1	4·7	1	8·3	1	5·0	2	3·2	...	0·0	...	0·0	...	0·0	7	3·6
South-Western	...	0·0	1	25·0	...	0·0	...	0·0	1	20·0	...	0·0	...	0·0	...	0·0	...	0·0	2	1·1
North-Western	...	0·0	2	16·6	3	7·1	3	6·8	2	3·3	5	3·5	...	0·0	...	0·0	...	0·0	15	3·9
Total	2	10·5	9	16·9	7	6·3	4	2·6	6	3·3	11	1·7	1	0·3	1	0·9	...	0·0	41	2·3

Tables XXXIV. and XXXV. contain a record of the figures of all the cases that came into hospital moribund, including all those that died within 48 hours of admission to hospital. Of course the majority of these died within 24 hours; still, owing to the system of dating the cases, it is impossible to obtain any more definite statement as to the time the patients remained in hospital before they died. Of this class of case, by far the largest number occurred at the North-Western Hospital, and the large proportion of moribund cases must be held to account—in part, at any rate—for the comparatively high death-rate amongst the cases admitted to that hospital. The same also holds of the South-Eastern Hospital, where, however, the general death-rate is not quite so high as at the North-Western. It will be noticed that a certain proportion of the cases were looked upon as being so severe at the very outset that they were not even injected, and it must be concluded that these patients died within a few hours of admission to hospital from the severity of the primary toxic symptoms, or that they succumbed to heart failure or other paralytic mischief in the later stages of the disease, being only then admitted to hospital for treatment. In 1895 the number of cases that come under this heading was 115, of which 78 were injected with antitoxin and 37 were left uninjected. If these 78 cases were deducted from the general mortality figure, the percentage mortality would be considerably under 20 per cent.; whilst, if those in which no antitoxin was given are also subtracted, the fall would be still more marked. On comparing these tables, it will be noted that the percentage of moribund cases not treated with antitoxin is in the case of the Fountain Hospital very low indeed—0·7 per cent.—whilst in the case of those treated with antitoxin the number is also comparatively low—only 8 cases in all, or 2·7 per cent. of those injected. In the South-Eastern and the North-Western Hospitals the number of moribund cases in which no antitoxin was given rises considerably, being 6·3 per cent. in the one case and 4·04 in the other; the Western and Eastern Hospitals occupy an intermediate position with 2·1 and 2·4 per cent. respectively. Dealing now with the injected cases, the South-Eastern and the North-Western Hospitals again have the highest figures—4·5 and 5·8 per cent. respectively; the Western, the Eastern, and the South-Western Hospitals again occupying an intermediate position with 3·5, 3·3, and 3·3 respectively. In 1896 there were 131 of these moribund cases, of which 90 were injected and 41 died before antitoxin was given. This year the Eastern Hospital has the smallest number of moribund uninjected cases—0·8 per cent.—whilst the Fountain Hospital has the lowest percentage of moribund injected cases; the other hospitals occupying the positions they held in the previous year, except that the North-Western Hospital has the highest percentage of both uninjected and injected moribund cases—3·9 and 5·3. Then comes the South-Eastern Hospital with 3·6 and 3·9, the other hospitals maintaining an intermediate position. It is very important that these moribund cases should be borne in mind when we come to determine the relation of the antitoxin treatment to the improvement of the diphtheria death-rate. Cases moribund on admission.

Paralyses occurring during the course of an Attack of Diphtheria.

Table XXXVI.—Showing Nature and Number (at different ages) of Paralyses found in cases in which Diphtheria bacilli were found and which were injected with Antitoxic Serum. The day on which paralysis made its appearance is recorded as from initial symptoms noted by the Ambulance Nurse. These figures deal with the cases that recovered.

1895.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Palate, Vagus, and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest day from onset of Disease on which Paralyses appeared.
Under 1	1	3	...	...	...	...	...	...	...	...	...	...	4	42 to 150
1 to 2	1	7	...	2	1	1	...	...	...	1	...	...	13	44 ,, 122
2 ,, 3	4	14	...	2	1	8	1	...	...	...	...	2	32	44 ,, 161
3 ,, 4	5	27	1	5	...	11	4	...	1	2	1	2	59	35 ,, 161
4 ,, 5	8	31	1	1	1	7	1	...	...	2	...	2	54	14 ,, 178
5 ,, 10	20	113	3	7	6	23	11	1	...	3	6	5	198	24 ,, 165
10 ,, 15	3	35	...	1	2	5	3	...	...	...	3	3	55	28 ,, 145
15 ,, 20	...	10	1	...	...	...	1	...	...	...	1	...	13	34 ,, 112
20 and upwards... ...	...	7	2	1	...	...	...	...	1	...	...	...	11	8 ,, 123
Total	42	247	8	19	11	55	21	1	2	8	11	14	439	

Table XXXVII. Showing Nature and Number (at different ages) of Paralyses found in cases in which Diphtheria bacilli were found and which were injected with Antitoxic Serum. The day on which paralysis made its appearance is recorded as from the initial symptoms noted by the Ambulance Nurse. These figures deal with the cases that died.

1895.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest day from onset of Disease on which Paralyses appeared.
Under 1	...	1	1	...	...	1	...	...	...	3	7 to 57
1 to 2	...	13	1	2	...	...	1	3	1	21	1 ,, 71
2 ,, 3	1	5	1	...	...	3	1	3	1	15	6 ,, 77
3 ,, 4	...	19	13	...	...	...	1	1	...	34	2 ,, 51
4 ,, 5	2	11	9	2	2	...	2	4	...	32	2 ,, 42
5 ,, 10	1	27	23	1	...	3	5	9	1	70	2 ,, 92
10 ,, 15	1	2	5	...	...	...	...	6	...	14	7 ,, 84
15 ,, 20	...	3	...	...	...	...	...	...	...	3	2 ,, 32
20 and upwards ...	...	...	1	...	...	...	...	...	...	1	8
Total	5	81	54	5	2	7	10	26	3	193	...

Paralyses occurring in course of diphtheria

Coming now to paralyses, the figures for 1894 dealing with cases in which antitoxin was given are incomplete, as the number of days in hospital is not given; but the number of cases is so small that the elimination of these figures would not materially alter the totals and averages of the whole of the cases. The cases in this year in which antitoxin was not given may also be practically left out of account. There were 4 cases of ocular paralysis, and 3 of ocular and palate paralysis, all of which recovered. In addition to these, there was 1 case of palate and vagus paralysis, which succumbed on the 99th day of the disease. It may be mentioned, however, that there were 3 of the above cases, in which no antitoxin was injected and in which paralysis occurred—1 ocular, 1 ocular and palate, and 1 general—all of which recovered. One case of ocular and palate paralysis died on the 106th day of the disease. In all these cases diphtheria bacilli were found. It will be noted that in 1895 there were amongst the injected cases (Tables XXXVI. and XXXVII.) 632 cases in which paralysis occurred, or 30·5 per cent. of the whole. Of these, 439 recovered, and 193, or 30·5 per cent., died. Ocular paralysis alone or in conjunction with other paralyses occurred in 132 of these cases; the palate was affected in 474 cases, the vagus in 102 cases. There was general paralysis in 77 cases, and what is called mixed paralysis in 17 cases, this mixed paralysis in all probability coming under several of the other headings, but not under "general." It is, of course, as would be anticipated, found that the greatest number of deaths, in proportion to the number of cases, occurs where the vagus is affected. Thus we have in this class 80 deaths and only 22 recoveries; but where the paralysis is "general" we have 17 deaths and 60 recoveries; where ocular paralysis occurs alone there are only 5 deaths, against 42 recoveries; and between these two extremes come the various combinations of palate and ocular paralysis, the more extensive the paralysis the higher being the mortality.

TABLE XXXVIII.—Showing Nature and Number (at different ages) of Paralyses found in cases in which Diphtheria bacilli were found and which were injected with Antitoxic Serum. The day on which paralysis made its appearance is recorded as from initial symptoms noted by the Ambulance Nurse. These figures deal with the cases that recovered.

1896.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General	Ocular and Palate.	Palate and General.	Palate, Vagus, and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest day from onset of Disease on which Paralyses appeared.
Under 1	2	3	...	...	...	2	...	...	...	...	...	...	...	7	27 to 102
1 to 2	6	11	1	...	...	1	...	...	...	...	...	...	5	24	13 ,, 176
2 ,, 3	11	21	1	3	...	13	2	...	...	1	1	...	18	71	14 ,, 189
3 ,, 4	21	35	...	3	...	23	1	1	...	...	...	...	13	97	41 ,, 186
4 ,, 5	16	51	2	2	1	21	2	...	...	1	...	...	22	118	32 ,, 152
5 ,, 10	39	200	13	6	2	57	7	1	2	...	8	1	52	388	21 ,, 322
10 ,, 15	7	51	2	1	...	12	1	...	...	...	2	...	11	87	16 ,, 183
15 ,, 20	...	7	...	...	...	2	...	...	...	...	...	...	1	10	32 ,, 129
20 and upwards	5	11	...	1	...	3	...	...	...	...	...	...	1	21	31 ,, 171
Total	107	390	19	16	3	134	13	2	2	2	11	1	123	823	...

Table XXXIX.—Showing Nature and Number (at different ages) of Paralyses found in cases in which Diphtheria bacilli were found and which were injected with Antitoxic Serum. The day on which paralysis made its appearance is recorded as from the initial symptoms noted by the Ambulance Nurse. These figures deal with the cases that died.

1896.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from Onset of Disease on which Paralyses appeared.
Under 1	...	4	4	...	...	...	...	...	1	...	9	2 to 28
1 to 2	1	9	1	1	1	...	...	2	1	...	16	2 ,, 88
2 ,, 3	1	15	7	...	4	1	...	3	...	...	31	2 ,, 67
3 ,, 4	...	21	12	3	2	...	...	2	...	2	42	1 ,, 75
4 ,, 5	1	20	14	...	2	4	...	5	...	2	48	2 ,, 44
5 ,, 10	1	52	24	...	1	3	5	10	1	5	102	2 ,, 101
10 ,, 15	...	10	3	1	1	...	...	4	1	...	20	1 ,, 48
15 ,, 20	1	1	...	...	...	...	...	1	1	..	4	5 ,, 12
20 and upwards	...	...	1	...	...	...	...	...	...	.	1	2
Total	5	132	66	5	11	8	5	27	5	9	273	...

In 1896 (Tables XXXVIII. and XXXIX.) the number of paralyses is still higher—1,096—but the death-rate—24·9—is considerably lower, especially where antitoxin has been used. The proportion of what are called mixed paralyses is much higher, and it is evident that a more careful record has been kept of the ocular paralyses, in which now the death-rate is exceedingly low, and in all probability a much larger proportion of cases of ciliary paralysis have been recorded in 1896 because a more careful search has been made for this condition. The other figures, arranged in the same way as in 1895, give practically the same results, the vagus paralysis being, of course, by far the most fatal form.

TABLE XL.—Showing Nature and Number (at different ages) of Paralyses found in cases in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected. The day on which paralysis made its appearance is recorded as from the initial symptoms noted by the Ambulance Nurse. These figures deal with the cases that recovered.

1895.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Palate and Vagus.	Mixed.	Totals.	Lowest and Highest day from onset of Disease on which Paralyses appeared.
Under 1	1	1	...	...	...	...	...	...	...	2	58 and 71
1 to 2	...	1	...	...	...	1	...	...	...	2	93 ,, 161
2 ,, 3	...	5	1	...	...	...	...	...	...	6	24 to 121
3 ,, 4	...	8	...	...	...	1	...	...	...	9	33 ,, 205
4 ,, 5	4	11	...	...	...	1	3	...	1	20	27 ,, 160
5 ,, 10	7	57	2	3	1	9	6	1	6	92	28 ,, 224
10 ,, 15	3	28	1	3	...	1	1	4	4	45	34 ,, 133
15 ,, 20	2	7	1	...	...	...	...	1	1	12	79 ,, 122
20 and upwards ...	1	6	1	2	...	...	1	1	...	12	49 ,, 97
Total	18	124	6	8	1	13	11	7	12	200	...

TABLE XLI.—Showing Nature and Number (at different ages) of Paralyses found in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected. The day on which paralysis made its appearance is recorded as from the initial symptoms noted by the Ambulance Nurse. These figures deal with the cases that died.

1895.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Palate and Vagus.	Total.	Lowest and Highest day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...
1 to 2	...	1	2	...	...	1	...	4	2 to 34
2 ,, 3	...	4	2	1	...	1	...	8	2 ,, 44
3 ,, 4	1	8	1	...	1	...	...	11	5 ,, 61
4 ,, 5	...	6	1	...	1	...	...	8	2 ,, 42
5 ,, 10	...	14	7	3	2	...	1	27	1 ,, 84
10 ,, 15	...	1	1	1	...	...	2	5	10 ,, 53
15 ,, 20	...	...	...	...	...	...	...	...	...
20 and upwards ...	...	1	...	...	...	...	...	1	22
Total	1	35	14	5	4	2	3	64	...

In the same class of case in which antitoxin has not been injected (Tables XL. and XLI.) we have evidence that, although the cases were not looked upon as being of a "severe" type, there had been enough toxin absorbed to set up very marked changes in the nervous and perhaps also in the muscular system. Thus there were 264 cases of paralysis, of which 200 recovered and 64 died—a mortality of 32 per cent., or a higher mortality than amongst the cases in which antitoxin was used. Of course some of these cases may have been admitted in a moribund condition, but the majority of them must be looked upon as having developed paralysis as the result of a comparatively mild attack of the disease; it is evident also that when once paralysis supervenes it may be quite as fatal in its effects whether antitoxin has been given afterwards or not: neither the antitoxin nor any other method of treatment can make good the degenerative changes that occur in nerve and muscle, as the result of which these paralyses manifest themselves, though the antitoxin, if given in sufficient quantity, undoubtedly puts a stop to the advance of the degenerative changes due to the action of the toxin.

In 1896 we have to deal (Tables XLII. and XLIII.) with a much less serious series than in 1895—the mortality has now fallen to 18·4—266 cases, with 49 deaths. In all these sets of figures it will be noted that paralysis with recovery occurs much more frequently at the later periods of life, whilst paralysis followed by death occurs in a much larger proportion of cases in the earlier years of life, and, as might be anticipated, the highest mortality in the series occurs between 2 and 10 years of age.

TABLE XLII.—Showing Nature and Number (at different ages) of Paralyses found in cases in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected. The day on which paralysis made its appearance is recorded as from the initial symptoms noted by the Ambulance Nurse. These figures deal with the cases that recovered.

1896.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...
1 to 2	1	1	...	...	1	...	...	...	...	3	39 to 154
2 „ 3	5	6	...	...	...	...	1	...	2	14	38 „ 179
3 „ 4	3	4	...	...	2	...	...	...	1	10	54 „ 140
4 „ 5	3	11	3	1	3	...	...	...	1	22	15 „ 158
5 „ 10	18	51	5	1	10	...	1	2	21	109	24 „ 203
10 „ 15	6	14	2	2	...	...	1	1	8	34	24 „ 114
15 „ 20	1	5	...	1	1	...	...	...	1	9	30 „ 67
20 and upwards ...	...	12	1	...	1	1	...	...	1	16	26 „ 139
Total	37	104	11	5	18	1	3	3	35	217	...

TABLE XLIII.—Showing Nature and Number (at different ages) of Paralyses found in cases in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected. The day on which paralysis made its appearance is recorded as from the initial symptoms noted by the Ambulance Nurse. These figures deal with the cases that died.

1896

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest day from onset of Disease on which Paralyses appeared.
Under 1	...	2	...	...	...	...	...	2	4 and 64
1 to 2	1	...	1	...	3	...	...	5	1 to 58
2 „ 3	...	4	2	...	...	...	...	6	2 „ 21
3 „ 4	...	6	1	...	...	...	...	7	6 „ 45
4 „ 5	...	5	1	...	...	3	...	9	3 „ 34
5 „ 10	1	4	3	1	1	7	1	18	2 „ 59
10 „ 15	...	...	1	...	...	1	...	2	6 and 11
15 „ 20	...	...	...	...	...	...	...	...	...
20 and upwards ...	...	...	...	...	...	...	...	...	...
Total	2	21	9	1	4	11	1	49	...

TABLE XLIV.—Showing Relapse cases at different ages in which Diphtheria bacilli were found and which were re-injected with Antitoxic Serum after a lapse of a period of at least fourteen days. These cases may therefore be looked upon as having undergone a relapse.

	1894.			1895.			1896.		
Ages.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.
Under 1	...	...	0·0	...	...	0·0	1	...	0·0
1 to 2	...	...	0·0	4	2	50·0	3	2	66·6
2 „ 3	1	...	0·0	2	...	0·0	7	3	42·8
3 „ 4	...	...	0·0	2	1	50·0	6	...	0·0
4 „ 5	...	...	0·0	2	...	0·0	9	...	0·0
5 „ 10	1	...	0·0	3	...	0·0	15	1	6·6
10 „ 15	...	...	0·0	...	...	0·0	...	...	0·0
15 „ 20	...	...	0·0	...	...	0·0	2	...	0·0
20 and upwards...	...	...	0·0	...	...	0·0	...	...	0·0
Total	2	...	0·0	13	3	23·07	43	6	13·9

Cases of relapse.

One point that comes out in connection with a study of the cases of diphtheria treated with antitoxin is that in a certain proportion of them there appears to be a distinct recrudescence of the disease, which is indicated by the fact that it was necessary to inject a fresh dose of antitoxin at a later stage (Table XLIV.). It has been deemed advisable to take an interval of 14 days as that which affords the best evidence of the occurrence of this recrudescence. It would seem that in such cases the amount of antitoxin injected has only been sufficient to neutralise the quantity of toxin in the body at the time of injection, the patient being still left in a comparatively unprotected condition, with the result that he has contracted what might practically be called a second attack of the disease. Of course these relapses occur even in cases in which antitoxin has not been given, but there are no definite data on which to base any comparison. One fact is most strongly brought out in this series of figures, *i.e.*, the importance of administering a sufficient amount of antitoxin not only to neutralise the poison that is actually present at the time of the injection, but to leave a sufficient amount in the body of the patient to neutralise any of the poison that may be formed for some little time afterwards, in order that the tissues may be left free to carry on the process of regeneration by means of which the membranous patches are thrown off and the wounded surface healed. In 1894, when the amount of antitoxin given was comparatively low, we find that there were 8·3 per cent. of such relapses; this, however, applies only to a small number of cases. In 1895 there was a percentage of 0·6 of similar cases; but from a careful examination of the tables it would appear that injections were not given, in cases in which there was actual relapse, in nearly the same proportion of cases as in 1896, so that this figure cannot be taken to represent accurately the number of relapses. In 1896 the figure had risen to 1·2 per cent.—a figure which may be taken as the basis for future comparisons. The 1895 figures are of comparatively little value; the 1896 figures will, however, be useful for future reference. Cases of relapse.

TABLE XLV.—Showing Hæmorrhagic cases of Diphtheria, with percentage Mortality (at different ages), in which Diphtheria bacilli were found and in which Antitoxic Serum was injected. Hæmorrhagic diphtheria.

1895.				1896.			
Ages.	Cases.	Deaths.	Mortality per Cent.	Ages.	Cases.	Deaths.	Mortality per Cent.
Under 1	...	...	0·0	Under 1	...	...	0·0
1 to 2	1	1	100·0	1 to 2	2	2	100·0
2 ,, 3	3	2	66·6	2 ,, 3	9	9	100·0
3 ,, 4	6	5	83·3	3 ,, 4	11	11	100·0
4 ,, 5	13	13	100·0	4 ,, 5	16	16	100·0
5 ,, 10	35	35	100·0	5 ,, 10	50	49	98·0
10 ,, 15	3	3	100·0	10 ,, 15	7	7	100·0
15 ,, 20	...	...	0·0	15 ,, 20	...	...	0·0
20 and upwards	...	...	0·0	20 and upwards... ...	...	...	0·0
Total	61	59	96·7	Total	95	94	98·9

In 1895 there were 61 hæmorrhagic cases of diphtheria injected with antitoxin (Table XLV.), but all of them but two died, giving a death-rate of 96·7 per cent. Of the 13 hæmorrhagic cases not injected (Table XLVI.) every one died. In 1896 only one case out of 95 recovered of those injected (Table XLV.), whilst of 12 non-injected cases (Table XLVI.) every one died. It would appear that in this type of case the diphtheria bacilli are not confined to the membrane in the throat, but that they have made their way, in many cases at any rate, into the circulation and organs of the body. Of course it may be in those rare cases that recovered that we had a large dose of toxin rapidly absorbed without the diphtheria bacilli, and that when this poison was neutralised by the injection of large doses of antitoxin the tissues were not so far damaged that recovery was out of the question. Beyond doubt the appearance of hæmorrhages indicates that the tissues are most profoundly damaged by a large quantity of toxin.

TABLE XLVI.—Showing Hæmorrhagic cases of Diphtheria, with percentage Mortality (at different ages), in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected.

1895.				1896.			
Ages.	Cases.	Deaths.	Mortality per Cent.	Ages.	Cases.	Deaths.	Mortality per Cent.
Under 1	...	...	0·0	Under 1	...	...	0·0
1 to 2	...	...	0·0	1 to 2	1	1	100·0
2 ,, 3	2	2	100·0	2 ,, 3	3	3	100·0
3 ,, 4	1	1	100·0	3 ,, 4	1	1	100·0
4 ,, 5	...	...	0·0	4 ,, 5	2	2	100·0
5 ,, 10	8	8	100·0	5 ,, 10	4	4	100·0
10 ,, 15	2	2	100·0	10 ,, 15	...	...	0·0
15 ,, 20	...	...	0·0	15 ,, 20	1	1	100·0
20 and upwards	...	...	0·0	20 and upwards... ...	...	...	0·0
Total	13	13	100·0	Total	12	12	100·0

The Nature and Incidence of Rashes.

Of the 1894 cases sent up for bacteriological examination 24 were injected with antitoxin; of these 13 developed rashes—3 urticarial, 4 erythematous, 2 "antitoxin" rash, 1 blotchy rash, 2 with rash—no further description being given—1 scarlatinal rash. That these were not all due to the antitoxin, however, is evident from the fact that two of the 21 cases not injected also developed a rash, described as "bright" in one case and "punctiform scarlet fever" in the other. It is scarcely necessary to give the number of days at which the rash appeared in these cases.

Many rashes not caused by antitoxin.

In 1895 (Table XLVII.) the number of rashes that made their appearance in the injected cases was 1,021. The kind of rash met with in the major proportion of these cases was undoubtedly urticarial—a rash which, as will be seen from the figures, makes its appearance at a comparatively early stage after the injection has been made. There were 528 cases in which this rash occurred, usually making its appearance at about the 14th day. The date of appearance of these rashes is taken from the day following the injection of the antitoxin; but, as will be seen from the next Table (Table XLVIII.), a certain proportion of these rashes would undoubtedly have made their appearance had there been no antitoxin injected, for we find that here we have 171 cases in which a rash made its appearance although no antitoxin had been administered. It should be noted, however, that the proportion of urticarial rashes is comparatively small—only 35, or 1·9 per cent.—whilst the proportion of erythematous rashes to urticarial rashes is slightly higher in the non-antitoxin cases, but considerably lower in the antitoxin cases. Taking into account that the cases treated with antitoxin were probably in most cases comparatively severe, and, therefore, that the diphtheria rash would in all probability have been present in a greater proportion of cases, the number of rashes put down to the action of the antitoxic serum alone should be still further reduced.

In 1896 (Tables XLVII. and XLVIII.) 1,551 cases are recorded in which a rash of some kind or other made its appearance during the course of the attack of diphtheria. It is evident that either the character or the nomenclature of the rashes must have undergone considerable modification in this year; the proportion of urticarial rashes has fallen very considerably, as we have now only 425 cases, against 524, of erythematous rash. Both in 1895 and 1896 we have the heading "Antitoxin Rash," which in the former year accounts for 32 of the rashes, whilst in 1896 this number has risen to 121. In 1896, too, the proportion of scarlet fever rashes is comparatively high, as this year there were 72 cases, against 12 in 1895, whilst of those not injected there were 74 scarlet fever rashes in 1896, against 27 in 1895. Of the non-injected cases in 1896 in which diphtheria bacilli were found, 320 suffered from some form of rash. Here again the number of erythematous and punctiform erythematous rashes was very high, these forms of rash accounting for 82 and 96 cases respectively, against 37 and 22 in 1895, from which it will be gathered that rashes were much more carefully looked for and noted in 1896 than in 1895. Scarlet fever accounts for 74 of the rashes, and urticaria for only 20; still, this table also indicates that even without antitoxic serum a large number of diphtheria cases are found to develop rashes, these being especially, however, of the erythematous and scarlatinal types; from this we should gather that the urticarial rash is that which should be more especially associated with the use of antitoxic serum, although the erythematous type may also, in a certain proportion of cases, be due to this rash-producing action of the serum. From the fact that so many of the rashes occur at a comparatively late stage of the disease, and that such a large proportion of the cases recovered, they cannot be looked upon as being in any way dangerous, although the secondary rise of temperature and the irritation of the skin, which usually accompany their presence, may undoubtedly retard the convalescence of nervous and irritable patients, and any means by which this irritating element can be eliminated from the serum must lead to a distinct advance in the popularity of this method of treatment.

Antitoxin rash urticarial in type.

Rashes not dangerous but undesirable.

Bronchitis and Pneumonia.

In 1894 there were amongst the cases in which diphtheria bacilli were found one case of broncho-pneumonia and one of bronchitis, both of which recovered. These were not injected. Amongst the injected cases in 1895 (Table XLIX.) we find that there occurred 5 cases of lobar pneumonia, of which 2 died; 14 of "pneumonia" (form not stated), with 9 deaths; 5 of septic pneumonia, 4 deaths; 1 of apical pneumonia, which recovered; 70 of broncho-pneumonia, of which 54 died; and 22 of bronchitis, with 12 deaths. Amongst the non-injected cases (Table L.) we have also a number of these complications. For instance, there are 8 cases of lobar pneumonia, with 4 deaths; 8 cases of "pneumonia" (form not stated), and 6 deaths; 1 case of septic pneumonia, which proved fatal; 29 cases of broncho-pneumonia, with 20 deaths; and 20 cases of bronchitis, of which 5 died. Here, then, is a difference as regards the incidence of pneumonia and bronchitis in diphtheritic cases—5·65 per cent. in the whole of the injected cases, against 3·76 on the whole of the cases not treated with antitoxic serum. It must be remembered, however, that in this year only those cases were injected which were comparatively severe to begin with; and, as the "poisoned" condition of the blood may play a most important part in determining pneumonias and bronchitis, we should expect a larger proportion of cases to be affected with this complication in the severe injected cases than in the comparatively mild non-injected cases. This comes out even more distinctly in 1896, when, although the cases of bronchitis and broncho-pneumonia especially were still numerous amongst the cases injected, the proportion of such complications is lower than in 1895—4·34, against 5·65, of the injected cases. The percentage mortality amongst these cases has, however, fallen from 69·2 to 44·1. Amongst the uninjected cases there has been a fall from 3·76

Table XLVII.—Showing Nature and Number of Rashes found in cases of Diphtheria (at different ages) in which Diphtheria bacilli were found and which were injected with Antitoxic Serum. The third column of figures refers to the earliest and the fourth column to the latest day on which the rash appeared after the injection of antitoxic serum, not counting the day of injection.

Hospitals	Urticaria.				Erythema.				Papular.				Macular Erythema.				Punctiform Erythema.				Blotchy Rash.				Antitoxin Rash.				Rash.				Scarlet Fever Rash.				Septic Rash.				Total.	
	Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.			Cases.	Percentage on total injected cases.
1895.																																										
Fountain	75	26·1	2	25	19	6·6	1	32	8	2·7	3	52	3	1·04	3	28	17	5·9	3	26	8	2·7	6	16	13	4·5	4	20	17	5·9	2	49	1	0·3	13	...	1	0·3	5	...	162	56·4
Western	98	23·7	1	28	87	21·1	2	36	12	2·9	6	24	16	3·8	4	22	12	2·9	2	21	...	...	...	...	...	...	...	...	13	3·1	4	22	...	...	...	...	...	...	...	...	238	57·7
Eastern	44	14·5	2	20	58	19·2	2	24	5	1·6	3	15	4	1·3	1	9	6	1·9	4	30	3	0·9	4	9	17	5·6	3	16	24	7·9	5	17	3	0·9	4	17	...	...	...	...	164	54·3
South-Eastern ...	85	20·2	1	22	73	17·3	1	52	1	0·2	10	...	4	0·9	5	15	2	0·4	9	80	1	0·2	71	...	1	0·2	8	...	11	2·6	2	56	2	0·4	2	...	...	...	...	...	180	42·8
South-Western ...	177	58·4	4	39	9	2·9	2	34	...	...	...	...	...	...	...	...	1	0·3	23	...	1	0·3	10	...	...	...	...	...	2	0·6	17	20	2	0·6	6	14	...	...	...	...	192	63·3
North-Western ...	31	11·2	3	15	12	4·3	3	20	2	0·7	9	10	...	...	...	...	1	0·3	4	...	...	...	...	...	1	0·3	11	...	7	2·5	4	43	4	1·4	5	16	1	0·3	2	...	59	21·4
Northern	18	26·08	7	16	2	2·8	5	12	1	1·4	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	7·2	8	10	...	...	...	...	...	...	...	...	26	37·6
Total	528	25·5	...	...	260	12·5	...	...	29	1·4	...	...	27	1·3	...	...	39	1·8	...	..	13	0·6	...	...	32	1·5	...	...	79	3·8	...	...	12	0·5	...	...	2	0·09	...	...	1021	49·3
1896.																																										
Fountain	48	7·5	2	38	58	9·09	1	28	20	3·1	2	25	9	1·4	6	19	27	4·2	3	39	14	2·1	3	29	44	6·8	3	29	53	8·3	2	46	22	3·4	2	39	3	0·4	2	12	298	46·7
Western	136	22·1	1	62	105	17·1	1	56	18	2·9	9	23	35	5·7	1	51	20	3·2	2	50	1	0·1	2	...	2	0·3	5	22	14	2·2	2	24	11	1·7	2	58	...	...	...	...	342	55·7
Eastern	20	4·07	1	15	130	26·4	1	46	9	1·8	1	31	2	0·4	10	...	21	4·2	2	63	...	...	...	...	38	7·7	2	16	11	2·2	5	19	3	0·6	9	25	...	...	...	...	234	47·6
South-Eastern ...	69	13·5	2	50	96	18·8	1	105	3	0·5	3	25	6	1·1	3	24	18	3·5	4	52	...	...	...	...	10	1·9	5	54	22	4·3	1	80	5	0·9	6	50	...	...	...	...	229	44·9
South-Western ...	71	22·8	1	27	31	9·9	2	60	...	...	...	...	...	...	...	...	8	2·5	5	25	...	...	...	...	2	0·6	13	16	10	3·2	1	18	5	1·6	4	33	...	...	...	...	127	40·8
North-Western ...	25	7·06	1	64	40	11·2	2	34	...	...	...	...	2	0·5	31	33	12	3·3	2	59	...	...	...	...	6	1·6	9	17	7	1·9	5	34	22	6·2	3	54	...	...	...	...	114	32·2
North-Eastern ...	2	11·1	7	9	1	5·5	35	...	...	...	...	...	...	...	...	...	1	5·5	19	...	3	16·6	9	16	1	5·5	10	...	5	27·7	all	OA	1	5·5	OA	...	...	...	...	...	14	77·7
Brook	12	7·01	2	105	57	33·3	1	18	2	1·1	7	13	...	...	...	...	2	1·1	10	15	...	...	...	...	2	1·1	10	14	5	2·9	2	20	1	0·5	50	...	...	...	...	...	81	47·3
Northern	31	17·3	7	19	2	1·1	5	7	7	3·9	6	10	...	...	...	...	...	...	...	...	...	...	...	...	16	8·9	9	16	36	20·1	2	30	2	1·1	2	3	...	...	...	...	94	52·5
Gore Farm	11	19·2	3	14	4	7·01	11	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	5·2	10	...	...	...	...	...	...	...	...	...	18	31·5
Total	425	12·7	...	...	524	15·6	...	...	59	1·7	...	...	54	1·6	..	...	109	3·2	...	...	18	0·5	...	...	121	3·6	...	...	166	4·9	...	...	72	2·1	...	...	3	0·08		...	1551	46·1

Note.—OA = On admission to Hospital.

TABLE XLVIII.—Showing Nature and Number of Rashes found in cases of Diphtheria (at different ages) in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected. The third column of figures refers to the earliest and the fourth column to the latest day on which the rash appeared after the onset of the disease.

Hospitals.	Urticaria.				Erythema.				Papular.			
	Cases.	Percentage on total cases not injected.			Cases.	Percentage on total cases not injected.			Cases.	Percentage on total cases not injected.		
1895.												
Fountain	20	5·0	9	20	8	2·0	8	65	3	0·7	5	18
Western	3	1·5	11	17	2	1·05	7	9	...	...	...	...
Eastern	3	0·7	4	15	24	5·9	2	34	8	1·9	2	54
South-Eastern	2	2·1	12	27	2	2·1	9	17	...	...	...	...
South-Western	4	2·8	10	...	...	...	...	...	...	...	...	...
North-Western	1	0·2	4	...	1	0·2	9	...	...	...	...	...
North-Eastern	1	1·7	78	...	...	...	...	...	...	...	...	...
Northern	1	0·8	15	...	...	...	...	...	...	...	...	...
Total... ...	35	1·9	...	...	37	2·1	...	...	11	0·6	...	...
1896.												
Fountain	5	1·6	CA	15	9	2·9	OA	34	2	0·6	6	35
Western	1	0·3	14	...	15	5·5	1	31	3	1·1	5	10
Eastern	2	0·8	8	10	24	10·2	OA	35	4	1·7	OA	40
South-Eastern	7	3·6	10	57	10	5·2	6	26	1	0·5	6	...
South-Western	2	1·1	6	12	11	6·4	5	18	1	0·5	6	...
North-Western	1	0·2	14	...	3	0·7	8	56	...	...	...	...
North-Eastern	...	...	...	...	...	...	...	...	...	...	...	...
Brook	...	...	...	...	10	18·8	6	14	...	...	...	...
Northern	2	2·7	35	55	...	...	...	...	...	...	...	...
Gore Farm ...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	20	1·1	...	...	82	4·7	...	...	11	0·6	...	...

Hospitals.	Macular Erythema.				Punctiform Erythema.				Blotchy Rash.			
	Cases.	Percentage on total cases not injected.			Cases.	Percentage on total cases not injected.			Cases.	Percentage on total cases not injected.		
1895.												
Fountain	1	0·2	45	...	1	0·2	15	...	1	0·2	19	...
Western	...	...	...	...	1	0·5	22	...	...	...	...	...
Eastern	...	...	...	...	16	3·9	2	30	...	...	...	...
South-Eastern	...	...	...	...	1	1·06	99	...	...	...	...	...
South-Western	...	...	...	...	...	...	...	...	...	...	...	...
North-Western	...	...	...	...	2	0·5	6	38	1	0·2	55	...
North-Eastern	...	...	...	...	...	...	...	...	...	...	...	...
Northern	...	...	...	...	1	0·8	OA	...	...	...	...	...
Total... ...	1	0·05	...	...	22	1·2	...	...	2	0·1	...	...
1896.												
Fountain	...	...	...	...	35	11·4	OA	63	...	...	...	...
Western	2	0·7	10	31	8	2·9	9	10	...	...	...	...
Eastern	...	...	...	...	16	6·8	OA	13	...	...	...	...
South-Eastern	...	...	...	...	20	10·4	OA	125	...	...	...	...
South-Western	...	...	...	...	2	1·1	4	36	...	...	...	...
North-Western	...	...	...	...	11	2·9	3	23	...	...	...	...
North-Eastern	...	...	...	...	1	3·4	OA	...	...	...	...	...
Brook	...	...	...	...	3	5·6	10	...	...	...	...	...
Northern	...	...	...	...	...	...	...	...	...	...	...	...
Gore Farm ...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	2	0·1	...	...	96	5·5	...	...	...	...	...	...

Hospitals.	Rash.				Scarlet Fever Rash.				Septic Rash.				Total.	
	Cases.	Percentage on total cases not injected.			Cases.	Percentage on total cases not injected.			Cases.	Percentage on total cases not injected.			Cases.	Percentage on total cases not injected.
1895.														
Fountain	6	1·5	2	38	7	1·7	6	31	1	0·2	8	...	48	12·0
Western	1	0·5	36	...	1	0·5	41	...	...	...	...	...	8	4·2
Eastern	11	2·7	OA	10	8	1·9	OA	9	...	...	...	...	70	17·2
South-Eastern	2	2·1	2	24	...	...	...	...	...	...	...	...	7	7·4
South-Western	...	...	...	...	...	...	...	...	...	...	...	...	4	2·8
North-Western	7	2·02	6	40	6	1·7	10	45	1	0·2	5	...	19	5·4
North-Eastern	7	12·06	1	19	...	...	...	...	...	...	...	...	8	13·7
Northern	...	...	...	...	5	4·09	7	40	...	...	...	...	7	5·7
Total... ...	34	1·9	...	...	27	1·5	...	...	2	0·1	...	...	171	9·7
1896.														
Fountain	11	3·5	OA	8	16	5·2	OA	104	...	...	...	...	78	25·4
Western	2	0·7	10	...	3	1·1	10	...	...	...	...	...	34	12·5
Eastern	3	1·2	10	85	14	5·9	OA	37	...	...	...	...	63	26·9
South-Eastern	1	0·5	7	...	4	2·09	OA	11	...	...	...	...	43	22·5
South-Western	3	1·7	2	6	4	2·3	2	22	...	...	...	...	23	13·5
North-Western	7	1·8	3	23	21	5·5	4	49	1	0·2	8	...	44	11·6
North-Eastern	5	17·2	OA	2	9	31·03	OA	...	...	...	...	...	15	51·7
Brook	1	1·8	...	55	1	1·8	3	...	...	...	...	...	15	28·3
Northern	1	1·3	...	25	1	1·3	10	...	...	...	...	...	4	5·5
Gore Farm ...	...	...	..	...	1	4·1	10	...	...	...	...	...	1	4·1
Total ...	34	1·9	..	...	74	4·2	...	...	1	0·05	...	...	320	18·5

NOTE.—OA = On admission to Hospital.

to 2·2, whilst the percentage mortality has also fallen from 54·5 to 31·5. Bearing in mind the fact that in 1896 the proportion of mild cases amongst those not treated with antitoxin was comparatively large, these figures are readily accounted for, especially when it is remembered that pneumonia and bronchitis occurred in a greater number of cases amongst the more severe cases where antitoxin was given; even here, however, the antitoxin appeared to diminish the liability of the lungs to undergo inflammatory changes in comparatively severe attacks of diphtheria.

Table XLIX.—Showing Pneumonic complications, with percentage Mortality (at different ages), in cases of Diphtheria in which Diphtheria bacilli were found and in which Antitoxic Serum was injected.

Ages.	1895.														1896.											
	Lobar Pneumonia.		Pneumonia (form not stated).		Septic Pneumonia.		Apical Pneumonia.		Broncho-Pneumonia.		Bronchitis.		Total.		Lobar Pneumonia.		Pneumonia (form not stated).		Septic Pneumonia.		Broncho-Pneumonia.		Bronchitis.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 ...	...	...	1	1	...	...	1	...	4	4	1	1	7	6	...	...	...	...	...	...	4	2	2	...	6	2
1 to 2 ...	1	1	4	3	1	...	...	...	26	21	4	4	36	29	3	3	...	...	...	...	23	12	13	7	39	22
2 ,, 3 ...	...	...	2	2	...	...	...	...	12	8	5	1	19	11	...	...	1	...	...	...	24	12	9	4	34	16
3 ,, 4 ...	1	...	2	...	...	...	...	...	8	6	5	3	16	9	2	1	2	...	1	1	14	6	14	4	33	12
4 ,, 5 ...	2	1	2	2	...	...	...	...	9	7	2	2	15	12	...	...	2	1	...	...	5	4	5	1	12	6
5 ,, 10 ...	1	...	3	1	3	3	...	...	9	7	3	1	19	12	2	1	3	...	1	1	5	2	6	1	17	5
10 ,, 15 ...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	...	...	...	...	...	...	1	1	3	...	4	1
15 ,, 20 ...	...	...	...	...	1	1	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
20 & upwards	...	...	...	...	...	...	...	...	1	...	2	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	5	2	14	9	5	4	1	...	70	54	22	12	117	81	7	5	8	1	2	2	76	39	52	17	145	64
Mortality per cent.	...	40·0	...	64·2	...	80·0	...	0·0	...	77·1	...	54·5	...	69·2	...	71·4	...	12·5	...	100·0	...	51·3	...	32·6	...	44·1

Table L.—Showing Pneumonic complications, with percentage Mortality (at different ages), in cases of Diphtheria in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected.

Ages.	1895.												1896.									
	Lobar Pneumonia.		Pneumonia (form not stated).		Septic Pneumonia.		Broncho-Pneumonia.		Bronchitis.		Total.		Lobar Pneumonia.		Pneumonia (form not stated).		Broncho-Pneumonia.		Bronchitis.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 ...	...	...	...	...	...	...	2	1	...	...	2	1	...	...	1	1	...	...	...	...	1	1
1 to 2 ..	3	2	2	1	...	...	7	6	3	2	15	11	2	1	...	...	...	...	2	2	4	3
2 ,, 3 ...	1	...	1	1	...	...	8	7	4	2	14	10	...	...	...	...	6	3	...	...	6	3
3 ,, 4 ...	...	...	1	1	...	...	7	4	3	...	11	5	...	...	...	...	6	3	1	1	7	4
4 ,, 5 ...	...	...	2	2	...	...	2	...	3	...	7	2	...	...	...	...	3	1	2	...	5	1
5 ,, 10 ...	4	2	1	1	1	1	2	1	3	...	11	5	1	...	4	...	3	...	4	...	12	...
10 ,, 15 ...	...	...	...	...	...	...	1	1	2	...	3	1	...	...	...	...	...	...	...	...	...	...
15 ,, 20 ...	...	...	1	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	1	...	1	...
20 and upwards	...	...	...	...	...	...	...	...	1	1	1	1	...	...	...	...	...	...	2	...	2	...
Total ...	8	4	8	6	1	1	29	20	20	5	66	36	3	1	5	1	18	7	12	3	38	12
Mortality per cent.	...	50·0	...	75·0	...	100·0	...	68·9	...	25·0	...	54·5	...	33·3	...	20·0	...	38·8	...	25·0	...	31·5

Tonsillitis Complications.

It will be noted, on referring to Table LI., that in 1895 there were 9 cases which are described as tonsillitis, and in 1896, 6, though they were really found to be cases of diphtheria, as not only were diphtheria bacilli found in the throat, but the clinical symptoms were so characteristic that it was deemed advisable to administer antitoxin. Amongst these cases there

Tonsillitis.

were no deaths. In the same periods (Table LII.) there were also a number of cases which, although diphtheria bacilli were found, were of such a comparatively mild type that it was not thought necessary to inject antitoxin. Of such cases there were 31 in 1895, and 48 in 1896. Amongst these cases there was only one death (in 1895), this fact affording additional evidence of the mildness of the type of disease in such cases. In Table LIII. are collected records of those cases in which, although no diphtheria bacilli were found, it was deemed expedient to inject antitoxic serum on account of the clinical features presented. In 1895 such cases were much more numerous than in 1896—103 against 39. Here again the death-rate was very low. Such cases must accordingly be looked upon either as suffering from an exceedingly mild type of diphtheria, or as being cases of true tonsillitis. From the three tables, accepting the former alternative, we find that, amongst cases diagnosed as suffering from tonsillitis, 143 in 1895, and 93 in 1896, were in all probability cases of diphtheria—of comparatively mild type, no doubt, as the percentage mortality amongst these was in 1895 only 3·5, and in 1896 1·07, but still they were cases some of which might, under other conditions, have developed more severe symptoms; whilst even those which might have remained mild could, under certain conditions, have been sent out to form foci from which the disease might readily be spread.

Table LI.—Table showing Number of cases (at different ages) of "Tonsillitis" in which Diphtheria bacilli were found and in which Antitoxic Serum was injected.

1895.

Ages.	Fountain Hospital.	Western Hospital.	Eastern Hospital.	South-Eastern Hospital.	South-Western Hospital.	North-Western Hospital.	Total.
Under 1 ...	...	...	...	...	...	...	...
1 to 2 ...	1	...	...	...	...	...	1
2 ,, 3 ...	...	...	...	...	...	...	...
3 ,, 4 ...	...	...	1	...	...	...	1
4 ,, 5 ...	...	...	...	...	...	...	...
5 ,, 10 ...	...	...	2	2	1	1	6
10 ,, 15 ...	...	...	...	...	...	...	...
15 ,, 20 ...	...	...	...	...	...	...	...
20 & upwards	...	1	...	...	...	...	1
Total	1	1	3	2	1	1	9

1896.

Ages.	Fountain Hospital.	Western Hospital.	South-Western Hospital.	North-Western Hospital.	Brook Hospital.	Total.
Under 1 ...	...	...	...	...	...	...
1 to 2 ...	...	...	...	...	...	...
2 ,, 3 ...	...	...	...	...	...	...
3 ,, 4 ...	...	...	...	...	...	...
4 ,, 5 ...	...	...	...	...	...	...
5 ,, 10 ...	...	1	1	2	1	5
10 ,, 15 ...	...	...	...	...	...	...
15 ,, 20 ...	1	...	...	...	...	1
20 & upwards	...	...	...	...	...	...
Total	1	1	1	2	1	6

Table LII.—Showing Number of cases (at different ages) of "Tonsillitis" in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected.

1895.

Ages.	Fountain Hospital.	Western Hospital.	Eastern. Hospital.	South-Eastern Hospital.	South-Western Hospital.	North-Western Hospital.	North-Eastern Hospital.	Total.
Under 1 ...	...	...	...	...	...	...	...	...
1 to 2 ...	...	...	...	...	...	...	...	...
2 ,, 3 ...	...	...	...	...	...	...	1[1]	1
3 ,, 4 ...	...	...	...	...	...	...	...	...
4 ,, 5 ...	1	...	1	...	...	...	...	2
5 ,, 10 ...	4	...	2	1	1	2	...	10
10 ,, 15 ...	3	2	5	...	...	1	...	11
15 ,, 20 ...	1	...	3	...	...	...	...	4
20 & upwards	1	...	2	...	...	...	...	3
Total ...	10	2	13	1	1	3	1	31

1896.

Ages.	Fountain Hospital.	Western Hospital.	Eastern Hospital.	South-Eastern Hospital.	South-Western Hospital.	North-Western Hospital.	Brook Hospital.	Total.
Under 1 ...	...	...	...	...	...	...	...	...
1 to 2 ...	1	...	1	...	...	...	...	2
2 ,, 3 ...	...	1	...	1	...	...	...	2
3 ,, 4 ...	...	...	1	...	...	...	...	1
4 ,, 5 ...	...	1	...	...	...	...	1	2
5 ,, 10 ...	3	...	5	...	1	4	1	14
10 ,, 15 ...	1	1	1	1	...	3	2	9
15 ,, 20 ...	1	...	...	...	2	...	3	6
20 & upwards	3	2	4	2	...	1	...	12
Total ...	9	5	12	4	3	8	7	48

[1] Death—otorrhœa and stridor.

In a certain number of doubtful cases (Table LIV.)—sufficiently doubtful to justify the Medical Officers in sending swabs from the throat for examination—no diphtheria bacilli could be demonstrated, and so satisfied were the Medical Officers with this corroboration of their own diagnosis that in no case was antitoxic serum injected. In 1895 there were 322 such cases, with 5 deaths, giving a percentage mortality of 1·55; whilst in 1896 there were 356 such cases, with not a single death.

Different ages of incidence

One most striking feature in connection with these two groups of cases is that amongst the cases which are classed as diphtheria the highest incidence of the disease is between 5 and 15 years of age (see Tables LI., LII., and LIII.), whilst amongst the "tonsillitis" cases (Table LIV.) the highest incidence is from 15 to 20 and upwards.

Value of Bacteriological Examination.

It is evident from a consideration of Tables LIII. and LIV. that the bacteriological examination was of considerable value in helping to distinguish cases of mild diphtheria from cases of true tonsillitis, although it is probable that a few, at any rate, of the cases in which diphtheria bacilli could not be found were, after all, cases of true diphtheria.

TABLE LIII.—Showing Number of cases (at different ages) of "Tonsillitis" in which no Diphtheria bacilli were found but in which Antitoxic Serum was injected.

1895.								1896.									
Ages.	Fountain Hospital.	Western Hospital.	Eastern Hospital.	South-Eastern Hospital.	South-Western Hospital.	North-Western Hospital.	Total.	Ages.	Fountain Hospital.	Western Hospital.	Eastern Hospital.	South-Eastern Hospital.	South-Western Hospital.	North-Western Hospital.	Brook Hospital.	Total.
Under 1	...	1[2]	...	...	3[3,4]	1[5]	5	Under 1	...	1	...	...	...	...	...	1
1 to 2	...	4	...	...	...	1	5	1 to 2	...	1	1	1	2	...	...	5
2 ,, 3	1	6	3	...	1	...	11	2 ,, 3	...	...	1	...	2	...	...	3
3 ,, 4	...	3	...	1	3	...	7	3 ,, 4	...	1	...	...	1	...	...	2
4 ,, 5	...	1	3	...	...	...	4	4 ,, 5	...	1	...	...	...	2	...	3
5 ,, 10	5	13	9	2	4	1	34	5 ,, 10	1	3	2	1	2	...	1	10
10 ,, 15	...	6	5	4	2	1	18	10 ,, 15	...	6	...	1	2	...	...	9
15 ,, 20	2	1	1	2	1	...	7	15 ,, 20	...	...	...	...	...	2	...	2
20 and upwards...	...	7	...	3	...	2	12	20 and upwards...	...	2[6]	...	2	...	...	...	4
Total	8	42	21	12	14	6	103	Total	1	15	4	5	9	4	1	39

[2] Death—Lobar Pneumonia. [3] Death—Follicular Tonsillitis. [6] Death—Rheumatism
[4] Death—Bronchitis. [5] Death—Bronchitis.

TABLE LIV.—Showing Number of cases (at different ages) of "Tonsillitis" in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

1895.									1896.									
Ages.	Fountain Hospital.	Western Hospital.	Eastern Hospital.	South-Eastern Hospital.	South-Western Hospital.	North-Western Hospital.	North-Eastern Hospital.	Total.	Ages.	Fountain Hospital.	Western Hospital.	Eastern Hospital.	South-Eastern Hospital.	South-Western Hospital.	North-Western Hospital.	North-Eastern Hospital.	Brook Hospital.	Total.
Under 1 ..	...	1	2[8]	...	1	...	...	4	Under 1 ...	...	...	...	...	...	...	...	...	...
1 ,, 2 ...	1	1	1	...	...	1	1	5	1 to 2 ...	...	...	...	1	1	...	...	...	2
2 ,, 3 ...	...	2	2	...	...	1	...	5	2 ,, 3 ...	...	2	1	...	1	...	...	...	4
3 ,, 4 ...	...	4	7	1	1	2	...	15	3 ,, 4 ...	...	...	...	...	2	2	...	...	4
4 ,, 5 ...	...	3	2	...	1	1	...	7	4 ,, 5 ...	1	5	2	...	3	...	...	...	11
5 ,, 10 ...	3	20[7]	21[9]	2	16[10]	5	...	67	5 ,, 10 ...	5	15	14	4	12	6	...	4	60
10 ,, 15 ...	8	13	21	4	13	8	4	71	10 ,, 15 ...	5	17	11	7	15	6	...	1	62
15 ,, 20 ...	5	9	17	2	10[11]	2	...	45	15 ,, 20 ...	10	15	12	12	19	6	1	5	80
20 & upwards	15	34	25	3	20	5	1	103	20 & upwards	17	33	22	17	26	12	1	5	133
Total ...	32	87	98	12	62	25	6	322	Total ...	38	87	62	41	79	32	2	15	356

[7] Death—Scarlet Fever. [8] Death—Dentition. [9] Death—Enteritis.
[10] Death—Broncho-Pneumonia. [11] Death—Broncho-Pneumonia.

Cases sent to Convalescent Hospitals.

In Table LV. are recorded the cases (in which diphtheria bacilli were found and which were injected with antitoxin) which were sent to the Convalescent Hospitals during the years 1895-96.

It will be noted that in 1895 there were 12 cases of convalescent scarlet fever which were attacked with diphtheria, 1 succumbing to the disease; 54 cases in which both scarlet fever and diphtheria had been present, 3 of them ultimately succumbing to the latter disease; and 3 convalescent cases of diphtheria in which there appear to have been relapses, one of these cases ending fatally—in all 69 cases, with 5 deaths. In 1896 the figures are very much more favourable, for although in the two Convalescent Hospitals (the Northern and Gore Farm) there were 46 cases of convalescent scarlet fever attacked with diphtheria, 182 convalescent scarlet fever and diphtheria cases, and 8 convalescent diptheria cases, or 236 cases in all, there were only three deaths amongst these cases treated with antitoxic serum. Of the similar cases (Table LVI.) in which no antitoxic serum was used, we have in 1895 122 cases—all presumably very mild—with 1 death; and in 1896 96 similar cases, also with 1 death. So that, taking the two sets of figures together, we have in 1895 191 cases, with 6 deaths, and in 1896 332 cases, with 4 deaths. These results are exceedingly satisfactory from every point of view. Of similar cases sent up for examination in which no diphtheria bacilli were found but in which antitoxic serum was used (Table LVII.), there were 4, all of which recovered, in 1895, and 38, with 1 death, in 1896; whilst of those in which no diphtheria bacilli were found and no antitoxic serum was injected (Table LVIII.), there were 58 in 1895, and 50 in 1896. All of these cases recovered, so that it may be assumed that both clinical and bacteriological diagnoses in these cases were correct, and that they were not cases of diphtheria at all.

TABLE LV.—Showing the Nature of the Disease from which the patients (at different ages) had been suffering when transferred to the Convalescent Hospitals. Examinations for Diphtheria bacilli were not made, or were not recorded as having been made, before the cases were admitted to the Convalescent Hospitals. In the following cases Diphtheria bacilli were found and Antitoxic Serum was injected during stay in the Convalescent Hospitals.

Ages.	1895.			1896.				
	Northern Hospital.			Northern Hospital.			Gore Farm Hospital.	
	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.	Convalescent Diphtheria.	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.	Convalescent Diphtheria.	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.
Under 1 ...	...	...	...	...	...	...	...	...
1 to 2 ...	...	...	...	...	...	...	...	...
2 ,, 3 ...	...	...	...	...	1	...	...	...
3 ,, 4 ...	2	7[2]	2	3	22[6]	1	3	1
4 ,, 5 ...	...	9[3]	1[5]	2	13	...	4	4
5 ,, 10 ...	6[1]	23[4]	...	13[7]	79[8]	5	14	20
10 ,, 15 ...	3	10	...	2	27	2	5	5
15 ,, 20 ...	1	2	...	...	7	...	...	...
20 & upwards	...	3	...	...	2	...	...	1
Total ...	12	54	3	20	151	8	26	31

[1] Death. [2] Death. [3] Death. [4] Death. [5] Death. [6] Death. [7] Death. [8] Death.

TABLE LVI.—Showing the Nature of the Disease from which the patients (at different ages) had been suffering when transferred to the Convalescent Hospitals. Examinations for Diphtheria bacilli were not made, or were not recorded as having been made, before the cases were admitted to the Convalescent Hospitals. In the following cases Diphtheria bacilli were found but no Antitoxic Serum was injected during stay in the Convalescent Hospitals.

Ages.	1895.			1896.				
	Northern Hospital.			Northern Hospital.			Gore Farm Hospital.	
	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.	Convalescent Diphtheria.	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.	Convalescent Diphtheria.	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.
Under 1 ...	...	...	...	...	...	...	...	...
1 to 2 ...	...	...	...	...	...	...	...	...
2 ,, 3 ...	...	1	1	...	...	...	...	...
3 ,, 4 ...	2	4	5	...	6	1	1	...
4 ,, 5 ...	2	8	9	1	6	3	1	...
5 ,, 10 ...	10	34[9]	19	6	23[10]	3	10	2
10 ,, 15 ...	5	12	2	5	8	3	10	...
15 ,, 20 ...	1	3	3	1	5	1	...	...
20 & upwards	1	...	...	...	...	...	...	...
Total ...	21	62	39	13	48	11	22	2

[9] Death. [10] Death.

TABLE LVII.—Showing the Nature of the Disease from which the patients (at different ages) had been suffering when transferred to the Convalescent Hospitals. Examinations for Diphtheria bacilli were not made, or were not recorded as having been made, before the cases were admitted to the Convalescent Hospitals. In the following cases no Diphtheria bacilli were found but Antitoxic Serum was injected during stay in the Convalescent Hospitals.

Ages.	1895.		1896.				
	Northern Hospital.		Northern Hospital.			Gore Farm Hospital.	
	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.	Convalescent Diphtheria.	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.
Under 1	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...
3 ,, 4	...	...	3	...	...	...	1
4 ,, 5	...	...	3	...	...	1	...
5 ,, 10	3	...	10[11]	...	1	1	4
10 ,, 15	...	1	4	1	...	...	1
15 ,, 20	...	...	2	...	...	1	1
20 and upwards...	...	...	3	...	...	...	1
Total	3	1	25	1	1	3	8

[11] Death.

TABLE LVIII.—Showing the Nature of the Disease from which the patients (at different ages) had been suffering when transferred to the Convalescent Hospitals. Examinations for Diphtheria bacilli were not made, or were not recorded as having been made, before the cases were admitted to the Convalescent Hospitals. In the following cases no Diphtheria bacilli were found and no Antitoxic Serum was injected during stay in the Convalescent Hospitals.

Ages.	1895.			1896.			
	Northern Hospital.			Northern Hospital.		Gore Farm Hospital.	
	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.	Convalescent Diphtheria.	Convalescent Scarlet Fever.	Convalescent Diphtheria.	Convalescent Scarlet Fever.	Convalescent Scarlet Fever and Diphtheria.
Under 1	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...
3 ,, 4	2	1	4	2	1	...	...
4 ,, 5 ...	2	...	4	5	...	1	...
5 ,, 10	4	2	26	15	1	7	1
10 ,, 15	2	...	5	8	...	...	...
15 ,, 20	...	...	1	6	...	...	...
20 and upwards...	2	...	3	1	2	...	...
Total	12	3	43	37	4	8	1

ANALYSIS OF CASES IN WHICH NO DIPHTHERIA BACILLI WERE FOUND.

In a certain proportion of the cases sent to the laboratories (see Tables LIII., LIV., LVII., and LVIII.) diphtheria bacilli could not be found, sometimes after repeated examination.

Some of these were undoubtedly cases of diphtheria, and the clinical symptoms were so marked that the physicians in charge considered it advisable to inject antitoxin (Table LIX.*). Many were cases of true diphtheria.

TABLE LIX.—Showing percentage Mortality at different ages of cases in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected. (In the top line is given the day on which antitoxic serum was injected, reckoning from the appearance of the initial symptoms as reported by the Ambulance Nurse.)

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1 ...	1	...	6	3	5	2	3	1	2	1	...	...	1	1	5	3	1	...	24	11	45·8
1 to 2 ...	2	...	9	3	9	5	9	4	5	1	5	3	3	2	17	9	6	2	65	29	44·6
2 ,, 3 ...	1	...	9	2	8	1	19	4	15	3	5	3	7	2	16	4	1	...	81	19	23·4 } 31·5
3 ,, 4 ...	4	...	4	1	10	2	9	4	17	7	11	3	10	7	19	7	8	...	92	31	33·6
4 ,, 5 ...	9	...	7	1	7	1	15	5	15	4	8	2	2	...	14	4	3	1	80	18	22·5
5 ,, 10 ...	22	1	25	1	31	5	39	5	24	5	16	3	14	...	38	7	11	...	220	27	12·2
10 ,, 15 ...	10	...	17	2	20	2	19	1	11	2	7	...	6	1	9	2	2	...	101	10	9·9
15 ,, 20 ...	4	...	4	...	4	...	5	...	3	...	5	2	2	...	3	...	1	...	31	2	6·4
20 and upwards	5	...	7	...	10	1	10	...	10	1	5	1	5	...	6	1	...	...	58	4	6·8
Total ...	58	1	88	13	104	19	128	24	102	24	62	17	50	13	127	37	33	3	752	151	20·07
Mortality per cent.	...	1·7	...	14·7	...	18·2	...	18·7	...	23·5	...	27·4	...	26·0	...	29·1	...	9·09	...	...	...

That a large proportion of these were cases of true diphtheria is evident from the fact that the death-rate amongst them was 20·07 per cent., and of those under 5 years of age 31·5 per cent., although of the cases injected on the first day the death-rate was only 1·7 per cent. This is a very important figure, and one that should be compared with the deaths amongst the whole of the cases in which diphtheria bacilli were not found (Table LX.); for, although the death-rate amongst those injected—probably, of course, the more severe cases—was only 1·7, the death-rate over the whole of the cases was 3·3 per cent. : that is, there was a considerably higher death-rate amongst those in which it was not considered necessary to inject antitoxin, than there was amongst those in which this method of treatment was resorted to. This is a very striking circumstance from the fact

* In these tables are summarised the figures for the several years. In the Appendix (Table XLVA.) are given full lists of all the cases that died, and the complications developed in each case; the time that the patient was in hospital, and the method of treatment—that is, with or without antitoxin—are also recorded. Anyone who wishes to follow these cases, therefore, will be able to check the statistics given and the statements made throughout this Report.

that all the other figures are exactly the reverse of this: that is, the greatest number of cases died where antitoxin is used, as these are the cases which, in spite of the absence of the diphtheria bacillus—an absence which is comparatively easily explained when the examination is made at the later stages of the disease—were, clinically, comparatively severe forms of diphtheria, and were treated as such by the physicians. Although the death-rate over the total cases is 20·07 per cent., that amongst the cases in which diphtheria bacilli were not found and which were not treated with antitoxin was only 10·7 per cent. (Table LX.), the fall in the mortality being specially marked in the later years—from 5 upwards. Before 5 years of age, although there is a considerable difference in the mortality between those cases injected and those not, the difference is not so great as in the later years, being 24·4 as compared with 31·5 per cent.

Most fatal under 5 years.

TABLE LX.—Showing percentage Mortality at different ages of all cases that have been bacteriologically examined and in which no Diphtheria bacilli were found. (Showing day of disease, taken from Ambulance Nurse's Report.)

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No History.		?		Total.		Mortality per Cent.	
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	1	...	11	7	8	3	8	3	6	2	6	3	2	2	10	6	1	1	2	1	55	28	50·9	
1 to 2	4	...	23	6	28	10	19	8	15	4	13	5	7	3	31	12	...	...	3	2	143	50	34·9	
2 ,, 3	5	1	28	10	33	9	39	6	27	9	14	5	20	1	32	10	1	...	2	2	201	53	26·3	24·4
3 ,, 4	27	2	29	2	41	6	45	9	39	14	26	5	17	6	57	12	1	...	2	...	284	56	19·7	
4 ,, 5	25	2	37	3	53	8	44	9	30	4	29	6	17	4	48	11	1	1	4	2	288	50	17·3	
5 ,, 10	102	2	123	10	156	13	147	10	107	11	91	8	55	1	124	15	5	...	7	1	917	71	7·7	
10 ,, 15	43	1	83	1	105	3	104	4	64	3	55	2	20	2	65	5	2	...	1	...	542	21	3·8	
15 ,, 20	15	...	44	...	62	...	59	1	36	2	31	3	15	...	30	1	3	...	2	...	297	7	2·3	
20 and upwards ...	18	...	63	2	103	2	106	1	76	3	41	1	35	1	60	2	1	...	5	...	508	12	2·3	
Total	240	8	441	41	589	54	571	51	400	52	306	38	188	20	457	74	15	2	28	8	3,235	348	10·7	
Mortality per cent. ...	...	3·3	...	9·2	...	9·1	...	8·9	...	13·0	...	12·4	...	10·6	...	16·1	...	13·3	...	28·5	...	...	...	

On analysing these figures, we find that in 1895 (Tables LXI., LXII., LXIII.), of these somewhat doubtful cases, 114 of the non-injected cases that came under treatment on the first day 3 died, whilst of 10 cases injected on the first day every one recovered. After that period the figures correspond relatively, fairly accurately, with the totals. We find that of 335 cases injected, 61, or 18·2 per cent., died; whilst of 1,136 cases not injected, 100, or 8·8 per cent., died—giving a mortality over the whole of 10·9 per cent. It will be noted that the mortality in children up to 5 years of age is still very high, whether the patients be injected or not; this, of course, from a consideration of the total mortality, we should expect to be the case.

TABLE LXI.—Showing percentage Mortality at different ages of all cases that have been bacteriologically examined during 1895 and in which no Diphtheria bacilli were found. (Showing day of disease, taken from Ambulance Nurse's Report.)

1895.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No History.		?		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1 ...	...	...	6	3	3	1	2	1	3	2	4	2	2	2	7	4	1	1	1	...	29	16	55·1
1 to 2 ...	3	...	11	2	13	5	8	5	6	2	8	3	3	1	13	4	...	...	3	2	68	24	35·2
2 ,, 3 ...	1	...	17	6	15	2	16	2	10	5	3	...	9	...	14	4	...	...	1	1	86	20	23·2
3 ,, 4 ...	18	2	12	1	15	2	24	5	18	10	14	2	6	3	23	4	...	...	2	...	132	29	21·9
4 ,, 5 ...	12	1	21	2	23	4	18	5	8	1	9	2	1	1	15	3	...	...	3	1	110	20	18·1
5 ,, 10 ...	52	...	78	6	71	5	63	5	54	5	37	5	16	...	46	7	3	...	5	1	425	34	8·0
10 ,, 15 ...	18	...	51	1	53	2	47	2	26	...	21	2	7	...	28	1	...	...	1	...	252	8	3·1
15 ,, 20 ...	3	...	24	...	27	...	26	...	12	1	12	2	9	...	8	1	...	...	2	...	123	4	3·2
20 & upwards	7	...	27	1	63	1	58	1	32	3	20	...	10	...	25	...	...	...	4	...	246	6	2·4
Total ...	114	3	247	22	283	22	262	26	169	29	128	18	63	7	179	28	4	1	22	5	1,471	161	10·9
Mortality per cent.	...	2·6	...	8·9	...	7·7	...	9·9	...	17·1	...	14·06	...	11·1	...	15·6	...	25·0	...	22·7	...	...	...

Table LXII.—Showing percentage Mortality at different ages of cases examined during 1895 in which no Diphtheria bacilli were found but in which Antitoxic Serum was injected. (In the top line is given the day on which antitoxic serum was injected, reckoning from the appearance of the initial symptoms as reported by Ambulance Nurse.)

1895.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	3	1	3	1	1	1	2	1	...	...	1	1	2	2	...	...	12	7	58·3
1 to 2	1	...	5	2	5	3	5	3	...	...	2	1	2	2	6	3	4	1	30	15	50·0
2 ,, 3	...	...	5	1	6	...	8	1	4	1	...	...	3	...	7	2	...	...	33	5	15·1
3 ,, 4	...	...	2	1	3	...	6	2	8	4	5	1	6	4	9	2	5	...	44	14	31·8
4 ,, 5	1	...	3	1	2	...	5	2	5	1	2	...	...	...	4	1	1	...	23	5	21·7
5 ,, 10	5	...	16	1	11	...	19	2	13	3	9	1	5	...	12	2	7	...	97	9	9·2
10 ,, 15	3	...	15	2	12	1	8	1	2	...	4	...	2	...	2	...	1	...	49	4	8·1
15 ,, 20	...	...	3	...	1	...	3	...	2	...	2	...	2	...	...	...	1	...	14	...	0·0
20 and upwards	...	...	5	...	10	1	7	...	5	1	2	...	1	...	3	...	...	...	33	2	6·06
Total	10	...	57	9	53	6	62	12	41	11	26	3	22	7	45	12	19	1	335	61	18·2
Mortality per cent.	...	0·0	...	15·7	...	11·3	...	19·3	...	26·8	...	11·5	...	31·8	...	26·6	...	5·2	...	...	...

Table LXIII.—Showing percentage Mortality at different ages of cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

1895.

Ages.	Number of Cases.	Number of Deaths.	Mortality per Cent.
Under 1	17	9	52·9
1 to 2	38	9	23·6
2 ,, 3	53	15	28·3
3 ,, 4	88	15	17·04
4 ,, 5	87	15	17·2
5 ,, 10	328	25	7·6
10 ,, 15	203	4	1·9
15 ,, 20	109	4	3·6
20 and upwards...	213	4	1·8
Total	1,136	100	8·8

In 1896 (Tables LXIV., LXV., LXVI.) the figures tell much the same tale that they do in 1895. Only 1 death occurred amongst the antitoxin cases injected on the first day, giving a mortality of 2·08 per cent., whilst amongst the whole of the cases the percentage mortality treated on the first day was 3·9. The mortality amongst the antitoxin-treated cases is 21·5, whilst amongst the cases in which no antitoxin was injected it is very low after the third year; but amongst children under 1 year of age the mortality is considerably higher amongst the uninjected cases than it is amongst the injected—in the one case (on a small number of cases) being 57·1 per cent., in the other 33·3. A somewhat remarkable feature of these percentage mortalities is that they undergo considerable variations from 1 year upwards. Comparison of antitoxin and non-antitoxin cases.

Table LXIV.—Showing percentage Mortality at different ages of all cases that have been bacteriologically examined and in which no Diphtheria bacilli were found. (Showing day of disease, taken from Ambulance Nurse's Report.)

1896.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No History.		?		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1...	1	...	5	4	5	2	6	2	3	...	2	1	...	...	3	2	...	...	1	1	26	12	46·1
1 to 2...	1	...	12	4	15	5	11	3	9	2	5	2	4	2	18	8	...	...	...	...	75	26	34·6
2 ,, 3...	4	1	11	4	18	7	23	4	17	4	11	5	11	1	18	6	1	...	1	1	115	33	28·6
3 ,, 4...	9	...	17	1	26	4	21	4	21	4	12	3	11	3	34	8	1	...	...	...	152	27	17·7
4 ,, 5...	13	1	16	1	30	4	26	4	22	3	20	4	16	3	33	8	1	1	1	1	178	30	16·8
5 ,, 10...	50	2	45	4	85	8	84	5	53	6	54	3	39	1	78	8	2	...	2	...	492	37	7·5
10 ,, 15...	25	1	32	...	52	1	57	2	38	3	34	...	13	2	37	4	2	...	...	...	290	13	4·4
15 ,, 20...	12	...	20	...	35	...	33	1	24	1	19	1	6	...	22	...	3	...	...	...	174	3	1·7
20 & upwards	11	...	36	1	40	1	48	...	44	...	21	1	25	1	35	2	1	...	1	...	262	6	2·2
Total ...	126	5	194	19	306	32	309	25	231	23	178	20	125	13	278	46	11	1	6	3	1,764	187	10·6
Mortality per cent.	...	3·9	...	9·7	...	10·4	...	8·09	...	9·9	...	11·2	...	10·4	...	16·5	...	9·09	...	50·0	...	...	...

TABLE LXV.—Showing percentage Mortality at different ages of cases in which no Diphtheria bacilli were found but in which Antitoxic Serum was injected. (In the top line is given the day on which antitoxic serum was injected, reckoning from the appearance of the initial symptoms as reported by the Ambulance Nurse.)

1896.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per Cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	1	...	3	2	2	1	2	...	...	...	...	...	...	...	3	1	1	...	12	4	33·3
1 to 2	1	...	4	1	4	2	4	1	5	1	3	2	1	...	11	6	2	1	35	14	40·0
2 ,, 3	1	...	4	1	2	1	11	3	11	2	5	3	4	2	9	2	1	...	48	14	29·1
3 ,, 4	4	...	2	...	7	2	3	2	9	3	6	2	4	3	10	5	3	...	48	17	35·4
4 ,, 5	8	...	4	...	5	1	10	3	10	3	6	2	2	...	10	3	2	1	57	13	22·8
5 ,, 10	17	1	9	...	20	5	20	3	11	2	7	2	9	...	26	5	4	...	123	18	14·6
10 ,, 15	7	...	2	...	8	1	11	...	9	2	3	...	4	1	7	2	1	...	52	6	11·5
15 ,, 20	4	...	1	...	3	...	2	...	1	...	3	2	...	...	3	...	...	...	17	2	11·7
20 and upwards	5	...	2	...	...	...	3	...	5	...	3	1	4	...	3	1	...	...	25	2	8·0
Total	48	1	31	4	51	13	66	12	61	13	36	14	28	6	82	25	14	2	417	90	21·5
Mortality per cent.	...	2·08	...	12·9	...	25·4	...	18·1	...	21·3	...	38·8	...	21·4	...	30·4	...	14·2	...	...	...

TABLE LXVI.—Showing percentage Mortality at different ages of cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

1896.

Ages.	Cases.	Deaths.	Mortality per cent.
Under 1	14	8	57·1
1 to 2	40	12	30·0
2 ,, 3	67	19	28·3
3 ,, 4	104	10	9·6
4 ,, 5	121	17	14·04
5 ,, 10	369	19	5·1
10 ,, 15	238	7	2·9
15 ,, 20	157	1	0·6
20 and upwards...	237	4	1·6
Total	1,347	97	7·2

These variations may to a certain extent be accounted for by the fact that the numbers admitted and put under treatment at different days varied very considerably; so that, unless the proportion of these figures is carefully examined, the figures in the final column, in which the death-rate is given, may be very misleading: the more cases that come under treatment before the end of the third day, the lower should be the death-rate.

EXTENT AND POSITION OF MEMBRANE.

In young children

In Table LXVII. are given the cases examined in 1895 (in which no diphtheria bacilli were found), arranged according to the parts affected. The mortality amongst them, as already stated, was only 10·9 per cent. On coming to analyse the figures, it will be seen that there are two classes of cases which stand out as being specially fatal in character, and which, therefore, were probably cases of true diphtheria although no bacilli could be found. These are, (1) the cases—comparatively few in number—in which young children were affected, and where the opportunities of obtaining good swabs were certainly fewer and more uncertain than in the case of adults;

Laryngeal cases.

and (2) laryngeal cases, where this difficulty is also very greatly in evidence. Although the cases that come under these headings are comparatively few in number, they play a very

Effect on percentage mortality.

important part in determining the percentage mortality. For example, we find that amongst the children under 1 year in this class there was a death-rate of 54·1 per cent. in faucial cases, and of 60 per cent. in the laryngeal cases; the death-rate continues high until the end of the fourth year, the cases in this group accounting for a very large proportion of the whole mortality. Thus, amongst the faucial cases up to this age there is a death-rate of 27 per cent., and amongst the laryngeal cases of 36·5 per cent., as against 5·99 for faucial cases over 4 years of age, and 18·18 for laryngeal cases after that age; the whole laryngeal mortality being 30·1, against 10·08 of faucial cases. These figures are still more striking when we come to deal with the cases treated with antitoxin (Table LXVIII.) and compare them with those not so treated (Table LXIX.). It is at once evident indeed from these tables that the majority of the errors made in bacteriological diagnosis are to be met with amongst (*a*) very young children, and (*b*) where the larynx is affected. It must, therefore, be accepted that, owing to the difficulty of applying the swab to the seat of the disease, no diphtheria bacilli have been transferred from the throat to the medium in a considerable number of cases in which, were it possible to take the swab under better conditions, the presence of diphtheria bacilli would probably have been demonstrated.

TABLE LXVII.—Showing the site of the affection in those cases in which no Diphtheria bacilli were found. The total Deaths and percentage Mortality amongst these sets of cases at different ages are also shown.

1895.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	18	6	3	2	...	29	24	5	8	5	1	2	...	16	13	3	54·1	60·0
1 to 2	40	15	11	2	...	68	55	13	12	6	4	2	...	24	18	6	32·7	46·1
2 ,, 3	58	18	6	4	...	86	76	10	14	4	1	1	...	20	18	2	23·6	20·0
3 ,, 4	88	31	13	...	...	132	119	13	12	13	4	...	...	29	25	4	21·008	30·7
4 ,, 5	85	21	3	1	...	110	106	4	14	6	...	...	...	20	20	...	18·8	0·0
5 ,, 10	361	51	12	1	...	425	412	13	26	6	2	...	...	34	32	2	7·7	15·3
10 ,, 15	231	19	2	...	...	252	250	2	7	1	...	...	...	8	8	...	3·2	0·0
15 ,, 20	121	2	...	...	...	123	123	...	4	...	...	...	...	4	4	...	3·2	0·0
20 and upwards...	240	3	3	...	...	246	243	3	4	...	2	...	...	6	4	2	1·6	66·6
Total... ...	1242	166	53	10	...	1471	1408	63	101	41	14	5	...	161	142	19	10·08	30·1
Mortality per cent.	...	...	...	...	...	...	...	...	8·1	24·6	26·4	50·0	0·0	10·9	...	...	...	...

TABLE LXVIII.—Showing the site of the affection in those cases in which no Diphtheria bacilli were found but in which Antitoxic Serum was injected. The total Deaths and percentage Mortality amongst these sets of cases at different ages are also shown.

1895.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	8	3	...	1	...	12	11	1	4	2	...	1	...	7	6	1	54·5	100·0
1 to 2	15	8	6	1	...	30	23	7	7	4	3	1	...	15	11	4	47·8	57·1
2 ,, 3	20	8	4	1	...	33	28	5	2	3	...	...	...	5	5	...	17·8	0·0
3 ,, 4	21	14	9	...	...	44	35	9	5	5	4	...	...	14	10	4	28·5	44·4
4 ,, 5	12	9	2	...	...	23	21	2	2	3	...	...	...	5	5	...	23·8	0·0
5 ,, 10	74	13	9	1	...	97	87	10	4	3	2	...	...	9	7	2	8·04	20·0
10 ,, 15	40	7	2	...	...	49	47	2	3	1	...	...	...	4	4	...	8·5	0·0
15 ,, 20	14	...	...	...	...	14	14	...	...	...	...	...	...	0	...	...	0·0	0·0
20 and upwards ...	32	...	1	...	...	33	32	1	1	...	1	...	...	2	1	1	3·1	100·0
Total	236	62	33	4	...	335	298	37	28	21	10	2	...	61	49	12	16·4	32·4
Mortality per cent.	...	...	...	...	...	...	...	...	11·8	33·8	30·3	50·0	0·0	18·2	...	...	...	...

TABLE LXIX.—Showing the site of the affection in those cases in which no Diphtheria bacilli were found but in which no Antitoxic Serum was injected. The total Deaths and percentage Mortality amongst these sets of cases at different ages are also shown.

1895.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	10	3	3	1	...	17	13	4	4	3	1	1	...	9	7	2	53·8	50·0
1 to 2 ...	25	7	5	1	...	38	32	6	5	2	1	1	...	9	7	2	21·8	33·3
2 ,, 3	38	10	2	3	...	53	48	5	12	1	1	1	...	15	13	2	27·08	40·0
3 ,, 4	67	17	4	...	...	88	84	4	7	8	...	...	...	15	15	...	17·8	0·0
4 ,, 5	73	12	1	1	...	87	85	2	12	3	...	...	...	15	15	...	17·6	0·0
5 ,, 10	287	38	3	...	...	328	325	3	22	3	...	...	...	25	25	...	7·6	0·0
10 ,, 15	191	12	...	...	...	203	203	...	4	...	...	...	...	4	4	...	1·9	0·0
15 ,, 20	107	2	...	...	...	109	109	...	4	...	...	...	...	4	4	...	3·6	0·0
20 and upwards ..	208	3	2	...	...	213	211	2	3	...	1	...	...	4	3	1	1·4	50·0
Total	1006	104	20	6	...	1136	1110	26	73	20	4	3	...	100	93	7	8·8	26·9
Mortality per cent.	...	...	...	...	...	...	...	...	7·2	19·2	20·0	50·0	0·0	8·8	...	...	...	...

In 1896 (Tables LXX., LXXI., and LXXII.) the figures, as a whole, are much the same, although the mortality in both faucial and laryngeal cases has now fallen somewhat—from 10·08 per cent. amongst the faucial cases to 9·7, and from 30·1 to 29·1 amongst the laryngeal cases—the fall being especially well marked in cases under 1 year of age. In the second year, however, there is a rise, which continues on to the third year; after that the figures are somewhat irregular; but when we come to deal with those cases in which no diphtheria bacilli were found but which were treated with antitoxin, a marked fall is met with in the first and second years; after that, however, there is a rise—so marked, indeed, that we have amongst these a death-rate nearly as high as that amongst the injected cases in which diphtheria bacilli were found: this rise, however, is principally amongst the faucial cases, the death-rate amongst the laryngeal cases falling from 32·4 to 27·5. Amongst the non-injected cases the death-rate is only 7·2 per cent.—6·7 in the faucial cases (the lowest death-rate recorded), and 33·3 amongst the laryngeal cases; this latter percentage, however, being calculated on a very small number of cases (21). There can be no doubt, however, that in 1896 the death-rate was very low indeed; and if the children under 3 years of age—in which, as above stated, the difficulty of diagnosis is very great—had been left out, the mortality would have been very insignificant.

High death-rate amongst laryngeal cases.

Table LXX.—Showing the site of the affection in those cases in which no Diphtheria bacilli were found. The total Deaths and percentage Mortality amongst these sets of cases at different ages are also shown.

1896.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	13	6	6	1	...	26	19	7	6	3	2	1	...	12	9	3	47·3	42·8
1 to 2	41	27	6	1	...	75	68	7	10	12	4	...	...	26	22	4	32·3	57·1
2 ,, 3	68	33	8	6	...	115	101	14	20	10	1	2	...	33	30	3	29·7	21·4
3 ,, 4	110	27	12	3	...	152	137	15	11	11	3	2	...	27	22	5	16·05	33·3
4 ,, 5	121	37	15	4	1	178	158	20	10	15	3	2	...	30	25	5	15·8	25·0
5 ,, 10	410	67	11	4	...	492	477	15	24	10	2	1	...	37	34	3	7·1	20·0
10 ,, 15	269	20	...	1	...	290	289	1	9	4	...	...	...	13	13	...	4·4	0·0
15 ,, 20	170	4	...	...	...	174	174	...	2	1	...	...	...	3	3	...	1·7	0·0
20 and upwards ...	249	13	...	...	...	262	262	...	4	2	...	...	...	6	6	...	2·2	0·0
Total	1451	234	58	20	1	1764	1685	79	96	68	15	8	...	187	164	23	9·7	29·1
Mortality per cent.	...	...	...	...	...	...	...	...	6·6	29·05	25·8	40·0	0·0	10·6	...	...	...	...

Table LXXI.—Showing the site of the affection in those cases in which no Diphtheria bacilli were found but in which Antitoxic Serum was injected. The total Deaths and percentage Mortality amongst these sets of cases at different ages are also shown.

1896.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	2	3	6	1	...	12	5	7	1	...	2	1	...	4	1	3	20·0	42·8
1 to 2	16	13	5	1	...	35	29	6	4	7	3	...	...	14	11	3	37·9	50·0
2 ,, 3	25	14	5	4	...	48	39	9	9	5	...	...	...	14	14	...	35·8	0·0
3 ,, 4	27	9	10	2	...	48	36	12	6	6	3	2	...	17	12	5	33·3	41·6
4 ,, 5	30	16	9	1	1	57	46	11	3	8	2	...	...	13	11	2	23·9	18·1
5 ,, 10	86	24	10	3	...	123	110	13	9	6	2	1	...	18	15	3	13·6	23·07
10 ,, 15	42	10	...	...	...	52	52	...	3	3	...	...	...	6	6	...	11·5	0·0
15 ,, 20	14	3	...	...	...	17	17	...	1	1	...	...	...	2	2	...	11·7	0·0
20 and upwards ...	21	4	...	...	...	25	25	...	1	1	...	...	...	2	2	...	8·0	0·0
Total	263	96	45	12	1	417	359	58	37	37	12	4	...	90	74	16	20·6	27·5
Mortality per cent.	...	...	...	...	...	...	...	...	14·06	38·5	26·6	33·3	0·0	21·5	...	...	...	...

TABLE LXXII.—Showing the site of the affection in those cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected. The total Deaths and percentage Mortality amongst these sets of cases at different ages are also shown.

1896.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	11	3	...	...	...	14	14	...	5	3	...	...	...	8	8	...	57·1	0·0
1 to 2	25	14	1	...	...	40	39	1	6	5	1	...	...	12	11	1	28·2	100·0
2 ,, 3	43	19	3	2	...	67	62	5	11	5	1	2	...	19	16	3	25·8	60·0
3 ,, 4	83	18	2	1	...	104	101	3	5	5	...	...	...	10	10	...	9·9	0·0
4 ,, 5	91	21	6	3	...	121	112	9	7	7	1	2	...	17	14	3	12·5	33·3
5 ,, 10	324	43	1	1	...	369	367	2	15	4	...	...	...	19	19	...	5·1	0·0
10 ,, 15	227	10	...	1	...	238	237	1	6	1	...	...	...	7	7	...	2·9	0·0
15 ,, 20	156	1	...	...	...	157	157	...	1	...	...	...	...	1	1	...	0·6	0·0
20 and upwards ...	228	9	...	...	...	237	237	...	3	1	...	...	...	4	4	...	1·6	0·0
Total	1188	138	13	8	...	1347	1326	21	59	31	3	4	...	97	90	7	6·7	33·3
Mortality per cent.	...	...	...	...	...	...	...	...	4·9	22·4	23·07	50·0	0·0	7·2	...	...	...	...

Average time that patients remained in hospital.

The average time in hospital of the cases that recovered and were injected (Table LXXIII.) is considerably higher in 1896 than in 1895, rising from 48·05 to 63·7 days; this indicates one of two things, or perhaps both. In the first place, more severe cases recovered, and such severe cases had to be kept under observation for a lengthened period. Here also is an indication that more care was exercised to detain the patients in hospital until the danger of infection had disappeared, or, at any rate, had become greatly modified. As regards injected cases that died, it will be observed that the average stay in hospital was practically the same in both 1895 and 1896. Of the cases not injected with antitoxin (Table LXXIV.) exactly the reverse state of affairs is found. Where the patients recovered the stay in hospital averaged 40·9 days in 1895, and 40·4 days in 1896; whilst of the cases that died the average period in hospital in 1895 was 12·09, and in 1896 16·4. These latter sets of figures appear to indicate that a considerably larger proportion of the severe cases were injected with antitoxin in 1896 than in 1895; it will be gathered from this that a large number of non-diphtheritic cases—acute angina and similar conditions leading to suppurative and ulcerative changes in the throat—have to be included in the 1896 table amongst those not injected with antitoxin in which no Diphtheria bacilli were found but in which death occurred.

TABLE LXXIII.—Showing cases (at different ages) in which no Diphtheria bacilli were found but Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of days in hospital is given under each heading.

1895.

Recoveries.				Deaths.			
Ages.	Number of Cases.	Number of Days.	Average.	Ages.	Number of Cases.	Number of Days.	Average.
Under 1	5	210	42·0	Under 1	7	83	11·8
1 to 2	15	851	56·7	1 to 2	15	114	7·6
2 ,, 3	28	1,360	48·5	2 ,, 3	5	106	21·2
3 ,, 4	30	1,961	65·3	3 ,, 4	14	219	15·6
4 ,, 5	18	1,116	62·0	4 ,, 5	5	104	20·8
5 ,, 10	88	4,067	46·2	5 ,, 10	9	111	12·3
10 ,, 15	45	1,932	42·9	10 ,, 15	4	37	9·2
15 ,, 20	14	587	41·9	15 ,, 20	...	...	...
20 and upwards	31	1,084	34·9	20 and upwards	2	23	11·5
Total	274	13,168	48·05	Total	61	797	13·06

1896.

Recoveries.				Deaths.			
Ages.	Number of Cases.	Number of Days.	Average.	Ages.	Number of Cases.	Number of Days.	Average.
Under 1	8	473	59·1	Under 1	4	65	16·2
1 to 2	21	1,241	59·09	1 to 2	14	131	9·3
2 ,, 3	34	2,280	67·05	2 ,, 3	14	223	15·9
3 ,, 4	31	2,109	68·03	3 ,, 4	17	185	10·8
4 ,, 5	44	2,942	66·8	4 ,, 5	13	296	22·7
5 ,, 10	105	6,734	64·1	5 ,, 10	18	283	15·7
10 ,, 15	46	3,002	65·2	10 ,, 15	6	41	6·8
15 ,, 20	15	738	49·2	15 ,, 20	2	12	6·0
20 and upwards	23	1,322	57·4	20 and upwards	2	7	3·5
Total	327	20,841	63·7	Total	90	1,243	13·8

TABLE LXXIV.—Showing cases (at different ages) in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of days in hospital is given under each heading.

1895.

Recoveries.				Deaths.			
Ages.	Number of Cases.	Number of Days.	Average.	Ages.	Number of Cases.	Number of Days.	Average.
Under 1	8	203	25·3	Under 1	9	120	13·3
1 to 2	29	1,232	42·4	1 to 2	9	79	8·7
2 „ 3	38	2,124	55·8	2 „ 3	15	109	7·2
3 „ 4	73	4,095	56·09	3 „ 4	15	179	11·9
4 „ 5	72	3,905	54·2	4 „ 5	15	328	21·8
5 „ 10	303	15,415	50·8	5 „ 10	25	290	11·6
10 „ 15	199	7,974	40·07	10 „ 15	4	61	15·2
15 „ 20	105	3,070	29·2	15 „ 20	4	24	6·0
20 and upwards	209	4,366	20·8	20 and upwards	4	19	4·7
Total	1,036	42,384	40·9	Total	100	1,209	12·09

1896.

Under 1	6	192	32·0	Under 1	8	116	14·5
1 to 2	28	1,352	48·2	1 to 2	12	133	11·08
2 „ 3	48	3,332	69·4	2 „ 3	19	313	16·4
3 „ 4	94	5,814	61·8	3 „ 4	10	156	15·6
4 „ 5	104	4,852	46·6	4 „ 5	17	304	17·8
5 „ 10	350	17,025	48·6	5 „ 10	19	315	16·5
10 „ 15	231	9.025	39·06	10 „ 15	7	153	21·8
15 „ 20	156	3,978	25·5	15 „ 20	1	5	5·0
20 and upwards	233	5,032	21·5	20 and upwards	4	97	24·2
Total	1,250	50,602	40·4	Total	97	1,592	16·4

TRACHEOTOMY CASES.

In a certain number of cases in which no Diphtheria bacilli were found, the interference with respiration was so marked that it became necessary to perform tracheotomy (Tables LXXV., LXXVI.); many of these must therefore, of course, be looked upon as cases of true diphtheria. In 1895 there were 16 such cases, of which 13 were injected. Of the injected cases 53·8 per cent. died, whilst of the uninjected cases 2 out of 3 recovered. It will be noted, however, that most of the fatal cases amongst those injected occurred in children under 4 years of age; after that age the tracheotomy cases were not nearly so fatal. In 1896 the number of tracheotomies done in cases in which no Diphtheria bacilli were found rises to 31; 24 of these cases were injected, 8, or 33 per cent., succumbing, whilst of the uninjected cases 3 out of 7 died, or 42·8 per cent. Here again the mortality is specially marked in cases under 4 years of age; after that age only one case out of 12, or 8·5 per cent., of those injected died. These cases should, of course, be added to the true diphtheria cases, as, clinically, there could be no doubt as to the nature of the disease, although bacteriological examination had given a negative result.

TABLE LXXV.—Showing percentage Mortality at different ages of cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected but Tracheotomy was performed.

1895.				1896.			
Ages.	Cases.	Deaths.	Mortality per Cent.	Ages.	Cases.	Deaths.	Mortality per Cent.
Under 1	...	...	0·0	Under 1	...	...	0·0
1 to 2	...	...	0·0	1 to 2	1	1	100·0
2 „ 3	1	1	100·0	2 „ 3	2	1	50·0
3 „ 4	...	...	0·0	3 „ 4	2	...	0·0
4 „ 5	1	...	0·0	4 „ 5	1	1	100·0
5 „ 10	1	...	0·0	5 „ 10	1	...	0·0
10 „ 15	...	...	0·0	10 „ 15	...	...	0·0
15 „ 20	...	...	0·0	15 „ 20	...	...	0·0
20 and upwards	...	...	0·0	20 and upwards	...	...	0·0
Total	3	1	33·3	Total	7	3	42·8

TABLE LXXVI.—Showing percentage Mortality at different ages of cases in which no Diphtheria bacilli were found but in which Tracheotomy was performed and Antitoxic Serum was injected.

1895. Ages.	Cases.	Deaths.	Mortality per Cent.	1896. Ages.	Cases.	Deaths.	Mortality per Cent.
Under 1	1	1	100·0	Under 1	1	1	100·0
1 to 2	2	1	50·0	1 to 2	4	3	75·0
2 ,, 3	1	...	0·0	2 ,, 3	2	2	100·0
3 ,, 4	4	3	75·0	3 ,, 4	5	1	20·0
4 ,, 5	2	1	50·0	4 ,, 5	4	...	0·0
5 ,, 10	3	1	33·3	5 ,, 10	8	1	12·5
10 ,, 15	...	...	0·0	10 ,, 15	...	...	0·0
15 ,, 20	...	...	0·0	15 ,, 20	...	...	0·0
20 and upwards	...	...	0·0	20 and upwards	...	...	0·0
Total	13	7	53·8	Total	24	8	33·3

COMPLICATIONS.

Taking now the complications that occurred in 1895 amongst notified cases of diphtheria *Albuminuria.* in which no diphtheria bacilli were found (Tables LXXVII., LXXVIII.), we find that a considerable number of cases of albuminuria are met with only at one hospital—the South-Eastern—and here it must be assumed that this complication is due in great measure to the presence of scarlet fever. In this hospital 50·5 per cent. on 45 cases injected with antitoxin developed albuminuria, and 25·1 on 33 cases in which no antitoxin was given. In the North-Eastern Hospital there were 29 cases of albuminuria—29·2 per cent.—none of which were treated with antitoxin.

The percentage of cases in which vomiting occurred was much higher amongst those that *Vomiting.* were injected with antitoxin than amongst those that were not so treated, although the actual number of cases was smaller—30 cases injected, with a percentage of 8·9, against 43 cases not injected, with a percentage of 3·7. Amongst the uninjected cases the percentage would have been very low indeed had it not been that in the Northern Hospital there were 10 cases—17·2 per cent.

As regards anuria, there were actually more cases amongst those not treated with antitoxin *Anuria.* than amongst those injected, although the percentage was lower—0·6 against 1·4.

Of the other complications it is interesting to notice that the most important are *Adenitis.* adenitis and nephritis; 39 cases of adenitis, with a percentage of 11·6 of the whole, being treated with antitoxin; 72, with a percentage of 6·3, were not so treated. Amongst these cases nephritis *Nephritis.* occurred in 6 injected cases and in 33 non-injected cases; this, again, affording evidence that a number of the cases were really cases of scarlatina. The other complications are comparatively *Other complications.* unimportant in this year, but it must be borne in mind that the complications above mentioned do occur—first of all in cases which, bacteriologically, were not proved to be diphtheritic, and, secondly, in those cases in which no antitoxin was injected; so that we have here additional evidence of the fact that the complications met with during the course of an attack of diphtheria in which antitoxin is injected are not, as many people would have us believe, due to the use of antitoxin.

In 1896, when, as we know, a careful outlook was being kept for the appearance of *Albuminuria.* albuminuria, we find that there is a considerable rise in the number of cases in which this condition was noted—138, or 33·09 per cent., amongst those injected with antitoxin, and 213, or a percentage of 15·8, amongst those not injected.

The percentage of cases of vomiting is also fairly high, being again higher amongst the *Vomiting.* injected than amongst the uninjected cases. As regards adenitis, the percentage varies from 2·3 in *Adenitis.* the South-Eastern Hospital to 38·09 in the North-Western, giving an average of 9·8 amongst the injected cases; whilst amongst the uninjected cases the lowest was 0·8 per cent. at the South-Western Hospital, and the highest 11·8 per cent. at the North-Western Hospital, the average being 4·5 per cent—61 cases out of 1,347. As regards nephritis, what holds good in 1895 also maintains *Nephritis.* in 1896. Amongst the injected cases there were only 5, or 1·1 per cent., whilst amongst the uninjected cases the number was 22—1·6 per cent. The notes concerning the other complications made for the 1895 cases apply fairly accurately to the 1896 cases. It will be noticed that amongst those cases in which diphtheria bacilli were not found the number of moribund cases—that is, cases *Moribund cases.* which succumbed within the first 48 hours after admission—is exceedingly small. In 1895 (Tables LXXIX., LXXX.) there were only 23 such cases, of which 7 were injected with antitoxin, and 16 received no antitoxin. There can be little doubt that many of the 7 were cases of true diphtheria, and it is probable that certain of the 16 were also cases of this disease; though only those that were injected, with the exception of a small number which died almost immediately after their admission into hospital, were probably looked upon as being clinically cases of diphtheria. In 1896 the moribund cases in this group had fallen still lower, being only 4, or 0·8 per cent., of those injected, and 10, or 0·7 per cent., of those not injected. From this it may be argued, first, that in this year greater care was taken to get the patients into hospital as early as possible; second, that a larger proportion of cases lived beyond the 48 hours than in previous years; third, that antitoxin was given in a larger proportion of the severe cases; and, fourth, that the diagnosis, both clinical and bacteriological, was slightly more accurate in this year than in the previous one. All these points, however, come out in other parts of the Report, and need not here be further insisted upon.

TABLE LXXVII.—Showing Complications occurring in cases in which no Diphtheria bacilli were found but in which Antitoxic Serum was injected. The second column under each heading gives the percentage of these cases on all cases injected with antitoxic serum.

1895.

Hospitals.	Albuminuria.	Percentage on all cases injected with Antitoxic Serum.	Vomiting.	Percentage on all cases injected with Antitoxic Serum.	Anuria.	Percentage on all cases injected with Antitoxic Serum.	Urine Scanty.	Percentage on all cases injected with Antitoxic Serum.	Adenitis.	Percentage on all cases injected with Antitoxic Serum.	Nephritis.	Percentage on all cases injected with Antitoxic Serum.	Joint Pains.	Percentage on all cases injected with Antitoxic Serum.	Injection Abscess.	Percentage on all cases injected with Antitoxic Serum.	Cervical Abscess.	Percentage on all cases injected with Antitoxic Serum.	Pyrexia.	Percentage on all cases injected with Antitoxic Serum.	Otitis.	Percentage on all cases injected with Antitoxic Serum.	Mastoid Abscess.	Percentage on all cases injected with Antitoxic Serum.
Fountain	9	33·3	3	11·1	...	0·0	...	0·0	7	25·9	...	0·0	1	3·7	1	3·7	...	0·0	...	0·0	...	0·0	...	0·0
Western	2	2·7	7	9·5	...	0·0	1	1·3	12	16·4	4	5·4	4	5·4	...	0·0	1	1·3	3	4·1	3	4·1	...	0·0
Eastern	11	18·03	9	14·7	3	4·9	2	3·2	11	18·03	...	0·0	...	0·0	1	1·6	2	3·2	1	1·6	1	1·6	...	0·0
South-Eastern ...	45	50·5	10	11·2	...	0·0	...	0·0	1	1·1	1	1·1	1	1·1	...	0·0	1	1·1	1	1·1	3	3·3	1	1·1
South-Western ...	9	23·07	1	2·5	...	0·0	...	0·0	3	7·6	...	0·0	...	0·0	2	5·1	...	0·0	...	0·0	...	0·0	...	0·0
North-Western ...	14	33·3	...	0·0	2	4·7	1	2·3	5	11·9	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	2·3
Northern	2	50·0	...	0·0	...	0·0	...	0·0	...	0·0	1	25·0	1	25·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
Total	92	27·4	30	8·9	5	1·4	4	1·1	39	11·6	6	1·7	7	2·08	4	1·1	4	1·1	5	1·4	7	2·08	2	0·5

1896.

Hospitals.	Albuminuria.	Percentage on all cases injected with Antitoxic Serum.	Vomiting.	Percentage on all cases injected with Antitoxic Serum.	Anuria.	Percentage on all cases injected with Antitoxic Serum.	Urine Scanty.	Percentage on all cases injected with Antitoxic Serum.	Adenitis.	Percentage on all cases injected with Antitoxic Serum.	Nephritis.	Percentage on all cases injected with Antitoxic Serum.	Joint Pains.	Percentage on all cases injected with Antitoxic Serum.	Injection Abscess.	Percentage on all cases injected with Antitoxic Serum.	Pyrexia.	Percentage on all cases injected with Antitoxic Serum.	Otitis.	Percentage on all cases injected with Antitoxic Serum.	Cellulitis.	Percentage on all cases injected with Antitoxic Serum.	Tonsillar Abscess.	Percentage on all cases injected with Antitoxic Serum.
Fountain...	35	40·2	17	19·5	3	3·4	...	0·0	9	10·3	2	2·2	4	4·5	3	3·4	2	2·2	...	0·0	...	0·0	...	0·0
Western	11	15·9	14	20·2	...	0·0	1	1·4	8	11·5	...	0·0	1	1·4	...	0·0	4	5·7	9	13·04	2	2·8	1	1·4
Eastern	19	34·5	8	14·5	4	7·2	3	5·4	4	7·2	2	3·6	1	1·8	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
South-Eastern ...	39	46·4	19	22·6	...	0·0	2	2·3	2	2·3	...	0·0	2	2·3	1	1·1	...	0·0	2	2·3	...	0·0	...	0·0
South-Western ...	6	31·5	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	5·2	...	0·0	...	0·0	...	0·0	...	0·0
North-Western ...	16	38·09	4	9·5	3	7·1	2	4·7	16	38·09	...	0·0	1	2·3	...	0·0	...	0·0	1	2·3	...	0·0	...	0·0
North-Eastern ...	2	33·3	1	16·6	...	0·0	...	0·0	...	0·0	1	16·6	...	0·0	...	0·0	1	16·6	...	0·0	...	0·0	...	0·0
Brook	2	11·7	1	5·8	...	0·0	1	5·8	2	11·7	...	0·0	1	5·8	1	5·8	1	5·8	2	11·7	...	0·0	...	0·0
Northern	6	22·2	2	7·4	...	0·0	...	0·0	...	0·0	...	0·0	1	3·7	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
Gore Farm	2	18·1	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	9·09	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
Total	138	33·09	66	15·8	10	2·3	9	2·1	41	9·8	5	1·1	12	2·8	6	1·4	8	1·9	14	3·3	2	0·4	1	0·2

TABLE LXXVIII.—Showing Complications occurring in cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected. The second column under each heading gives the percentage of these cases on all cases not injected with antitoxic serum.

1895.

Hospitals.	Albuminuria.	Percentage on all cases not injected with Antitoxic Serum.	Vomiting.	Percentage on all cases not injected with Antitoxic Serum.	Anuria.	Percentage on all cases not injected with Antitoxic Serum.	Urine Scanty.	Percentage on all cases not injected with Antitoxic Serum.	Adenitis.	Percentage on all cases not injected with Antitoxic Serum.	Nephritis.	Percentage on all cases not injected with Antitoxic Serum.	Joint Pains.	Percentage on all cases not injected with Antitoxic Serum.	Cervical Abscess.	Percentage on all cases not injected with Antitoxic Serum.	Pyrexia.	Percentage on all cases not injected with Antitoxic Serum.	Otitis.	Percentage on all cases not injected with Antitoxic Serum.	Cellulitis.	Percentage on all cases not injected with Antitoxic Serum.	Mastoid Abscess.	Percentage on all cases not injected with Antitoxic Serum.	Abscess in Groin.	Percentage on all cases not injected with Antitoxic Serum.
Fountain...	27	12·5	8	3·7	1	0·4	...	0·0	25	11·5	7	3·2	...	0·0	...	0·0	2	0·9	1	0·4	...	0·0	...	0·0	...	0·0
Western	4	2·4	1	0·6	...	0·0	...	0·0	6	3·6	4	2·4	3	1·8	1	0·6	...	0·0	4	2·4	1	0·6	1	0·6	...	0·0
Eastern	25	9·5	10	3·8	4	1·5	...	0·0	15	5·7	7	2·6	1	0·3	4	1·5	1	0·3	1	0·3	...	0·0	...	0·0	...	0·0
South-Eastern	33	25·1	8	6·1	1	0·7	1	0·7	3	2·2	4	3·05	...	0·0	1	0·7	...	0·0	2	1·5	...	0·0	1	0·7	...	0·0
South-Western	4	5·2	...	0·0	...	0·0	...	0·0	1	1·3	...	0·0	...	0·0	...	0·0	1	1·3	...	0·0	...	0·0	...	0·0	...	0·0
North-Western	22	16·7	4	3·05	1	0·7	...	0·0	12	9·1	1	0·7	...	0·0	2	1·5	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
North-Eastern	29	29·2	2	2·02	...	0·0	...	0·0	10	10·1	10	10·1	...	0·0	1	1·01	...	0·0	4	4·04	...	0·0	..	0·0	1	1·01
Northern	4	6·8	10	17·2	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	1·7	...	0·0	1	1·7	...	0·0
Total	148	13·02	43	3·7	7	0·6	1	0·08	72	6·3	33	2·9	4	0·3	9	0·7	4	0·3	13	1·1	1	0·08	3	0·2	1	0·08

1896.

Hospitals.	Albuminuria.	Percentage on all cases not injected with Antitoxic Serum.	Vomiting.	Percentage on all cases not injected with Antitoxic Serum.	Anuria.	Percentage on all cases not injected with Antitoxic Serum.	Urine Scanty.	Percentage on all cases not injected with Antitoxic Serum.	Adenitis.	Percentage on all cases not injected with Antitoxic Serum.	Nephritis.	Percentage on all cases not injected with Antitoxic Serum.	Joint Pains.	Percentage on all cases not injected with Antitoxic Serum.	Cervical Abscess.	Percentage on all cases not injected with Antitoxic Serum.	Pyrexia.	Percentage on all cases not injected with Antitoxic Serum.	Otitis.	Percentage on all cases not injected with Antitoxic Serum.	Cellulitis.	Percentage on all cases not injected with Antitoxic Serum.	Mastoid Abscess.	Percentage on all cases not injected with Antitoxic Serum.	Abscess in Groin.	Percentage on all cases not injected with Antitoxic Serum.
Fountain...	47	17·4	11	4·07	...	0·0	...	0·0	19	7·03	2	0·7	2	0·7	2	0·7	6	2·2	...	0·0	...	0·0	1	0·3	...	0·0
Western	11	5·04	7	3·2	1	0·4	...	0·0	7	3·2	3	1·3	3	1·3	3	1·3	7	3·2	13	5·9	...	0·0	...	0·0	...	0·0
Eastern	28	10·4	16	5·9	1	0·3	2	0·7	6	2·2	8	2·9	4	1·4	4	1·4	...	0·0	4	1·4	...	0·0	3	1·1	...	0·0
South-Eastern	53	27·8	20	10·5	...	0·0	...	0·0	6	3·1	6	3·1	2	1·05	...	0·0	1	0·5	5	2·6	...	0·0	...	0·0	...	0·0
South-Western	12	10·4	3	2·6	...	0·0	...	0·0	1	0·8	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
North-Western	39	27·2	12	8·3	3	2·09	1	0·6	17	11·8	1	0·6	2	1·3	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
North-Eastern	15	27·2	3	5·4	...	0·0	...	0·0	3	5·4	2	3·6	...	0·0	1	1·8	1	1·8	4	7·2	...	0·0	...	0·0	...	0·0
Brook	4	10·8	1	2·7	...	0·0	...	0·0	2	5·4	...	0·0	1	2·7	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0
Northern	3	7·3	3	7·3	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	2·4	...	0·0	...	0·0	...	0·0
Gore Farm	1	11·1	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	11·1	...	0·0	...	0·0	...	0·0	...	0·0
Total	213	15·8	76	5·6	5	0·3	3	0·2	61	4·5	22	1·6	14	1·03	10	0·7	16	1·1	27	2·004	...	0·0	4	0·2	...	0·0

Moribund cases. TABLE LXXIX.—Showing Moribund cases which died within 48 hours of admission to Hospital, in which no Diphtheria bacilli were found but in which Antitoxic Serum was injected. In the second column under each heading is given the percentage proportion of these cases to those injected with antitoxic serum.

1895.

Ages.	Under 1.		1 to 2.		2 to 3.		3 to 4.		4 to 5.		5 to 10.		10 to 15.		15 to 20.		20 and upwards.		Total.	
Hospitals.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.
Fountain	1	100·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	3·7
Western	...	0·0	...	0·0	1	8·3	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	1·3
Eastern	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	9·09	...	0·0	...	0·0	1	1·6
South-Western	1	25·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	2·5
North-Western	...	0·0	...	0·0	...	0·0	2	25·0	...	0·0	...	0·0	...	0·0	1	100·0	...	0·0	3	7·1
Total	2	16·6	...	0·0	1	3·03	2	4·5	...	0·0	...	0·0	1	2·04	1	7·1	...	0·0	7	2·08

1896.

Hospitals.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.	Cases.	Percentage on all injected cases.
Fountain	...	0·0	1	14·2	...	0·0	1	9·09	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	2	2·2
Western	...	0·0	...	0·0	...	0·0	1	16·6	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	1·4
South-Western	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	20·0	...	0·0	...	0·0	1	5·2
Total	...	0·0	1	2·8	...	0·0	2	4·1	...	0·0	...	0·0	1	1·9	...	0·0	...	0·0	4	0·9

TABLE LXXX.—Showing Moribund cases which died within 48 hours of admission to Hospital, in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected. In the second column under each heading is given the percentage proportion of these cases to those in which no antitoxic serum was injected.

1895.

Ages.	Under 1.		1 to 2.		2 to 3.		3 to 4.		4 to 5.		5 to 10.		10 to 15.		15 to 20.		20 and upwards.		Total.	
Hospitals.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.
Fountain	1	50·0	1	12·5	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	2·7	3	1·3
Western	...	0·0	...	0·0	...	0·0	1	9·09	...	0·0	1	2·7	...	0·0	...	0·0	...	0·0	2	1·2
Eastern	...	0·0	1	10·0	1	7·6	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	2	0·7
South-Eastern	...	0·0	...	0·0	1	20·0	...	0·0	...	0·0	2	5·5	1	4·1	...	0·0	...	0·0	4	3·05
North-Western	2	50·0	...	0·0	...	0·0	...	0·0	...	0·0	2	6·06	...	0·0	...	0·0	...	0·0	4	3·05
North-Eastern	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	3·1	...	0·0	...	0·0	...	0·0	1	1·01
Total	3	17·6	2	5·2	2	3·7	1	1·1	...	0·0	6	1·8	1	0·4	...	0·0	1	0·4	16	1·4

1896.

Hospitals.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.	Cases.	Percentage on all cases not injected.
Fountain	...	0·0	...	0·0	1	7·1	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	0·3
Western	...	0·0	1	20·0	...	0·0	1	7·1	...	0·0	1	1·9	...	0·0	...	0·0	2	3·7	5	2·2
Eastern	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	2·04	...	0·0	...	0·0	1	0·3
South-Eastern	...	0·0	...	0·0	...	0·0	...	0·0	2	13·3	...	0·0	...	0·0	...	0·0	...	0·0	2	1·05
North-Western	...	0·0	1	16·6	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	1	0·6
Total	...	0·0	2	5·0	1	1·4	1	0·9	2	1·6	1	0·2	1	0·4	...	0·0	2	0·8	10	0·7

PARALYSES IN CASES IN WHICH NO DIPHTHERIA BACILLI WERE FOUND.

Coming now to the "paralyses," in those cases in which no diphtheria bacilli were found, we find that in 1895 (Tables LXXXI., LXXXII., and LXXXIII.) there were altogether 94 cases, of which only 44 were injected. Of those injected 11 died, and of the others 12. There was general or mixed paralysis in 12 of these cases; in 4 the vagus was affected, but of these 3 recovered, 2 being injected with antitoxin, the other not; in 29 cases there was ocular paralysis of some form or other, and palatal paralysis in 65. Of the occurrence of this condition at different ages, all that can be gathered is that the larger proportion of these paralyses seem to occur between 2 and 15 years of age, but that they are by no means confined to this period; in fact, in proportion to the number of cases, patients over 20 years of age appear to suffer from paralysis rather more frequently than at any other age. In 1896 the number of paralyses is considerably greater, especially amongst the cases that recovered, and amongst those dying at the later stages of the disease. This is exactly what might have been anticipated. It was expected that where antitoxin was given a certain proportion of the cases would be kept alive for longer periods, even where recovery was not complete; whilst amongst those in whom recovery was slow—that is, in the very severe cases—the effects of the poison that had been determined before the patient was brought under treatment could not be obliterated, but must remain and be manifested in paralytic symptoms.

Antitoxin and post-diphtherial paralyses.

Table LXXXI.—Showing Nature and Number of Paralyses (at different ages) found in cases in which no Diphtheria bacilli were found but which were injected with Antitoxic Serum. These figures deal with cases that recovered.

1895.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Total.	Days from and to.
Under 1... ...	...	1	...	...	...	1	72
1 to 2... ...	...	2	...	...	...	2	54 and 80
2 ,, 3... ...	...	2	...	2	...	4	70 to 95
3 ,, 4... ...	2	1	1	1	...	5	34 ,, 101
4 ,, 5... ...	1	...	...	...	1	2	93 and 102
5 ,, 10... ...	3	5	...	...	2	10	15 to 93
10 ,, 15... ...	3	1	1	1	1	7	37 ,, 108
15 ,, 20... ...	...	1	...	...	...	1	72
20 and upwards	1	...	...	...	...	1	25
Total ...	10	13	2	4	4	33	...

1896.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Days from and to.
Under 1... ...	1	1	...	...	...	...	...	...	...	2	22 and 62
1 to 2... ...	1	3	...	...	1	...	...	...	...	5	25 to 107
2 ,, 3... ...	4	1	1	...	...	...	...	...	1	7	35 ,, 162
3 ,, 4... ...	3	3	1	1	...	...	...	...	...	8	31 ,, 121
4 ,, 5... ...	2	4	1	...	1	...	...	...	...	8	32 ,, 230
5 ,, 10... ...	3	5	2	...	2	...	1	1	...	14	44 ,, 125
10 ,, 15... ...	1	2	1	...	3	2	...	...	...	9	48 ,, 115
15 ,, 20... ...	...	1	...	...	...	...	...	...	...	1	78
20 and upwards	...	2	...	...	1	1	...	...	...	4	22 to 162
Total ...	15	22	6	1	8	3	1	1	1	58	...

Table LXXXII.—Showing Nature and Number of Paralyses (at different ages) found in cases in which no Diphtheria bacilli were found but which were injected with Antitoxic Serum. These figures deal with cases that died.

1895.

Ages.	Ocular.	Palate.	Vagus.	Ocular and Palate.	Mixed.	Total.	Days from and to.
Under 1	1	1	...	...	...	2	5 and 16
1 to 2	...	2	...	...	...	2	8 ,, 38
2 ,, 3	...	...	...	1	...	1	35
3 ,, 4	...	...	...	...	...	...	...
4 ,, 5	...	1	...	...	...	1	5
5 ,, 10	...	1	1	...	...	2	5 and 10
10 ,, 15	...	1	...	1	...	2	6 ,, 7
15 ,, 20	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	1	1	25
Total	1	6	1	2	1	11	...

1896.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Ocular and General.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Days from and to.
Under 1	1	1	...	...	...	...	...	...	...	2	3 and 48
1 to 2...	...	3	...	...	...	...	...	...	...	3	3 to 17
2 ,, 3...	...	3	1	...	...	1	...	1	...	6	4 ,, 85
3 ,, 4...	...	3	1	1	1	...	...	...	...	6	4 ,, 18
4 ,, 5...	1	1	...	...	...	...	...	...	1	3	5 ,, 38
5 ,, 10...	1	5	...	...	...	...	1	...	...	7	4 ,, 71
10 ,, 15...	...	1	...	...	...	...	1	...	...	2	11 and 14
15 ,, 20...	...	1	...	...	...	...	...	...	...	1	22
20 and upwards	...	1	...	...	...	...	...	...	...	1	5
Total	3	19	2	1	1	1	2	1	1	31	

TABLE LXXXIII.—Showing Nature and Number of Paralyses (at different ages) found in cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

These figures deal with cases that recovered. These figures deal with cases that died.

1895.									1895.					
Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Total.	Days from and to.	Ages.	Ocular.	Palate.	General	Total.	Days from and to.
Under 1 ...	...	...	...	...	...	...	...	...	Under 1 ..	...	...	...	...	...
1 to 2 ...	...	2	...	...	...	...	2	7 and 50	1 to 2 ..	...	...	...	...	...
2 „ 3 ...	...	...	...	...	...	...	...	...	2 „ 3 ..	...	1	...	1	13
3 „ 4 ...	...	2	...	...	1	1	4	60 to 157	3 „ 4 ...	1	1	1	3	2 to 11
4 „ 5 ...	2	4	...	1	...	1	8	9 „ 152	4 „ 5 ...	1	1	...	2	9 and 44
5 „ 10 ..	...	9	...	1	2	1	13	25 „ 213	5 „ 10 ...	...	3	...	3	2 to 9
10 „ 15 ...	1	2	1	...	...	1	5	42 „ 157	10 „ 15 ...	...	...	...	...	...
15 „ 20 ...	...	2	...	...	...	...	2	33 and 50	15 „ 20 ...	...	1	1	2	4 and 5
20 and upwards	...	4	...	...	...	...	4	14 to 83	20 and upwards	...	1	...	1	8
Total ...	3	25	1	2	3	4	38	...	Total ...	2	8	2	12	...

These figures deal with cases that recovered. These figures deal with cases that died.

1896.												1896.								
Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular and General.	Palate and Vagus.	Total.	Days from and to.	Ocular.	Palate.	Vagus.	General.	Ocular and General.	Palate and Vagus.	Ocular and Vagus.	Total.	Days from and to.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	1	1	8
1 to 2	...	...	...	...	...	...	...	...	...	...	...	1	3	1	...	...	...	...	5	6 to 17
2 „ 3	2	4	...	1	...	...	1	...	1	9	58 to 162	1	2	1	1	1	...	...	6	4 „ 75
3 „ 4	2	5	...	1	...	...	...	...	1	9	38 „ 180	1	2	...	...	...	...	...	3	14 „ 70
4 „ 5	1	3	1	...	...	...	1	...	...	6	23 „ 84	1	...	...	1	...	1	1	4	35 „ 92
5 „ 10	3	8	1	...	...	1	...	...	1	14	25 „ 120	2	1	2	...	...	...	...	5	6 „ 25
10 „ 15	3	4	...	...	1	...	...	...	...	8	15 „ 99	1	...	1	...	...	...	...	2	4 & 5
15 „ 20	...	2	...	...	...	...	...	...	...	2	15 and 51	...	...	...	...	...	...	...	...	...
20 and upwards ...	2	7	1	...	1	...	...	1	...	12	6 to 94	...	...	2	...	...	...	...	2	2 & 85
Total	13	33	3	2	2	1	2	1	3	60	...	7	8	7	2	1	1	2	28	...

It will be noted that in cases not injected with antitoxin we have a considerable number of paralyses noted, even in cases in which no diphtheria bacilli could be demonstrated in the throat of the patient. Thus we find that amongst those injected with antitoxin there were 89 cases in which paralysis occurred: 31 of these died; whilst of those not injected with antitoxin there were 88 cases in which paralysis was developed; of these 28 died. It is evident, therefore, from a consideration of the cases as reported, that one reason for the apparent increase in the number of paralyses must be that a more careful look-out was kept for comparatively slight indications of paralysis, this being especially marked in connection with the ocular and palatal paralyses, although a similar remark applies to paralyses of the vagus; for instance, we find in this year that there were no fewer than 57 cases in which ocular paralysis was noted, 105 in which the palate was found to be affected, and 28 in which the vagus was affected, although of the vagus cases only 15 proved fatal—a very much smaller proportion than in other records. It must, therefore, be argued from all this that a more careful search was made for paralysis of various forms, and that much slighter evidence of nerve or muscle change is now accepted and recorded as evidence of paralysis than was formerly the case. It remains to be seen whether there will be any further rise in this type of case, or whether the antitoxic treatment, when carried out at the early stage of the disease, will so far prevent the occurrence of these paralyses that there will be an actual fall in the number, in spite of the fact that a certain proportion of cases treated in the later stages of disease will recover, and must, later, show paralytic symptoms of various kinds. At present any statistics that we have are very imperfect, but I must draw attention to the great necessity there is for recording the exact nature of the paralysis and the exact evidence on which the diagnosis is based, in order that further information concerning the course and history of the diphtheritic process may be obtained.

Ocular paralysis.

Paralysis of vagus.

TABLE LXXXIV.—Showing Nature and Number of Rashes found in cases in which no Diphtheria bacilli were found but which were treated with Antitoxic Serum. The figures in the third and fourth columns refer to the lowest and highest number of days on which the rash appeared after the injection of the antitoxic serum, not counting day of injection.

Hospitals.	Urticaria.				Erythema.				Papular.				Macular Erythema.				Punctiform Erythema.			
	Cases.	Percentage on total cases injected.	Days from and to.		Cases.	Percentage on total cases injected.	Days from and to.		Cases.	Percentage on total cases injected.	Days from and to.		Cases.	Percentage on total cases injected.	Days from and to.		Cases.	Percentage on total cases injected.	Days from and to.	
1895.																				
Fountain	7	25·9	7	17	...	...	...	...	...	...	...	...	...	...	...	...	1	3·7	3	...
Western	16	21·9	oa	16	6	8·2	oa	13	1	1·3	9	...	6	8·2	7	15	...	...	...	...
Eastern	9	14·7	oa	17	10	16·3	1	10	1	1·6	12	...	...	...	...	...	1	1·6	3	...
South-Eastern ...	30	33·7	4	27	13	14·6	2	23	...	...	...	...	2	2·2	3	15	1	1·1	2	...
South-Western ...	17	43·5	4	17	...	...	...	...	...	...	...	...	...	...	...	...	1	2·5	2	...
North-Western ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	79	23·5	...	...	29	8·6	...	...	2	0·5	...	...	8	2·3	...	...	4	1·1	...	...
1896.																				
Fountain	9	10·3	7	20	5	5·7	oa	17	5	5·7	oa	13	1	1·1	8	...	5	5·7	oa	12
Western	17	24·6	2	21	7	10·1	7	10	2	2·8	oa	11	5	7·2	3	to 14	12	17·3	2	22
Eastern	1	1·8	8	...	15	27·2	6	15	2	3·6	2	10	...	...	...	...	8	14·5	2	16
South-Eastern ...	12	14·2	2	13	17	20·2	1	20	7	8·3	4	23	4	4·7	2	19	9	10·7	oa	24
South-Western ...	5	26·3	7	13	1	5·2	3	...	...	...	...	...	...	...	...	...	2	10·5	2	10
North-Western ...	4	9·5	7	18	2	4·7	12	20	...	...	...	...	...	...	...	...	2	4·7	2	7
North-Eastern ...	2	33·3	2	15	1	16·6	8	...	...	...	...	...	...	...	...	...	...	...	...	...
Brook	1	5·8	10	...	6	35·2	oa	35	...	...	...	...	...	...	...	...	1	5·8	3	..
Northern	9	33·3	4	13	...	...	...	...	1	3·7	4	...	...	...	...	...	...	...	...	...
Gore Farm	1	9·09	13	...	3	27·2	5	12	...	...	...	...	...	...	...	...	...	...	...	...
Total	61	14·6	...	...	57	13·6	...	...	17	4·07	...	...	10	2·3	...	...	39	9·3	...	...

Hospitals.	Blotchy Rash.				Antitoxin Rash.				Rash.				Scarlet Fever Rash.				Septic Rash.				Total.	
	Cases.	Percentage on total cases injected.	Days from and to.		Cases.	Percentage on total cases injected.	Days from and to.		Cases.	Percentage on total cases injected.	Days from and to.		Cases.	Percentage on total cases injected.	Days from and to.		Cases.	Percentage on total cases injected.	Days from and to.		Cases.	Percentage on total cases injected.
1895.																						
Fountain	1	3·7	10	...	1	3·7	21	...	...	...	...	...	...	...	...	...	...	...	...	...	10	37·03
Western	1	1·3	8	...	...	...	...	...	2	2·7	10	13	...	...	...	...	...	...	...	...	32	43·8
Eastern	...	...	...	...	6	9·8	7	15	1	1·6	19	...	...	...	...	...	...	...	...	...	28	45·9
South-Eastern ...	2	2·2	4	9	...	...	...	...	5	5·6	2	17	...	...	...	...	...	...	...	...	53	59·5
South-Western ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	46·1
North-Western ...	...	...	...	...	1	2·3	10	...	1	2·3	10	...	2	4·7	3	5	...	...	...	...	4	9·5
Total	4	1·1	...	...	8	2·3	...	...	9	2·6	...	...	2	0·5	...	.	...	...	...	...	145	43·2
1896.																						
Fountain	3	3·4	2	to 11	9	10·3	3	to 14	5	5·7	6	to 15	5	5·7	oa	19	1	1·1	7	...	48	55·1
Western	1	1·4	5	...	...	...	...	...	...	...	...	...	1	1·4	oa	...	...	...	...	...	45	65·2
Eastern	...	...	...	...	2	3·6	9	16	...	...	...	...	3	5·4	2	10	...	...	...	...	31	56·3
South-Eastern ...	...	...	...	...	...	...	...	...	1	1·1	13	...	4	4·7	2	56	...	...	...	...	54	64·2
South-Western ...	...	...	...	...	...	...	...	...	...	...	...	...	1	5·2	19	...	...	...	...	...	9	47·3
North-Western ...	...	...	...	...	...	...	...	...	...	...	...	...	2	4·7	4	5	...	...	...	...	10	23·8
North-Eastern ...	...	...	...	...	...	...	...	...	2	33·3	oa	...	...	...	...	...	...	...	...	...	5	83·3
Brook	...	...	...	...	1	5·8	10	...	...	...	...	...	...	...	...	...	...	...	...	...	9	52·9
Northern	...	...	...	...	1	3·7	10	...	2	7·4	1	8	...	...	...	...	...	...	...	...	13	48·1
Gore Farm	...	...	...	...	...	...	...	...	1	9·09	3	...	...	...	...	...	...	...	...	...	5	45·4
Total	4	0·09	...	...	13	3·1	...	...	11	2·6	...	...	16	3·8	...	...	1	0·02	...	...	229	54·9

NOTE.—Read oa = on admission to hospital.

TABLE LXXXV.—Showing Nature and Number of Rashes found in cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected. The figures in the third columns refer to the lowest and highest number of days in which rash appeared after the onset of disease.

1895.

pital	Urticaria.			Erythema.			Papular.			Macular Erythema.			Punctiform Erythema.			Blotchy Rash.			Rash.			Scarlet Fever Rash.			Total Rashes.	
	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.
Fountain	1	0·4	?	4	1·8	1 oa, 2 ?, & 12	...	0·0	...	...	0·0	...	9	4·1	?	...	...	...	10	4·6	2 ? & 8 2 to 14	3	1·3	1 oa, 1 ?, & 1·2	27	12·5
Western	1	0·6	10	3	1·8	11 to 19	...	0·0	...	1	0·6	15	2	1·2	4 & 10	...	...	...	2	1·2	7 & 12	1	0·6	10	10	6·09
Eastern	...	0·0	...	11	4 2	?	3	1·1	2 ? & 1 2	2	0·7	2 ?	14	5·3	?	...	...	...	4	1·5	?	4	1·5	?	38	14·5
South-Eastern	...	0·0	...	2	1·5	oa	1	0·7	oa	...	0·0	...	4	3·05	3 & 4	...	...	...	1	0·7	?	10	7·6	9 oa & 1 2	18	13·7
North-Western	2	1·5	1 ? & 1 25	...	0·0	...	...	0·0	...	1	0·7	?	...	0·0	...	...	...	...	4	3·05	1 ? & 3 3 to 23	4	3·05	3 ? & 1 12	11	8·3
Northern	1	1·7	?	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	...	...	...	...	...	5	8·6	4 ? & 1·4	6	10·3
Total	5	0·4	...	20	1·7	...	4	0·3	...	4	0·3	...	29	2·5	...	...	...	...	21	1·8	...	27	2·3	...	110	9·6

1896.

pital	Urticaria.			Erythema.			Papular.			Macular Erythema.			Punctiform Erythema.			Blotchy Rash.			Rash.			Scarlet Fever Rash.			Total Rashes.	
	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.	Days from and to.	Cases.	Percentage on total cases not injected.
Fountain	3	1·1	1 oa, 1 10, & 1 20	6	2·2	5 oa & 1 4	10	3·7	5 to 25	1	0·3	oa	13	4·8	12 oa & 1·33	...	0·0	...	22	8·1	3 to 29	42	15·5	39 oa, 1 ?, & 2·3	97	35·9
Western	...	0·0	...	4	1·8	3 ? & 1 12	5	2·2	3 ? 1 oa & 1 4	3	1·3	2 ? & 1 5	15	6·8	11 to 30	1	0·4	7	5	2·2	3 ? & 2 1	9	4·1	7 to 42	42	19·2
Eastern	...	0·0	...	14	5·2	2 to 8	2	0·7	1 ? & 1 oa	...	0·0	...	33	12·2	1 to 11	...	0·0	...	6	2·2	11 to 42	26	9·6	22 ?, 3 oa, & 1 24	81	30·1
South-Eastern	3	1·5	12 to 29	8	4·2	5 to 26	5	2·6	5 to 56	4	2·1	13 to 15	15	7·8	1 to 13	1	0·5	6	4	2·1	5 to 8	32	16·8	2 to 57	72	37·8
South-Western	2	1·7	?	4	3·4	18 to 27	...	0·0	...	...	0·0	...	7	6·08	17 to 39	1	0·8	9	1	0·8	23	1	0·8	11	16	13·9
North-Western	4	2·7	3 to 17	3	2·09	7 to 14	1	0·6	?	...	0·0	...	1	0·6	6	...	0·0	...	8	5·5	2 to 7	3	2·09	2 ? & 1 2	20	13·9
North-Eastern	1	1·8	60	1	1·8	29	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	26	47·2	25 oa & 1 33	...	0·0	...	28	50·9
Brook	...	0·0	...	5	13·5	4 ? & 1 oa	1	2·7	9	...	0·0	...	5	13·5	4 ? & 1 3	...	0·0	...	...	0·0	...	1	2·7	?	12	32·4
Northern	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	1	2·4	?	1	2·4
Gore Farm	...	0·0	...	1	11·1	?	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	1	11·1
Total	13	0·9	...	46	3·4	...	24	1·7	...	8	0·5	...	89	6·6	...	3	0·2	...	72	5·3	...	115	8·5	...	370	27·4

NOTE.—Read oa = on admission to Hospital.

Cases in which Relapse Occurred.

Amongst the cases in which no diphtheria bacilli were found the number of relapses is exceedingly small, there being only one in each year, neither of them proving fatal, but responding readily to an additional dose of antitoxin.

Cases of Hæmorrhagic Diphtheria.

As regards the hæmorrhagic cases in which no diphtheria bacilli were found, one occurred in 1895 in a patient over 20 years of age. This patient was not injected with antitoxin, but recovered. In 1896 there were five such hæmorrhagic cases—one between 3 and 4 years of age, one between 4 and 5 years, two between 5 and 10 years, and one between 10 and 15 years. All of these were injected, and all died; they may, undoubtedly, be put down as cases of true hæmorrhagic diphtheria. Another case in which no bacilli were found was looked upon as not being diphtheritic in character. It occurred in a patient between 5 and 10 years of age. No antitoxin was injected, as the case was diagnosed as being non-diphtheritic.

Rashes.

Antitoxin and non-antitoxin rashes.

Amongst the cases injected with antitoxin, in both 1895 and 1896 (Table LXXXIV.) the urticarial rashes are by far the most important, as they occurred in 23·5 per cent. of the cases in 1895 and 14·6 in 1896. The various forms of erythema were comparatively few in number in 1895—only 41 out of the whole series—but in 1896 they rise to 106, as against 61 urticarial rashes; whilst where no antitoxin is given in these two years (Table LXXXV.) we have only 5 urticarial rashes in 1895 and 13 in 1896; the erythematous rashes for the same period number 53 for 1895 and 143 for 1896 respectively. All those rashes which are simply marked "rash" or "scarlet fever rash" are here left out of account. It should be noted that "antitoxin rash" is described as being present in only 8 cases in 1895 and in 13 cases in 1896; but the nature of this antitoxin rash, which is placed in a special column, is not stated. It will be noted, however, that in 1895 there is a percentage of rashes amongst the injected cases equal to 43·2 and in 1896 equal to 54·9, whilst amongst the non-injected cases the percentages were 9·6 in 1895 and 27·4 in 1896. Part of this enormous increase in the non-injected cases, however, is due to the fact that in 1896 there were 115 cases of scarlet fever rash, as against 27 cases in 1895. It is, nevertheless, an exceedingly interesting fact, and one that should be noted, that we have a much larger proportion of urticarial rashes amongst the antitoxin cases, but a larger proportion of erythematous rashes in the non-antitoxin cases. It will be observed that in 1896 the proportion of erythematous rashes, even in those cases injected with antitoxin, is more marked than in 1895; but we have a corresponding increase in the number of erythematous rashes in cases not treated with antitoxin at all, from which it will be gathered that the urticarial rash, in all probability, must, to a very large extent at any rate, be the result of the injection of antitoxin, which, without necessarily increasing the number of rashes in severe cases, appears to modify the type from a mere erythema—the form that is met with in the non-injected cases—to an urticaria—the form usually met with in the injected cases.

Scarlet fever rashes.

Pneumonia.

Amongst the bacteriologically negative cases in 1895, bronchitis or pneumonia, in one of its various forms, developed in 38 cases, which were so far diphtheritic in character that they were injected with antitoxin (Table LXXXVI.), 25 of these cases being in children under 3 years

Table LXXXVI.—Showing Pneumonic complications, with percentage Mortality, in cases in which no Diphtheria bacilli were found but in which Antitoxic Serum was injected.

1895.

Ages.	Lobar Pneumonia.		Pneumonia (form not stated).		Septic Pneumonia.		Apical Pneumonia.		Broncho-Pneumonia.		Bronchitis.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 ...	1	1	1	1	...	...	...	...	...	...	3	3	5	5
1 to 2 ...	1	1	2	2	...	...	...	...	5	4	4	3	12	10
2 ,, 3 ...	1	...	1	1	1	1	...	...	4	2	1	...	8	4
3 ,, 4 ...	1	...	...	...	...	...	...	...	5	5	...	...	6	5
4 ,, 5 ...	...	...	...	...	...	...	...	...	3	3	...	...	3	3
5 ,, 10 ...	...	...	...	...	...	...	1	...	...	...	1	1	2	1
10 ,, 15 ...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
15 ,, 20 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 & upwards	...	...	1	1	...	...	...	...	...	...	...	...	1	1
Total... ...	4	2	5	5	1	1	1	...	17	14	10	7	38	29
Mortality per cent.	50·0		100·0		100·0		0·0		82·3		70·0		76·3	

1896.

Ages.	Lobar Pneumonia.		Pneumonia (form not stated).		Double Pneumonia.		Broncho-Pneumonia.		Bronchitis		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 ...	...	...	1	1	1	1	1	1	...	...	3	3
1 to 2 ...	...	...	1	...	...	...	2	2	2	2	5	4
2 ,, 3 ...	1	...	2	2	1	1	2	2	3	1	9	6
3 ,, 4 ...	...	...	1	1	...	...	1	1	2	1	4	3
4 ,, 5 ...	...	...	...	...	...	...	2	2	...	...	2	2
5 ,, 10 ...	1	...	1	...	...	...	3	1	2	...	7	1
10 ,, 15 ...	1	...	...	...	...	...	...	...	1	...	2	...
15 ,, 20 ...	...	...	...	...	...	...	...	...	...	...	...	...
20 & upwards	...	...	...	...	...	...	...	...	...	...	...	...
Total... ...	3	...	6	4	2	2	11	9	10	4	32	19
Mortality per cent.	0·0		66·6		100·0		81·8		40·0		59·3	

Pneumonia and bronchitis.

of age. Of the whole group 29 died, whilst of those under 3 years of age 19 died. In the similar cases not injected (Table LXXXVII.) there were 62 cases of pneumonia; nearly eight-ninths of these occurring between 2 and 10 years of age. Of the whole of these cases 29 proved fatal, and of the group under 10 years of age 28 died. In 1896 there were 32 cases (with 19 deaths) of pneumonia and bronchitis amongst those injected with antitoxin, and 71 amongst those not injected (26 deaths); the majority of the cases, in both these sets, again occur between the ages of 2 and 10. Amongst the injected cases the mortality fell from 76·3 in 1895 to 59·3 in 1896, whilst the mortality amongst the cases not treated with antitoxin fell from 46·7 in 1895 to 36·6 in 1896. For purposes of classification these injected cases should probably be placed along with true diphtheritic cases, as the clinical symptoms were so characteristic that the physician in charge thought it necessary to inject antitoxin. Those in which no antitoxin was given and in which no diphtheria bacilli were found, in all probability, had little clinical resemblance to diphtheria, and the bacteriological evidence being negative, we must assume that we are here dealing with pneumonias the result of the action of other forms of specific infective poison.

TABLE LXXXVII.—Showing Pneumonic complications, with percentage Mortality, in cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

1895.

Ages.	Lobar Pneumonia.		Pneumonia (form not stated).		Septic Pneumonia.		Broncho-Pneumonia.		Bronchitis.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 ...	...	...	...	...	...	...	2	2	1	...	3	2
1 to 2 ...	...	...	1	1	...	...	3	2	3	2	7	5
2 ,, 3 ...	...	...	2	1	...	...	4	3	4	2	10	6
3 ,, 4 ...	...	...	...	...	...	...	9	4	5	1	14	5
4 ,, 5 ...	...	...	1	1	1	1	4	2	1	...	7	4
5 ,, 10 ...	3	...	3	2	1	1	5	2	2	1	14	6
10 ,, 15 ...	...	...	1	...	...	...	...	...	1	...	2	...
15 ,, 20 ...	...	...	1	1	...	...	...	...	1	...	2	1
20 & upwards	1	...	1	...	...	...	...	...	1	...	3	...
Total ...	4	...	10	6	2	2	27	15	19	6	62	29
Mortality per cent.	0·0		60·0		100·0		55·5		31·5		46·7	

1896.

Ages.	Lobar Pneumonia.		Pneumonia (form not stated).		Acute Pneumonia.		Apical Pneumonia.		Broncho-Pneumonia.		Bronchitis.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 ...	...	...	...	...	...	...	...	...	5	4	...	...	5	4
1 to 2 ...	...	...	...	...	1	1	...	...	4	3	5	...	10	4
2 ,, 3 ...	...	...	...	...	...	...	...	...	7	5	1	1	8	6
3 ,, 4 ...	...	...	...	...	...	...	1	...	3	2	2	...	6	2
4 ,, 5 ...	...	...	1	...	...	...	...	...	8	3	2	...	11	3
5 ,, 10 ...	1	...	1	1	...	...	...	...	11	3	8	2	21	6
10 ,, 15 ...	3	...	1	...	...	...	...	...	...	...	1	1	5	1
15 ,, 20 ...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
20 & upwards	...	...	...	...	...	...	...	...	...	...	4	...	4	...
Total ...	4	...	3	1	1	1	1	...	38	20	24	4	71	26
Mortality per cent.	0·0		33·3		100·0		0·0		52·6		16·6		36·6	

CLINICAL CASE.

General Data.				Special Data.			Local Symptoms.							Complicating Conditions.						Treatment.						Time Data.			Further Complication or Cause of Death.		Remarks.
Number of Specimen.	Reference No.	Sex.	Age.	Final Clinical Diagnosis.	Day of Disease on Admission.	Type of Disease.	Membrane.	Exudation.	Larynx.	One or both Tonsils.	Uvula.	Foetor.	Rhinorrhœa.	Vomiting.	Albuminuria.	Anuria.	Tracheotomy.	Croup.	Paralysis.	Liq. Chlorl.	Methylene Blue.	Boracic Lotion.	Pot. Chlor.	Iron.	Antitoxin.	Days of Treatment before Membrane Cleared	Time of Persistence of D.B.	Days in Hospital.	Respiratory.	Cardiac.	
+12,210	...	F.	2	D.	2	F. & N.	× (5)	×	...	× Ulcer (13)	...	...	...	× (24)	× (7)	...	...	...	Soft Palate (5)	...	...	...	5th 5th 7th 8th	- - - -	4,000 4,000 1,500 1,500	No. -60 -60 -57 -57	...	25 D	...	Trembling	Desquamation neck; Nasal fed (10); A.T. Erythema (15).
+12,677	...	F.	3	Sc. F.&D.	2	F.	...	×	...	×	×	...	...	...	...	...	...	...	Palate (3)	...	...	...	No A.	T.		...	...	6 D	...	...	Scarlet Fever Rash on admission; Diarrhœa (4).
+12,993	...	M.	6	D.	3	F. & N.	...	...	...	×	...	×	× (5)	× (8)	× (5)	×	...	...	...	...	...	...	3rd 3rd 5th	- - -	4,000 4,000 4,000	No. -60 -60 -60	...	9 D	...	...	Epistaxis (6); Urine scanty (6); No Urine 48 hours (11).
+ 9,810 +12,987	...	F.	3	D.	4	F.	×	× (15)	...	×	...	...	...	...	× (9)	...	...	...	Ocular (70)	...	...	...	5th 5th 5th 15th 15th	- - - - -	4,000 1,000 1,000 1,000 1,000	No. -60 -64 -64 -64 -64	...	75	...	...	A.T. Rash (8); Erythema (12).
+11,251 +13,217	...	F.	10	D.	3	F.	×	...	...	×	...	...	...	...	× (14)	...	...	...	...	...	...	...	3rd 3rd	- -	1,000 1,000	No. -45 -69	...	46	...	...	A.T. Rash, well-marked (12).
− 7,227 − 7,593 +13,270	...	F.	18 months	D.	4	F. & L	...	×	...	× ×	...	...	...	...	× (62)	Partial (7)	...	× (5)	Nasal fed (9)	...	...	...	4th 4th 4th 6th	- - - -	4,000 4,000 4,000 4,000	No. -56 -56 -56 -56	...	129	...	...	Anorexia (9); A.T. Rash (8); Lobar Pneumonia (50); Ulcerated Stomatitis (22); extremely emaciated (67); weight, 16 lbs. (99).
+ 9,010 −13,205	...	F.	5	D.	8	F.	×	...	...	×	...	...	...	...	× (20)	...	...	...	Nasal fed (36)	...	...	...	8th	-	4,000	No. -51 & 59	68	89	...	...	A.T. Rash (12); Apathetic (26); Regurgitation fluids (44); Abductor Paralysis (54); No Knee jerks (59).
+11,056 +12,865 −13,410	...	M.	8	D.	5	F. & L.	×	...	...	×	...	×	...	...	× (6)	...	×	...	Soft Palate	...	...	...	5th 5th 9th	- - -	4,000 4,000 4,000	No. -60 -60 -60	51	54	...	...	No Knee jerks (18); Regurgitation (48).
+11,397 −13,414	...	M.	7	D.	3	F.	...	..	...	×	...	...	...	...	...	...	...	...	...	...	...	...	No A.	T.		44	...	47	...	...	...
+ 7,928 +12,101 +13,026 +13,412	...	M.	9	D.	7	F.	×	...	...	×	...	...	...	...	× (12)	...	...	...	Palate Nasal Voice (29)	...	...	...	9th 9th	- -	5,000 2,000	No. -? -?	...	116	...	...	Endocarditis; Pupils react to light (47).

USE OF ANTITOXIN IN DIPHTHERIA—EFFECT OF DOSAGE ON PERCENTAGE MORTALITY.

In order to obtain some information as to the relative proportion of antitoxin given in the various hospitals, and to compare the average amount given with the percentage mortality, the following tables have been compiled (Tables LXXXVIII. to CI.).

Cases injected in 1894.

In 1894 (Table LXXXVIII.) the cases treated with antitoxin were few in number, and these were treated with serum from different sources, though I am informed that the bulk of it was obtained from the British Institute of Preventive Medicine. Only those cases in which diphtheria bacilli were found by us are here recorded. The mortality amongst these cases, which were all admitted in the year 1894 but were reported upon in 1895, was 8·3 per cent. This can scarcely be taken as an average series of cases. Some of them had been injected before cultures were sent for examination; others could be sent because they had remained alive for a considerable period, although diphtheria bacilli were still present in the throat; so that, good as these results are, it would be scarcely fair to take them as representing average diphtheria cases. For this reason we give them separately and do not include them in the general statistics, though it is obvious that it is necessary to put them on record for future reference.

Table LXXXVIII.—Showing number of cases in which Diphtheria bacilli were found, treated with Antitoxic Serum derived from sources other than the Laboratories of the Royal Colleges. Here are noted the day of disease on which the injection was made, the amount of antitoxic serum injected in one or more injections within 48 hours after the first injection, the average amount injected per patient, the total quantity administered during the treatment of the cases, and the average amount for each case. The mortality per cent. for each hospital is given in the last column.

1894.

Hospitals.	1		2		3		4		5		6		7		8 and upwards		Onset in Hospital		Total.		Mortality per Cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Fountain.	...		...		...		1	0	1	0	...		...		...		3	1	5	1	20·0
Quantity injected within 48 hours ...	...		...		...		10 c.c.		10 c.c.		...		...		...		60 c.c.		80 c.c.		
Average c.c. per patient	...		...		...		10·0		10·0		...		...		...		20·0		16·0		
Total quantity injected during treatment	...		...		...		20		10		...		...		...		80		110		
Average c.c. per patient	...		...		...		20·0		10·0		...		...		...		26·6		22·0		
Eastern.	...		...		...		...		...		...		...		...		1	1	1	1	100·0
Quantity injected within 48 hours ...	...		...		...		...		...		...		...		...		35 c.c.		35 c.c.		
Average c.c. per patient	...		...		...		...		...		...		...		...		35·0		35·0		
Total quantity injected during treatment	...		...		...		...		...		...		...		...		60		60		
Average c.c. per patient	...		...		...		...		...		...		...		...		60·0		60·0		
South-Eastern.	...		3	0	4	0	3	0	2	0	1	0	3	0	...		2	0	18	0	0·0
Quantity injected within 48 hours ...	...		119 c.c.		100 c.c.		55 c.c.		35 c.c.		20 c.c.		65 c.c.		...		60 c.c.		454 c.c.		
Average c.c. per patient	...		39·6		25·0		18·3		17·5		20·0		21·6		...		30·0		25·2		
Total quantity injected during treatment	...		149		100		65		35		20		65		...		80		514		
Average c.c. per patient	...		49·6		25·0		21·6		17·5		20·0		21·6		...		40·0		28·5		
Total.	...		3	0	4	0	4	0	3	0	1	0	3	0	...		6	2	24	2	8·3
Quantity injected within 48 hours ...	...		119 c.c.		100 c.c.		65 c.c.		45 c.c.		20 c.c.		65 c.c.		...		155 c.c.		569 c.c.		
Average c.c. per patient	...		39·6		25·0		16·2		15·0		20·0		21·6		...		25·8		23·7		
Total quantity injected during treatment	...		149		100		85		45		20		65		...		220		684		
Average c.c. per patient	...		49·6		25·0		21·2		15·0		20·0		21·6		...		36·6		28·5		

Few cases in 1894.

In this Table (LXXXVIII.) are given certain details connected with the injection of antitoxin during the year 1894. In the first column we have the names of the hospitals, and in the first line the day of the disease on which the antitoxin was first injected. Then are arranged in each section of the table, first, the number of cases injected and the number of deaths that occurred; the total being given in the last column but one, and the total percentage mortality in the last column. Beneath this comes the number of cubic centimetres injected during the first 48 hours in hospital, this figure being the only one that is constant in the Official Reports; but the majority of the cases coming under this heading were in all probability injected within the first 24 hours after admission. There may have been, of course, several injections during the first 48 hours, but the amount of antitoxin is given as a whole. In the next line is given the average amount of antitoxin injected during this period; then follows the total amount injected into the whole of the cases, and during the whole course of the disease; and in the last line we have the average amount injected into each patient during the course of the disease, whether the patient lived or died. By simply multiplying the number of c.c. by 20—the calculated average number of units per c.c. of the serum in use at that period—the antitoxic value of the serum is obtained in units. In this table the Fountain, Eastern, and South-Eastern Hospitals only are represented, as they appear to have been the only hospitals (that used antitoxic serum at this period) from which specimens were sent for bacteriological examination from cases that were admitted in 1894 but were examined in 1895. The total number of cases for these hospitals is also given. It will at once be seen that these numbers are exceedingly small, and that the number of units of antitoxin was also very low, being only about 560 units for each case. The mortality was also exceedingly low, but the number of cases is so small that very little reliance can be placed upon these figures for general purposes.

TABLE LXXXIX.—Giving cases in which Diphtheria bacilli were found, which were treated with Antitoxic Serum supplied from the Laboratories of the Royal Colleges. The day of disease on which the injection was made is given in the first line. The amount of antitoxin injected in one or more injections within 48 hours after the first injection is given in units. Then follow the average amount injected per patient, the total quantity administered during the treatment of the cases, and the average amount given in each case. The mortality per cent. for each hospital is given in the last column.

1895.

Hospitals.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per Cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
FOUNTAIN.	2	1	23	3	34	9	36	7	32	8	18	3	9	0	16	9	9	3	1	1	180	44	24·4
Units injected within 48 hours	4,200		19,910		27,025		34,425		34,725		12,765		8,250		16,075		13,120		800		171,295		
Average units per patient ...	2100·0		865·6		794·8		956·2		1085·1		709·1		916·6		1004·6		1457·7		800·0		951·6		
Total units injected during treatment	4,200		31,805		42,135		44,365		39,680		15,265		9,700		18,400		15,975		800		222,325		
Average units per patient ...	2100·0		1382·8		1239·2		1232·3		1240·0		848·05		1077·7		1150·0		1775·0		800·0		1235·1		
WESTERN.	...		19	2	36	15	36	10	26	9	24	6	6	3	24	11	3	0	16	0	190	56	29·4
Units injected within 48 hours	...		23,650		58,380		85,455		49,210		19,405		16,900		37,400		4,130		10,325		304,855		
Average units per patient ...	...		1244·7		1621·6		2373·7		1892·6		808·5		2816·6		1558·3		1376·6		645·3		1604·5		
Total units injected during treatment	...		29,550		75,295		90,040		57,030		31,355		19,400		44,200		4,130		19,600		370,600		
Average units per patient ...	...		1555·2		2091·5		2501·1		2193·4		1306·4		3233·3		1841·6		1376·6		1225·0		1950·5		
EASTERN.	5	3	17	4	15	5	27	8	20	5	12	4	10	6	17	4	16	4	...		139	43	30·9
Units injected within 48 hours	5,830		30,445		36,295		49,325		25,275		21,375		20,420		39,030		21,320		...		249,315		
Average units per patient ...	1166·0		1790·8		2419·6		1826·8		1263·7		1781·2		2042·0		2295·8		1332·5		...		1793·6		
Total units injected during treatment	6,810		35,625		49,340		68,325		42,495		27,405		28,120		50,165		24,290		...		332,575		
Average units per patient ...	1362·0		2095·5		3289·3		2530·5		2124·7		2283·7		2812·0		2950·8		1518·1		...		2392·6		
SOUTH-EASTERN.	3	0	29	2	37	5	32	5	29	6	17	0	17	5	24	6	10	0	...		198	29	14·6
Units injected within 48 hours	3,150		46,200		67,725		53,175		43,855		28,700		27,125		38,645		10,650		...		319,225		
Average units per patient ...	1050·0		1593·1		1830·4		1661·7		1512·2		1688·2		1595·5		1610·2		1065·0		...		1612·2		
Total units injected during treatment	4,725		51,450		78,225		59,955		48,405		31,850		28,175		43,470		13,650		...		359,905		
Average units per patient ...	1575·0		1774·1		2114·1		1873·5		1669·1		1873·5		1657·3		1811·2		1365·0		...		1817·7		
SOUTH-WESTERN.	5	1	24	3	26	6	44	11	14	10	15	5	7	1	17	6	1	0	...		153	43	28·1
Units injected within 48 hours	8,050		43,750		33,475		61,500		26,600		41,650		14,000		35,000		1,400		...		265,425		
Average units per patient ...	1610·0		1822·9		1287·5		1397·7		1900·0		2776·6		2000·0		2058·8		1400·0		...		1734·8		
Total units injected during treatment	16,825		81,775		90,975		177,530		59,075		49,500		22,050		50,075		1,400		...		549,205		
Average units per patient ...	3365·0		3407·2		3499·03		4034·7		4219·6		3300·0		3150·0		2945·5		1400·0		...		3589·5		
NORTH-WESTERN.	1	0	14	4	21	10	18	6	11	6	18	8	4	1	11	4	...		...		98	39	39·7
Units injected within 48 hours	1,400		12,425		28,925		18,150		10,675		20,175		4,025		13,365		...		...		109,140		
Average units per patient ...	1400·0		887·5		1377·3		1008·3		970·4		1120·8		1006·2		1215·0		...		...		1113·6		
Total units injected during treatment	1,400		14,700		30,775		22,000		10,675		24,875		4,025		16,325		...		...		124,775		
Average units per patient ...	1400·0		1050·0		1465·4		1222·2		970·4		1381·9		1006·2		1484·09		...		...		1273·2		
NORTHERN.	49	4	...		...		...		...		...		...		...		...		...		49	4	8·1
Units injected within 48 hours	39,885		...		...		...		...		...		...		...		...		...		39,885		
Average units per patient ...	814·05		...		...		...		...		...		..		...		...		...		814·05		
Total units injected during treatment	42,730		...		...		...		...		...		...		...		...		...		42,730		
Average units per patient ...	872·04		...		...		...		...		...		...		...		...		...		872·04		
TOTAL.	65	9	126	18	169	50	193	47	132	44	104	26	53	16	109	40	39	7	17	1	1,007	258	25·6
Units injected within 48 hours	62,515		176,380		251,825		302,030		190,340		144,070		90,720		179,515		50,620		11,125		1,459,140		
Average units per patient ...	961·7		1399·8		1490·08		1564·9		1441·9		1385·2		1711·6		1646·9		1297·9		654·4		1448·9		
Total units injected during treatment	76,690		244,905		366,745		462,215		257,360		180,250		111,470		222,635		59,445		20,400		2,002,115		
Average units per patient ...	1179·8		1943·6		2170·08		2394·8		1949·6		1733·1		2103·2		2042·5		1524·2		1200·0		1988·1		

In Tables LXXXIX. and XC. are given the cases treated with antitoxin in 1895. These tables are necessarily divided into two—one including patients treated with antitoxin manufactured in the laboratories specially for the Board, and the second including those cases treated with antitoxin derived from other sources.

Comparison of results obtained with different antitoxins.

Some indication of the advantage of using stronger antitoxin and a larger number of units may be obtained by a comparison of these two tables. It will be seen that, although there are most extraordinary differences in the results obtained at different hospitals, the mortality over the whole is fairly comparable in the two sets of cases. Reckoning the strength of the antitoxin at its lowest in that supplied by the laboratories, and reckoning the strength of that supplied from other sources as averaging 20 units per c.c. (the average calculated by Roux, Ruffer, Calmette, Madsen, and others), we find that in the year 1895 there were 1,061 cases in which diphtheria bacilli were demonstrated that received on an average 678 units each. Of these cases 315 died, giving a percentage mortality of 29·6. Of 1,007 similar cases treated with the serum from the laboratories of the Royal Colleges (an average of 1,988 units per patient) 258 died, giving a percentage mortality of 25·6. At one hospital, however, the results were much better, and in two others slightly better, where the smaller doses were used, but the general results were very much improved by the use of the larger number of units. It should be pointed out that one of the hospitals in which there was no improvement was the Northern Hospital, in which, as the cases are treated on the first day of the disease, it is necessary, as experience has proved, to inject only comparatively small doses. These tables will well repay careful analysis.

Table XC.—Giving cases in which Diphtheria bacilli were found, which were treated with Antitoxic Serum derived from sources other than the Laboratories of the Royal Colleges. The day of disease on which the injection was made is given in the first line. The amount of antitoxic serum injected in one or more injections within 48 hours after the first injection is given in cubic centimetres. Then follow the average amount injected per patient, the total quantity administered during the treatment of the cases, and the average amount given in each case. The mortality per cent. for each hospital is given in the last column.

1895.

Hospitals.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per Cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Fountain.	3	0	18	3	14	5	14	5	19	3	10	6	3	1	15	6	7	0	4	2	107	31	28·9
Quantity in c.c. injected within 48 hours	32		386		535		560		479		505		117		288		20		65		2,987		
Average c.c. per patient	10·6		21·4		38·2		40·0		25·2		50·5		39·0		19·2		2·8		16·2		27·9		
Total quantity injected during treatment	62		519		561		670		556		572		117		288		115		92		3,552		
Average c.c. per patient	20·6		28·8		40·07		47·8		29·2		57·2		39·0		19·2		16·4		23·0		33·1		
Western.	8	0	30	2	37	3	38	13	29	7	14	5	10	4	3	1	1	0	52	21	222	56	25·2
Quantity in c.c. injected within 48 hours	255		907		1,213		1,202		1,138		610		275		75		20		2,227		7,922		
Average c.c. per patient	31·8		30·2		32·7		31·6		39·2		43·5		27·5		25·0		20·0		42·8		35·6		
Total quantity injected during treatment	255		907		1,213		1,586		1,152		620		275		75		20		2,593		8,696		
Average c.c. per patient	31·8		30·2		32·7		41·7		39·7		44·2		27·5		25·0		20·0		49·8		39·1		
Eastern.	4	3	30	10	35	12	24	12	14	7	13	5	11	3	21	7	10	0	1	0	163	59	36·1
Quantity in c.c. injected within 48 hours	157		431		673		506		316		267		237		498		205		20		3,310		
Average c.c. per patient	39·2		14·3		19·2		21·08		22·5		20·5		21·5		23·7		20·5		20·0		20·3		
Total quantity injected during treatment	189		623		842		710		389		320		265		564		205		20		4,127		
Average c.c. per patient	47·2		20·7		24·05		29·5		27·7		24·6		24·09		26·8		20·5		20·0		25·3		
South-Eastern.	10	1	41	4	49	15	48	19	22	11	22	8	13	8	11	3	6	1	...		222	70	31·5
Quantity in c.c. injected within 48 hours	260		1,210		1,610		1,589		920		726		415		360		115		...		7,205		
Average c.c. per patient	26·0		29·5		32·8		33·1		41·8		33·0		31·9		32·7		19·1		...		32·4		
Total quantity injected during treatment	275		1,415		1,662		1,858		1,100		756		450		380		225		...		8,121		
Average c.c. per patient	27·5		34·5		33·9		38·7		50·0		34·3		34·6		34·5		37·5		...		36·5		
South-Western.	5	0	24	3	26	9	27	10	30	6	19	13	3	1	14	6	...		2	1	150	49	32·6
Quantity in c.c. injected within 48 hours	200		819		876		1,225		1,165		618		100		615		...		45		5,663		
Average c.c. per patient	40·0		34·1		33·6		45·3		38·8		32·5		33·3		43·9		...		22·5		37·7		
Total quantity injected during treatment	230		1,074		1,096		1,522		1,298		1,085		110		780		...		70		7,265		
Average c.c. per patient	46·0		44·7		42·1		56·3		43·2		57·1		36·6		55·7		...		35·0		48·4		
North-Western.	5	0	45	8	38	13	35	8	14	4	18	5	8	5	13	6	...		1	0	177	49	27·6
Quantity in c.c. injected within 48 hours	60		835		970		625		290		255		145		230		...		10		3,420		
Average c.c. per patient	12·0		18·5		25·5		17·8		20·7		14·1		18·1		17·6		...		10·0		19·3		
Total quantity injected during treatment	60		925		1,110		760		310		295		160		255		...		20		3,895		
Average c.c. per patient	12·0		20·5		29·2		21·7		22·1		16·3		20·0		19·6		...		20·0		22·005		
Northern.	20	1	...		...		...		...		...		...		...		...		...		20	1	5·0
Quantity in c.c. injected within 48 hours	320		...		...		...		...		...		...		...		...		...		320		
Average c.c. per patient	16·0		...		...		...		...		...		...		...		...		...		16·0		
Total quantity injected during treatment	350		...		...		...		...		...		...		...		...		...		350		
Average c.c. per patient	17·5		...		...		...		...		...		...		...		...		...		17·5		
Total.	55	5	180	30	199	57	186	67	128	38	96	42	48	22	77	29	24	1	60	24	1,061	315	29·6
Quantity in c.c. injected within 48 hours	1,284		4,588		5,877		5,707		4,308		2,981		1,289		2,066		360		2,367		30,827		
Average c.c. per patient	23·3		25·4		29·5		30·6		33·6		31·05		26·8		26·8		15·0		39·4		29·05		
Total quantity injected during treatment	1,421		5,463		6,484		7,106		4,805		3,648		1,377		2,342		565		2,795		36,006		
Average c.c. per patient	25·8		30·3		32·5		38·2		37·5		38·0		28·6		30·4		23·5		46·5		33·9		

TABLE XCI.—Giving cases in which no Diphtheria bacilli were found, but which were treated with Antitoxic Serum supplied from the Laboratories of the Royal Colleges. The day of disease on which the injection was made is given in the first line. The amount of antitoxin injected in one or more injections within 48 hours after first injection is given in units. Then follow the average amount injected per patient, the total quantity administered during the treatment of the cases, and the average amount given in each case. The mortality per cent. for each hospital is given in the last column.

1895.

Hospitals.	1 (Cases. Deaths.)	2 (Cases. Deaths.)	3 (Cases. Deaths.)	4 (Cases. Deaths.)	5 (Cases. Deaths.)	6 (Cases. Deaths.)	7 (Cases. Deaths.)	8 and upwards. (Cases. Deaths.)	Onset in Hospital. (Cases. Deaths.)	Total. (Cases. Deaths.)	Mortality per Cent.
FOUNTAIN.	...	2 0	...	1 0	5 2	1 0	1 1	...	...	10 3	30·0
Units injected within 48 hours ...	...	1,900	...	1,600	4,650	4,200	1,800	...	...	14,150	
Average units per patient	...	950·0	...	1600·0	930·0	4200·0	1800·0	...	...	1415·0	
Total units injected during treatment	...	1,900	...	1,600	5,400	4,400	3,000	...	...	16,300	
Average units per patient	...	950·0	...	1600·0	1080·0	4400·0	3000·0	...	...	1630·0	
WESTERN.	1 0	...	2 0	...	4 2	...	2 2	4 0	3 0	16 4	25·0
Units injected within 48 hours ...	1,400	...	3,100	...	6,450	...	2,200	5,200	3,200	21,550	
Average units per patient	1400·0	...	1550·0	...	1612·5	...	1100·0	1300·0	1066·6	1346·8	
Total units injected during treatment	1,400	...	3,550	...	7,950	...	2,900	6,600	4,000	26,400	
Average units per patient	1400·0	...	1775·0	...	1987·5	...	1450·0	1650·0	1333·3	1650·0	
EASTERN.	...	...	1 0	4 2	1 0	1 0	1 1	5 3	...	13 6	46·1
Units injected within 48 hours ...	...	...	3,600	6,045	2,300	3,000	525	9,400	...	24,870	
Average units per patient	...	...	3600·0	1511·2	2300·0	3000·0	525·0	1880·0	...	1913·07	
Total units injected during treatment	...	...	3,600	6,045	2,300	3,000	525	12,450	...	27,920	
Average units per patient	...	...	3600·0	1511·2	2300·0	3000·0	525·0	2490·0	...	2147·6	
SOUTH-EASTERN.	...	10 1	1 0	6 2	...	3 1	2 0	3 0	4 0	29 4	13·7
Units injected within 48 hours ...	...	16,975	2,100	7,100	...	7,000	2,800	4,200	4,550	44,725	
Average units per patient	...	1697·5	2100·0	1183·3	...	2333·3	1400·0	1400·0	1137·5	1542·2	
Total units injected during treatment	...	17,325	2,100	8,050	...	7,000	2,800	4,200	5,250	46,725	
Average units per patient	...	1732·5	2100·0	1341·6	...	2333·3	1400·0	1400·0	1312·5	1611·2	
SOUTH-WESTERN.	...	4 1	3 0	3 0	1 0	4 1	1 1	2 1	...	18 4	22·2
Units injected within 48 hours ...	...	9,100	3,525	7,000	2,800	8,995	3,000	2,200	...	36,620	
Average units per patient	...	2275·0	1175·0	2333·3	2800·0	2248·7	3000·0	1100·0	...	2034·4	
Total units injected during treatment	...	9,700	3,525	7,000	9,100	12,775	3,000	2,730	...	47,830	
Average units per patient	...	2425·0	1175·0	2333·3	9100·0	3193·7	3000·0	1365·0	...	2657·2	
NORTH-WESTERN.	...	1 0	...	1 0	2 1	1 1	...	1 1	...	6 3	50·0
Units injected within 48 hours ...	...	1,400	...	2,800	2,200	1,400	...	1,600	...	9,400	
Average units per patient	...	1400·0	...	2800·0	1100·0	1400·0	...	1600·0	...	1566·6	
Total units injected during treatment	...	1,400	...	2,800	2,200	1,400	...	5,600	...	13,400	
Average units per patient	...	1400·0	...	2800·0	1100·0	1400·0	...	5600·0	...	2233·3	
NORTHERN.	2 0	...	...	...	...	...	...	...	...	2 0	0·0
Units injected within 48 hours ...	1,900	...	...	...	...	...	...	...	...	1,900	
Average units per patient	950·0	...	...	...	...	...	...	...	...	950·0	
Total units injected during treatment	1,900	...	...	...	...	...	...	...	...	1,900	
Average units per patient	950·0	...	...	...	...	...	...	...	...	950·0	
TOTAL.	3 0	17 2	7 0	15 4	13 5	10 3	7 5	15 5	7 0	94 24	25·5
Units injected within 48 hours ...	3,300	29,375	12,325	24,545	18,400	24,595	10,325	22,600	7,750	153,215	
Average units per patient	1100·0	1727·9	1760·7	1636·3	1415·3	2459·5	1475·0	1506·6	1107·1	1629·9	
Total units injected during treatment	3,300	30,325	12,775	25,495	26,950	28,575	12,225	31,560	9,250	180,475	
Average units per patient	1100·0	1783·8	1825·0	1699·6	2073·07	2857·5	1746·4	2105·3	1321·4	1919·9	

On coming to the cases in which no diphtheria bacilli were found but which were nevertheless injected with antitoxin (Tables XCI., XCII.), the figures are almost entirely reversed, as we find that the larger number of units were given to cases in which, speaking generally, there was the highest mortality. In order to keep these figures comparable with those for 1896, it is well to add together all the cases that were injected, whether diphtheria bacilli were found or not. We then have the results given in Table XCV.). *Use of antitoxin in cases in which no diphtheria bacilli were found.*

Dealing with the statistics for the year 1896 (Table XCIII.), special attention should be paid to them, as it is only in this year that we were in a position to check the figures efficiently. In every case the number of antitoxin units is under-estimated rather than over-estimated, as the actual recently tested strength of the antitoxin has been taken—a strength that is often under the original strength, as we know that there is an appreciable falling off *Figures in 1896 very reliable.*

in the strength of every antitoxin; and in the stronger forms this falling off, as will be pointed out later, may be considerable. Still, these figures represent, approximately, the strength of the different antitoxins used, and, allowing for the correction above referred to, may be taken as accurate. It should be pointed out, however, that at most of the hospitals there were small quantities of serum of which no notes of the numbers were given on the bed card. By careful investigation of the statistics kept in the laboratories concerning the different serums sent out to these hospitals, we are able to trace most of these samples and to give an average strength for such as were not recorded on the bed cards. At one hospital no note of any kind was ever entered as to the number of the serum used, and it was necessary to rely entirely upon the laboratory books for the strengths of the different serums used; by comparing the dates at which these serums were sent out with the dates at which the injection was made, it was possible to obtain fairly accurate figures under this heading.

Difficulty of obtaining absolutely accurate statistics.

TABLE XCII.—Giving cases in which no Diphtheria bacilli were found, but which were treated with Antitoxic Serum from sources other than the Laboratories of the Royal Colleges. The day of disease on which the injection was made is given in the first line. The amount of antitoxic serum injected in one or more injections within 48 hours after first injection is given in cubic centimetres. Then follow the average amount injected per patient, the total quantity administered during the treatment of the cases, and the average amount given in each case. The mortality per cent. for each hospital is given in the last column.

1895.

Hospitals.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per Cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
FOUNTAIN.	...		...		4	0	4	0	3	1	1	0	2	0	3	1	...		17	2	
Quantity in c.c. injected within 48 hours ...	...		...		47		47		70		37		57		56		...		314		
Average c.c. per patient	...		...		11·7		11·7		23·3		37·0		28·5		18·6		...		18·4		11·7
Total quantity injected during treatment	...		...		47		57		70		37		57		56		...		324		
Average c.c. per patient	...		...		11·7		14·2		23·3		37·0		28·5		18·6		...		19·05		
WESTERN.	...		5	1	14	1	14	1	7	0	5	0	1	0	8	0	3	0	57	3	
Quantity in c.c. injected within 48 hours ...	...		100		315		325		175		90		10		190		60		1,265		
Average c.c. per patient	...		20·0		22·5		23·2		25·0		18·0		10·0		23·7		20·0		22·1		5·2
Total quantity injected during treatment	...		100		315		325		185		90		10		190		60		1,275		
Average c.c. per patient	...		20·0		22·5		23·2		26·4		18·0		10·0		23·7		20·0		22·3		
EASTERN.	1	0	11	2	4	1	11	4	5	2	...		5	0	10	4	1	0	48	13	
Quantity in c.c. injected within 48 hours ...	5		262		61		249		89		...		92		220		5		983		
Average c.c. per patient	5·0		23·8		15·2		22·6		17·8		...		18·4		22·0		5·0		20·4		27·08
Total quantity injected during treatment	5		262		61		306		129		...		92		280		5		1,140		
Average c.c. per patient	5·0		23·8		15·2		27·8		25·8		...		18·4		28·0		5·0		23·7		
SOUTH-EASTERN.	3	0	14	1	12	1	9	0	6	0	5	0	2	0	2	0	7	0	60	2	
Quantity in c.c. injected within 48 hours ...	105		563		400		285		145		160		58		100		245		2,061		
Average c.c. per patient	35·0		40·2		33·3		31·6		24·1		32·0		29·0		50·0		35·0		34·3		3·3
Total quantity injected during treatment	105		628		450		310		145		240		58		100		245		2,281		
Average c.c. per patient	35·0		44·8		37·5		34·4		24·1		48·0		29·0		50·0		35·0		38·01		
SOUTH-WESTERN.	...		4	2	2	0	4	0	5	3	2	0	1	0	3	2	...		21	7	
Quantity in c.c. injected within 48 hours ...	...		135		25		140		220		65		30		115		...		730		
Average c.c. per patient	...		33·7		12·5		35·0		44·0		32·5		30·0		38·3		...		34·7		33·3
Total quantity injected during treatment	...		195		25		155		240		85		30		115		...		845		
Average c.c. per patient	...		48·7		12·5		38·7		48·0		42·5		30·0		38·3		...		40·2		
NORTH-WESTERN.	1	0	6	1	10	3	5	3	2	0	3	0	4	2	4	0	1	1	36	10	
Quantity in c.c. injected within 48 hours ...	10		115		175		75		20		55		45		40		20		555		
Average c.c. per patient	10·0		19·1		17·5		15·0		10·0		18·3		11·2		10·0		20·0		15·4		27·7
Total quantity injected during treatment	10		115		175		105		20		55		45		40		20		585		
Average c.c. per patient	10·0		19·1		17·5		21·0		10·0		18·3		11·2		10·0		20·0		16·2		
NORTHERN.	2	0	...		...		...		...		...		...		...		...		2	0	
Quantity in c.c. injected within 48 hours ...	33		...		...		...		...		...		...		...		...		33		
Average c.c. per patient	16·5		...		...		...		...		...		...		...		...		16·5		0·0
Total quantity injected during treatment	33		...		...		...		...		...		...		...		...		33		
Average c.c. per patient	16·5		...		...		...		...		...		...		...		...		16·5		
TOTAL.	7	0	40	7	46	6	47	8	28	6	16	0	15	2	30	7	12	1	241	37	
Quantity in c.c. injected within 48 hours ...	153		1,175		1,023		1,121		719		407		292		721		330		5,941		
Average c.c. per patient	21·8		29·3		22·2		23·8		25·6		25·4		19·4		24·03		27·5		24·6		15·3
Total quantity injected during treatment	153		1,300		1,073		1,258		789		507		292		781		330		6,483		
Average c.c. per patient	21·8		32·5		23·3		26·7		28·1		31·6		19·4		26·03		27·5		26·9		

TABLE XCIII.—Giving cases in which Diphtheria bacilli were found, which were treated with Antitoxic Serum supplied from the Laboratories of the Royal Colleges. The day of disease on which the injection was made is given in the first line. The amount of antitoxin injected in one or more injections within 48 hours after first injection is given in units. Then follow the average amount injected per patient, the total quantity administered during the treatment of the cases, and the average amount given in each case. The mortality per cent. for each hospital is given in the last column.

1896.

Hospitals.	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per Cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
FOUNTAIN.	3	1	80	11	116	18	121	37	99	28	66	15	36	11	60	13	38	4	19	7	638	145	22·7
Units injected within 48 hours	10,330		263,370		517,495		435,285		410,420		316,855		153,810		182,390		162,775		63,710		2,516,440		
Average units per patient .	3443·3		3292·1		4461·1		3597·3		4145·6		4800·8		4272·5		3039·8		4283 5		3353·1		3944·2		
Total units injected during treatment	12,325		431,935		668,195		616,065		581,580		373,575		186,660		266,780		180,635		64,624		3,382,374		
Average units per patient ...	4108·3		5399·1		5760·3		5091·4		5874·5		5660·2		5185·0		4446·3		4753·5		3401·2		5301·5		
WESTERN.	18	1	83	21	119	28	119	36	81	18	54	16	33	11	58	20	48	3	...		613	154	25·1
Units injected within 48 hours	39,045		260,895		428,610		430,980		320,225		171,640		130,910		214,745		143,355		...		2,140,405		
Average units per patient ...	2169·1		3143·3		3601·7		3621·6		3953·3		3178·5		3966·9		3702·5		2986·5		...		3491·6		
Total units injected during treatment..	49,780		297,980		565,270		493,545		378,680		243,400		151,920		257,700		144,405		...		2,582,680		
Average units per patient ..	2765·5		3590·1		4750·1		4147·4		4675·06		4507·4		4603·6		4443·1		3008·4		...		4213·1		
EASTERN.	11	1	63	8	80	19	91	18	82	17	54	11	27	5	64	13	19	2	...		491	94	19·1
Units injected within 48 hours	25,265		264,710		295,205		438,205		443,165		230,830		139,745		237,825		57,350		...		2,132,300		
Average units per patient ...	2296·8		4201·7		3690·06		4815·4		5404·4		4274·6		5175·7		3716·01		3018·4		...		4342·7		
Total units injected during treatment	49,165		371,840		428,460		606,545		553,920		323,845		203,302		284,330		91,350		...		2,912,757		
Average units per patient ...	4469·5		5902·2		5355·7		6665·3		6755·1		5997·1		7529·7		4442·6		4807·8		...		5932·2		
SOUTH-EASTERN.	10	1	77	6	98	18	102	26	67	18	54	14	41	10	48	15	11	2	1	1	509	111	21·8
Units injected within 48 hours	33,100		265,690		380,680		373,385		198,550		278,750		130,860		127,700		28,850		2,250		1,819,815		
Average units per patient ..	3310·0		3450·5		3884·4		3660·6		2963·4		5162·03		3191·7		2660·4		2622·7		2250·0		3575·2		
Total units injected during treatment	30,905		392,515		546,630		627,350		401,880		327,090		169,300		292,425		35,860		4,000		2,827,925		
Average units per patient ...	3090·5		5097·5		5577·8		6150·4		5998·2		6056·6		4129·2		6092·1		3260·0		4000·0		5555·8		
SOUTH-WESTERN.	7	1	46	0	70	14	58	18	46	13	34	10	19	4	31	9	...		...		311	69	22·1
Units injected within 48 hours	16,500		120,972		215,100		254,500		179,425		184,340		59,000		112,500		...		...		1,142,337		
Average units per patient ...	2357·1		2629·8		3072·8		4387·9		3900·5		5421·7		3105·2		3629·03		...		...		3673·1		
Total units injected during treatment	28,980		193,810		352,185		405,690		309,340		240,595		82,980		170,100		...		...		1,783,680		
Average units per patient ...	4140·0		4213·2		5031·2		6994·6		6724·7		7076·3		4367·3		5487·09		...		...		5735·3		
NORTH-WESTERN.	6	3	42	8	62	21	80	25	63	30	38	13	26	11	37	10	...		...		354	121	34·1
Units injected within 48 hours	37,600		190,250		317,610		431,895		225,700		208,560		116,400		122,965		...		...		1,650,980		
Average units per patient ...	6266·6		4529·7		5122·7		5398·6		3582·5		5488·4		4476·9		3323·3		...		...		4663·7		
Total units injected during treatment	46,600		230,460		370,185		487,390		275,315		252,020		135,070		185,460		...		...		1,982,500		
Average units per patient ...	7766·6		5487·1		5970·7		6092·3		4370·07		6632·1		5195·0		5012·4		...		...		5600·2		
NORTH-EASTERN.	...		...		...		...		...		...		2	1	3	2	13	4	...		18	7	38·8
Units injected within 48 hours	...		...		...		...		...		...		5,400		21,600		60,230		...		87,230		
Average units per patient ...	...		...		...		...		...		...		2700·0		7200·0		4633·0		...		4846·1		
Total units injected during treatment	...		...		...		...		...		...		9,250		24,600		62,350		...		96,200		
Average units per patient ...	...		...		...		...		...		...		4625·0		8200·0		4796·1		...		5344·4		
BROOK.	3	2	24	3	36	7	30	3	26	8	20	5	9	4	14	6	9	2	...		171	40	23·3
Units injected within 48 hours	27,900		187,380		280,380		244,360		248,040		186,070		88,820		131,590		45,720		...		1,440,260		
Average units per patient ...	9300·0		7807·5		7788·3		8145·3		9540·0		9303·5		9868·8		9399·2		5080·0		...		8422·5		
Total units injected during treatment...	41,500		249,300		401,300		308,300		285,750		201,150		128,250		170,450		82,650		...		1,868,650		
Average units per patient ..	13833·3		10387·5		11147·2		10276·6		10990·3		10057·5		14250·0		12175·0		9183·3		...		10927·7		
NORTHERN.	179	3	...		...		...		...		...		...		...		...		...		179	3	1·6
Units injected within 48 hours	404,620		...		...		...		...		...		...		...		...		...		404,620		
Average units per patient ...	2260·4		...		...		...		...		...		...		...		...		...		2260·4		
Total units injected during treatment...	423,765		...		...		...		...		...		...		...		...		...		423,765		
Average units per patient ...	2367·4		...		...		...		...		...		...		...		...		...		2367·4		
GORE FARM.	57	0	...		...		...		...		...		...		...		...		...		57	0	0·0
Units injected within 48 hours	190,670		...		...		...		...		...		...		...		...		...		190,670		
Average units per patient ...	3345·08		...		...		...		...		...		...		...		...		...		3345 08		
Total units injected during treatment...	236,230		...		...		...		...		...		...		...		...		...		236,230		
Average units per patient ..	4144 3		...		...		...		...		...		...		...		...		...		4144·3		
TOTAL.	294	13	415	57	581	125	601	163	464	132	320	84	193	57	315	88	138	17	20	8	3341	744	22·2
Units injected within 48 hours	785,030		1,553,267		2,435,080		2,608,610		2,025,525		1,577,045		824,945		1,151,315		498,280		65,960		13,525,057		
Average units per patient ...	2670·1		3742·8		4191·1		4340·4		4365·3		4928·2		4274·3		3654·9		3610·7		3298·0		4048·2		
Total units injected during treatment...	919,250		2,167,840		3,332,225		3,544,885		2,786,465		1,961,645		1,066,732		1,651,845		597,250		68,624		18,096,761		
Average units per patient ...	3126·7		5223·7		5735·3		5898·3		6005·3		6130·1		5527·1		5243·9		4327·8		3431·2		5416·5		

TABLE XCIV.—Giving cases in which no Diphtheria bacilli were found, but which were treated with Antitoxic Serum supplied from the Laboratories of the Royal Colleges. The day of disease on which the injection was made is given in the first line. The amount of antitoxic serum injected in one or more injections within 48 hours after first injection is given in units. Then follow the average amount injected per patient, the total quantity administered during the treatment of the cases, and the average amount given in each case. The mortality per cent. for each hospital is given in the last column.

1896.

Hospitals.	1	2	3	4	5	6	7	8 and upwards.	Onset in Hospital.	Total.	Mortality per Cent.
	Cases. Deaths.	Cases. Deaths.	Cases. Deaths.	Cases. Deaths.	Cases. Deaths.	Cases. Deaths.	Cases. Deaths.	Cases. Deaths.	Cases. Deaths.	Cases. Deaths.	
FOUNTAIN.	...	4 0	8 3	20 4	15 4	8 3	7 2	18 7	7 1	87 24	27·5
Units injected within 48 hours ...	...	13,245	20,595	100,280	44,482	22,295	23,530	63,450	33,400	321,277	
Average units per patient ..	...	3311·2	2574·3	5014·0	2965·4	2786·8	3361·4	3525·0	4771·4	3692·8	
Total units injected during treatment	...	15,820	30,335	124,360	51,097	26,445	25,955	81,225	33,400	388,637	
Average units per patient ...	...	3955·0	3791·8	6218·0	3406·4	3305·6	3707·8	4512·5	4771·4	4467·09	
WESTERN.	...	6 0	9 1	13 3	10 2	5 2	4 0	22 6	...	69 14	20·2
Units injected within 48 hours ...	...	7,875	19,595	25,495	18,800	9,300	10,800	75,665	...	167,530	
Average units per patient ...	...	1312·5	2177·2	1961·1	1880·0	1860·0	2700·0	3439·3	...	2427·9	
Total units injected during treatment	...	8,125	22,944	30,755	24,030	9,300	11,165	94,994	...	201,313	
Average units per patient ...	...	1354·1	2549·3	2365·7	2403·0	1860·0	2791·2	4317·9	...	2917·5	
EASTERN.	...	3 0	7 1	8 0	8 3	8 3	7 0	14 3	...	55 10	18·1
Units injected within 48 hours ...	...	5,075	14,270	32,515	21,205	16,330	33,800	38,255	...	161,450	
Average units per patient	...	1691·6	2038·5	4064·3	2650·6	2041·2	4828·5	2732·5	...	2935·4	
Total units injected during treatment	...	5,775	23,900	37,415	31,170	20,980	40,100	50,465	...	209,805	
Average units per patient ...	...	1925·0	3414·2	4676·8	3896·2	2622·5	5728·5	3604·6	...	3814·6	
SOUTH-EASTERN.	8 0	10 2	15 5	8 2	16 3	5 4	5 0	14 4	3 0	84 20	23·8
Units injected within 48 hours ...	25,810	52,700	110,350	31,800	73,100	29,800	32,000	76,835	18,000	450,395	
Average units per patient ...	3226·2	5270·0	7356·6	3975·0	4568·7	5960·0	6400·0	5488·2	6000·0	5361·8	
Total units injected during treatment	27,075	54,700	111,650	37,300	74,000	29,800	32,000	85,300	18,000	469,825	
Average units per patient ...	3384·3	5470·0	7443·3	4662·5	4625·0	5960·0	6400·0	6092·8	6000·0	5593·1	
SOUTH-WESTERN.	1 0	3 0	2 2	4 0	3 1	4 1	1 0	1 0	...	19 4	21·05
Units injected within 48 hours ...	330	10,260	13,320	15,200	6,980	33,750	7,000	1,000	...	87,840	
Average units per patient ...	330·0	3420·0	6660·0	3800·0	2326·6	8437·5	7000·0	1000·0	...	4623·1	
Total units injected during treatment	330	18,860	23,320	22,700	8,300	38,750	7,000	1,000	...	120,260	
Average units per patient ...	330·0	6286·6	11660·0	5675·0	2766·6	9687·5	7000·0	1000·0	...	6329·4	
NORTH-WESTERN.	1 0	2 2	8 1	8 1	5 0	5 1	2 2	11 5	...	42 12	28·5
Units injected within 48 hours ...	4,500	6,800	52,925	27,350	26,700	37,800	22,400	49,175	...	227,650	
Average units per patient ...	4500·0	3400·0	6615·6	3418·7	5340·0	7560·0	11200·0	4470·4	...	5420·2	
Total units injected during treatment	5,305	6,800	54,850	29,760	26,700	45,800	22,400	55,665	...	247,280	
Average units per patient ...	5305·0	3400·0	6856·2	3720·0	5340·0	9160·0	11200·0	5060·4	...	5887·6	
NORTH-EASTERN.	...	1 0	...	1 1	1 0	...	...	...	3 1	6 2	33·3
Units injected within 48 hours ...	...	1,500	...	2,500	5,800	...	...	...	10,950	20,750	
Average units per patient ...	...	1500·0	...	2500·0	5800·0	...	...	...	3650·0	3458·3	
Total units injected during treatment	...	1,500	...	2,500	8,700	...	...	...	10,950	23,650	
Average units per patient ...	...	1500·0	...	2500·0	8700·0	...	...	...	3650·0	3941·6	
BROOK.	...	2 0	2 0	4 1	3 0	1 0	2 2	2 0	1 0	17 3	17·6
Units injected within 48 hours ...	...	12,600	11,000	31,000	6,800	6,000	23,320	12,900	8,450	112,070	
Average units per patient ...	...	6300·0	5500·0	7750·0	2266·6	6000·0	11660·0	6450·0	8450·0	6592·3	
Total units injected during treatment	...	12,600	11,000	31,000	13,100	7,800	30,900	12,900	8,450	127,750	
Average units per patient ...	...	6300·0	5500·0	7750·0	4366·6	7800·0	15450·0	6450·0	8450·0	7514·7	
NORTHERN.	27 1	...	...	...	...	...	...	...	...	27 1	3·7
Units injected within 48 hours ...	56,230	...	...	...	...	...	...	...	...	56,230	
Average units per patient ...	2082·5	...	...	...	...	...	...	...	...	2082·5	
Total units injected during treatment	62,250	...	...	...	...	...	...	...	...	62,250	
Average units per patient ...	2305·5	...	...	...	...	...	...	...	...	2305·5	
GORE FARM.	11 0	...	...	...	...	...	...	...	...	11 0	0·0
Units injected within 48 hours ...	60,565	...	...	...	...	...	...	...	...	60,565	
Average units per patient ...	5505·9	...	...	...	...	...	...	...	...	5505·9	
Total units injected during treatment	86,700	...	...	...	...	...	...	...	...	86,700	
Average units per patient ...	7881·8	...	...	...	...	...	...	...	...	7881·8	
TOTAL.	48 1	31 4	51 13	66 12	61 13	36 14	28 6	82 25	14 2	417 90	21·5
Units injected within 48 hours ...	147,435	110,055	242,055	266,140	203,867	155,275	152,850	317,280	70,800	1,665,757	
Average units per patient ...	3071·5	3550·1	4746·1	4032·4	3342·08	4313·1	5458·9	3869·2	5057·1	3994·6	
Total units injected during treatment	181,660	124,180	277,999	315,790	237,097	178,875	169,520	381,549	70,800	1,937,470	
Average per units patient ...	3784·5	4005·8	5450·9	4784·6	3886·8	4968·7	6054·2	4653·03	5057·1	4646·2	

Importance of early and large injections of antitoxin.

It is an exceedingly difficult matter to analyse the figures in table XCIII., but two points are brought into very strong relief. The first of these is that, speaking generally, the larger the number of units used, the better are the results obtained; and, secondly, the greater the proportion of cases injected on the first and second days, the lower is the death-rate. Taking the two extremes, we find that at the Northern and Gore Farm Hospitals, where every case in which diphtheria bacilli were found was injected on the first day, we have in the Gore Farm Hospital every single patient recovering, whilst at the Northern Hospital the percentage mortality is only 1·6 per cent. At the other extreme we have the North-Eastern Hospital with a mortality of 38·8 per cent.; here the number of cases is exceedingly small, and all of them came in certified as suffering from scarlet fever. It is scarcely fair, therefore, to use these figures, especially as the cases in which the onset was not in hospital only numbered five: none of them were injected until the seventh day or later, and three out of the five died. It will be noticed that at the Northern Hospital the number of units injected into each case was about 2,400, at the Gore Farm 4,200, and at the North-Eastern Hospital 5,400,—though here, as will be seen from the table, the serum was given at a much later date. As regards the Brook Hospital, where very large numbers of units were given, the number of cases coming in on the later days of the disease was comparatively large; but even here the large numbers of units given appear to have kept down the percentage mortality to a comparatively low figure, and were it not for the cases that came under treatment on the seventh day or later, the percentage mortality would be very low indeed. It should further be pointed out that the number of units given in each case in the Brook Hospital is comparatively high from the fact that at this hospital they received antitoxin only during the latter half of the year 1896, when the strength of the antitoxic serum was at its highest, and when, therefore, it was a comparatively easy matter to inject full doses of antitoxin. These figures should form a basis with which to compare results obtained in future years; whilst they in turn, as being the only complete set of figures for any single antitoxin year, should be compared with the figures obtained in the pre-antitoxin period.

Number of units given at the different Hospitals.

TABLE XCV.—Showing cases injected with Antitoxic Serum during the year 1895.

Cases injected with Antitoxic Serum from the Laboratories.			Cases injected with Antitoxic Serum from other sources.		
Hospital.	Average Mortality per Cent.	Average Dose of Antitoxin given.	Hospital.	Average Mortality per Cent.	Average Dose of Antitoxin given.
Fountain	24·7	1,255·9 units.	Fountain	26·6	31·2 c.c. = 624 units.
Western	29·1	1,927·0 „	Western	21·1	35·7 „ = 714 „
Eastern	32·2	2,371·6 „	Eastern	34·1	24·9 „ = 498 „
South-Eastern ...	14·5	1,790·1 „	South-Eastern ...	25·5	36·8 „ = 736 „
South-Western ...	27·4	2,965·1 „	South-Western ...	32·8	47·4 „ = 948 „
North-Western ..	40·3	1,328·6 „	North-Western ...	27·7	21·0 „ = 420 „
Northern	7·8	875·1 „	Northern	4·5	17·4 „ = 348 „
Average ..	25·6	1,982·3 „	Average ...	27·0	32·6 „ = 652 „

Case in which no diphtheria bacilli were found, but in which mortality was high.

In 1896 there were in the various hospitals 417 cases in which diphtheria bacilli were not found (Table XCIV.), but which, from their clinical appearances, might have been cases of diphtheria; and from the fact that the percentage mortality was almost the same as amongst those in which diphtheria bacilli were found, the diagnosis appears to have been correct, especially as the figures for the individual hospitals have, speaking generally, a remarkable coincidence in the two sets of cases. At the Gore Farm Hospital, again, there are no deaths in 11 cases; at the Northern, there is one death out of 27 cases; whilst at the North-Eastern and North-Western Hospitals we have a percentage death-rate of 33·3 and 28·5 respectively. At the Fountain Hospital the death-rate is comparatively high in this class of case, but this appears to be due in great measure to the fact that such a large proportion of the cases were not injected until the fourth day of the disease. The average number of units used is not quite so high as in the cases in which diphtheria bacilli were found, although the same relative proportion holds throughout, except at the Western, Eastern, and North-Eastern Hospitals.

If these cases in which diphtheria bacilli were not found but which were injected are included amongst the diphtheria cases for the year, the results come out as follows (Table XCVI.):—

TABLE XCVI.—Showing total cases injected with Antitoxic Serum during the year 1896.

Hospital.	Average Mortality per Cent.	Average Dose of Antitoxin given.
Fountain	23·3	5,201·4 units.
Western	24·6	4,082·1 „
Eastern	19·0	5,719·0 „
South-Eastern ...	22·0	5,561·1 „
South-Western ...	22·1	5,769·5 „
North-Western ...	33·5	5,630·7 „
North-Eastern ...	37·5	4,993·7 „
Brook	22·8	10,619·1 „
Northern	1·9	2,359·2 „
Gore Farm... ...	0·0 (in 68 cases)	4,800·7 „
Average ...	22·1	5,331·0 „

TABLE XCVII.—Showing number of Injections during 1894 with Antitoxic Serum from sources outside the Laboratories.

Hospital.	Number of Injections. 1			2			3			4			Total.		
	Cases.	Deaths.	Per-centage.	Cases.	Deaths.	Per-centage.	Cases.	Deaths.	Per-centage.	Cases.	Deaths.	Per-centage.	Cases.	Deaths.	Per-centage.
Fountain	1	0	0·0	2	0	0·0	2	1	50·0	...	...	0·0	5	1	20·0
Eastern	...	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0	1	1	100·0
South-Eastern...	4	0	0·0	14	0	0·0	...	...	0·0	...	...	0·0	18	0	0·0
Total	5	0	0·0	16	0	0·0	2	1	50·0	1	1	100·0	24	2	8·3

Table XCVII. gives the number of cases in which diphtheria bacilli were found which were injected with antitoxin on one or more occasions during the year 1894. The number of cases is so small that these are only included in order to make the statistics complete. The whole of the antitoxin used was derived from sources other than the laboratories of the Royal Colleges.

Fall in percentage mortality when more potent antitoxic serum was used.

In 1895, during the period when serum from our laboratories as well as serum from other sources was being used, we have very considerable differences in the results obtained at different hospitals. For instance, it will be noted that at the Western, North-Western, and Northern Hospitals the percentage of fatal cases injected with the somewhat stronger antitoxin supplied by the laboratories is actually higher amongst those cases in which diphtheria bacilli were found than it was when the weaker serum was used. At the other hospitals, however, exactly the reverse was the case, and there was a considerable falling off in the percentage mortality amongst those patients who were injected with the more potent serum. The most marked example of this is at the South-Eastern Hospital, where there is a fall from 31·5 to 14·6 per cent. So great, moreover, is this falling off at the other hospitals, that the completed figures for the whole of the hospitals show a fall in percentage mortality from 29·6 to 25·6 amongst those cases in which diphtheria bacilli were found. Taking the last line of Table XCVIII., in which these figures are set out, it is possible to follow the percentage mortality amongst the cases in which varying numbers of injections were given. Where one injection only was thought to be sufficient, or where there was time to give one only, the death-rate was only 21·2 per cent.; but it is interesting to notice that in this group the stronger serum appears to exert a much more powerful action than does the weaker serum, for with the former in use we have a death-rate of only 15·4 per cent., against 25·05 where the latter is used. Similarly, amongst the cases in which two injections were given, the death-rate when the stronger serum was used was 21·1, against 26·7 where the less potent serum was used; this diminished mortality continuing up to the fifth injection, after which the results become very irregular, and no reliable comparisons can be drawn. These two sets of figures are fairly comparable, because on the one hand we have 1,061 cases treated with the weaker, and on the other 1,007 with the stronger serum. The figures are also of value from the fact that several popular articles have been written with the object of proving that as soon as the serum supplied began to get stronger in its antitoxic activity the death-rate increased; and too much emphasis cannot be laid on the fact that such a statement, when applied to the work carried on in the hospitals under the Board as a whole, is absolutely incorrect. What the local conditions are that determined the increased mortality in the North-Western and Western Hospitals, especially in the former, it is difficult to decide; but it would be as absurd for those who advocate the use of antitoxin to take the figures of the South-Eastern Hospital alone, where the fall is from 31·5 to 14·6 per cent., as being typical and in support of their thesis, as it is to take the other figures to prove that antitoxic serum is worse than useless. Where so many personal and local factors come into an equation it is essential that the whole of the cases and the whole of the hospitals should be considered, as they have been in former years. Only thus are statistics which are at all comparable with the statistics contained in the earlier Reports to be obtained.

Effect of repeated injections.

Effect of repeated injections in cases of true diphtheria.

In cases in which no diphtheria bacilli were found.

Coming now to those cases (Table XCIX.) which from their clinical aspect alone were classified as cases of true diphtheria and that were treated with antitoxic serum, we find that the percentage death-rate is much higher where the stronger than where the weaker serum was used. No diphtheria bacilli were found in any of these cases, and it must be borne in mind that the more potent serum only came into use during the last four months of the year, when the physicians in charge were coming to place more reliance on the bacteriological diagnosis in those cases in which no diphtheria bacilli were found; for we find that during the earlier part of the year there were 241 cases, with only 37 deaths—a mortality of 15·3 per cent. In most instances these cases must have been suffering from diphtheria of a comparatively mild type, or from tonsillitis, ulcerated sore throat, and other similar conditions, and diphtheria bacilli could not be found; in these cases the tendency would certainly be, until wider experience had been obtained of the bacteriological examination, to look upon all doubtful cases of diphtheria as coming under the class of cases in which there was a necessity for the injection of antitoxin, and of course a large proportion of these cases were put down as being diphtheritic if there was any doubt at all upon the point. In the later months of the year, however, the absence of diphtheria bacilli in the doubtful cases would be looked upon as confirmatory evidence of the clinical diagnosis, and as clearing up doubts as regards diagnosis, and it would only be in those cases in which the clinical evidence was definite that the bacteriological diagnosis would be set on one side and the treatment with antitoxin resorted to. Such cases, of course, would in most instances be of a comparatively severe type, and it is not surprising, therefore, to find that the percentage mortality in this type of case is within a decimal point of that amongst the cases in which the clinical and bacteriological diagnoses agreed—strong evidence that these cases were in all probability cases of true diphtheria, although no diphtheria bacilli could be demonstrated in the material taken from the mucous membrane of the throat or fauces.

Doubtful cases in which antitoxin given, usually of a severe type.

Further, it will be noted, on comparing the two 1895 tables (Tables XCVIII. and XCIX.) with the corresponding tables for 1896 (Tables C. and CI.), that amongst those cases in which diphtheria bacilli were found the death-rate has now fallen still lower—from 27·7 to 22·2—whilst amongst the cases in which diphtheria bacilli were not found we have again almost exactly the same proportion of deaths that we had amongst the cases in which diphtheria bacilli were not found in 1895, and which were treated with stronger serum; the mortality under this heading being again only a decimal point—0·7—below the percentage mortality of those cases in which diphtheria bacilli were found and which were treated with antitoxin. These figures bear out in a most remarkable manner the suggestions and contentions put forward, in connection with Table XCIX., as regards the different character of the cases in the earlier and later parts of the year 1895; and there can be little doubt that the majority of the 417 cases treated as being cases of true diphtheria, although

TABLE XCVIII.—Showing number of Injections of Antitoxic Serum into cases in which the presence of Diphtheria bacilli was demonstrated. The numbers of Cases and Deaths, and the percentage Mortality, are given in connection with each form of serum.

1895.

Number of Injections ... Hospitals.	1 Cases.	1 Deaths.	1 Mortality per Cent.	2 Cases.	2 Deaths.	2 Mortality per Cent.	3 Cases.	3 Deaths.	3 Mortality per Cent.	4 Cases.	4 Deaths.	4 Mortality per Cent.	5 Cases.	5 Deaths.	5 Mortality per Cent.
Fountain.															
Other Serum	52	15	28·8	44	11	25·0	10	4	40·0	1	1	100·0	...	...	...
Laboratories' Serum ..	74	5	6·7	52	14	26·9	29	14	48·2	18	7	38·8	3	2	66·6
Total	126	20	15·8	96	25	26·04	39	18	46·1	19	8	42·1	3	2	66·6
Western.															
Other Serum	119	29	24·3	57	9	15·7	26	9	34·6	18	7	38·8	...	...	...
Laboratories' Serum .	60	4	6·6	50	12	24·0	28	10	35·7	26	12	46·1	13	8	61·5
Total	179	33	18·4	107	21	19·6	54	19	35·1	44	19	43·1	13	8	61·5
Eastern.															
Other Serum	71	22	30·9	40	8	20·0	45	23	51·1	7	6	85·7	...	...	...
Laboratories' Serum ...	38	7	18·4	52	12	23·07	20	8	40·0	9	4	44·4	16	8	50·0
Total	109	29	26·6	92	20	21·7	65	31	47·6	16	10	62·5	16	8	50·0
South-Eastern.															
Other Serum	47	24	51·06	174	46	26·4	...	...	...	1	0	0·0	...	...	...
Laboratories' Serum ...	28	9	32·1	160	18	11·2	9	2	22·2	1	0	0·0	...	...	...
Total	75	33	44·0	334	64	19·1	9	2	22·2	2	0	0·0	...	...	...
South-Western.															
Other Serum	18	3	16·6	54	15	27·7	49	19	38·7	6	2	33·3	4	3	75·0
Laboratories' Serum ...	5	3	60·0	10	2	20·0	24	5	20·8	21	3	14·2	23	7	30·4
Total	23	6	26·08	64	17	26·5	73	24	32·8	27	5	18·5	27	10	37·03
North-Western.															
Other Serum	119	17	14·2	44	22	50·0	11	7	63·6	1	1	100·0	1	1	100·0
Laboratories' Serum ..	52	14	26·9	29	15	51·7	11	5	45·4	5	4	80·0	...	...	...
Total	171	31	18·1	73	37	50·6	22	12	54·5	6	5	83·3	1	1	100·0
Northern.															
Other Serum	13	0	0·0	6	1	16·6	1	0	0·0	...	...	...	...	...	...
Laboratories' Serum ...	34	3	8·8	15	1	6·6	...	...	...	...	...	...	...	...	...
Total	47	3	6·3	21	2	9·5	1	0	0·0	...	...	...	...	...	...
Total.															
Other Serum	439	110	25·05	419	112	26·7	142	62	43·6	34	17	50·0	5	4	80·0
Laboratories' Serum ...	291	45	15·4	368	74	20·1	121	44	36·3	80	30	37·5	55	25	45·4
Total	730	155	21·2	787	186	23·6	263	106	41·2	114	47	41·2	60	29	48·3

Number of Injections ... Hospitals.	6 Cases.	6 Deaths.	6 Mortality per Cent.	7 Cases.	7 Deaths.	7 Mortality per Cent.	8 Cases.	8 Deaths.	8 Mortality per Cent.	9 Cases.	9 Deaths.	9 Mortality per Cent.	10 Cases.	10 Deaths.	10 Mortality per Cent.	11 Cases.	11 Deaths.	11 Mortality per Cent.	12 Cases.	12 Deaths.	12 Mortality per Cent.
Fountain.																					
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laboratories' Serum ..	2	1	50·0	1	0	0·0	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...
Total	2	1	50·0	1	0	0·0	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...
Western.																					
Other Serum	...	...	...	1	1	100·0	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...
Laboratories' Serum .	8	6	75·0	5	4	80·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	8	6	75·0	6	5	83·3	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...
Eastern.																					
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laboratories' Serum ...	3	3	100·0	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	3	3	100·0	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South-Eastern.																					
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laboratories' Serum ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South-Western.																					
Other Serum	8	1	12·5	6	2	33·3	2	1	50·0	3	3	100·0	...	...	...	...	...	...	...	...	...
Laboratories' Serum ...	19	3	15·7	15	5	33·3	7	4	57·1	9	3	33·3	6	3	50·0	5	1	20·0	1	0	0·0
Total	27	4	14·8	21	7	33·3	9	5	...	12	6	50·0	6	3	50·0	5	1	20·0	1	0	0·0
North-Western.																					
Other Serum	...	...	...	...	...	...	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...
Laboratories' Serum ..	...	...	...	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	1	1	100·0	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...
Northern.																					
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laboratories' Serum ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total.																					
Other Serum	8	1	12·5	7	3	42·8	4	3	75·0	3	3	100·0	...	...	...	...	...	...	...	...	...
Laboratories' Serum ...	32	13	40·6	23	11	47·8	8	5	62·5	9	3	33·3	6	3	50·0	5	1	20·0	1	0	0·0
Total	40	14	35·0	30	14	46·6	12	8	66·6	12	6	50·0	6	3	50·0	5	1	20·0	1	0	0·0

Number of Injections ... Hospitals.	13 Cases.	13 Deaths.	13 Mortality per Cent.	17 Cases.	17 Deaths.	17 Mortality per Cent.	18 Cases.	18 Deaths.	18 Mortality per Cent.	27 Cases.	27 Deaths.	27 Mortality per Cent.	Total Cases.	Total Deaths.	Total Mortality per Cent.
Fountain.															
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	107	31	28·9
Laboratories' Serum ..	...	...	...	...	...	...	...	...	...	...	...	...	180	44	24·4
Total	...	...	...	...	...	...	...	...	...	...	...	...	287	75	26·1
Western.															
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	222	56	25·2
Laboratories' Serum .	...	...	...	...	...	...	...	...	...	...	...	...	190	56	29·4
Total	...	...	...	...	...	...	...	...	...	...	...	...	412	112	27·1
Eastern.															
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	163	59	36·1
Laboratories' Serum ...	...	...	...	...	...	...	...	...	...	...	...	...	139	43	30·9
Total	...	...	...	...	...	...	...	...	...	...	...	...	302	102	33·7
South-Eastern.															
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	222	70	31·5
Laboratories' Serum ...	...	...	...	...	...	...	...	...	...	...	...	...	198	29	14·6
Total	...	...	...	...	...	...	...	...	...	...	...	...	420	99	23·5
South-Western.															
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	150	49	32·6
Laboratories' Serum ...	4	2	50·0	1	0	...	2	1	50·0	1	1	100·0	153	43	28·1
Total	4	2	50·0	1	0	...	2	1	50·0	1	1	100·0	303	92	30·3
North-Western.															
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	177	49	27·6
Laboratories' Serum ..	...	...	...	...	...	...	...	...	...	...	...	...	98	39	39·7
Total	...	...	...	...	...	...	...	...	...	...	...	...	275	88	32·0
Northern.															
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	20	1	5·0
Laboratories' Serum ...	...	...	...	...	...	...	...	...	...	...	...	...	49	4	8·1
Total	...	...	...	...	...	...	...	...	...	...	...	...	69	5	7·2
Total.															
Other Serum	...	...	...	...	...	...	...	...	...	...	...	...	1,061	315	29·6
Laboratories' Serum ...	4	2	50·0	1	0	0·0	2	1	50·0	1	1	100·0	1,007	258	25·6
Total	4	2	50·0	1	0	0·0	2	1	50·0	1	1	100·0	2,068	573	27·7

TABLE XCIX.—Showing number of Injections of Antitoxic Serum into cases in which the presence of Diphtheria bacilli could not be demonstrated. The numbers of Cases and Deaths, and the percentage Mortality are given in connection with each form of serum.

1895.

Number of Injections ...	1			2			3			4			5			6			7			12			Total.		
HOSPITALS.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.
Fountain.																											
Other Serum	12	2	16·6	5	0	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17	2	11·7
Laboratories' Serum ...	5	1	20·0	2	1	50·0	2	1	50·0	1	0	0·0	...	...	...	...	...	...	...	...	...	...	...	...	10	3	30·0
Total ...	17	3	17·6	7	1	14·2	2	1	50·0	1	0	0·0	...	...	...	...	...	...	...	...	...	...	...	...	27	5	18·5
Western.																											
Other Serum	45	2	4·4	11	1	9·09	1	0	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	57	3	5·2
Laboratories' Serum ...	5	1	20·0	6	1	16·6	2	1	50·0	2	0	0·0	...	...	...	...	...	...	1	1	100·0	...	...	...	16	4	25·0
Total ...	50	3	6·0	17	2	11·7	3	1	33·3	2	0	0·0	...	...	...	...	...	...	1	1	100·0	...	...	...	73	7	9·5
Eastern.																											
Other Serum	31	4	12·9	7	3	42·8	7	5	71·4	1	0	0·0	1	1	100·0	1	0	0·0	...	...	...	...	...	...	48	13	27·08
Laboratories' Serum ...	4	3	75·0	6	2	33·3	1	0	0·0	2	1	50·0	...	...	...	...	...	...	...	...	...	...	...	...	13	6	46·1
Total ...	35	7	20·0	13	5	38·4	8	5	62·5	3	1	33·3	1	1	100·0	1	0	0·0	...	...	...	...	...	...	61	19	31·1
South-Eastern																											
Other Serum	19	0	0·0	40	2	5·0	1	0	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	60	2	3·3
Laboratories' Serum ..	15	2	13·3	14	2	14·2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29	4	13·7
Total ...	34	2	5·8	54	4	7·4	1	0	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	89	6	6·7
South-Western.																											
Other Serum	6	2	33·3	6	1	16·6	5	1	20·0	2	2	100·0	2	1	50·0	...	...	...	...	...	...	...	...	...	21	7	33·3
Laboratories' Serum ...	3	0	0·0	2	0	0·0	5	1	20·0	3	1	33·3	1	0	0·0	1	1	100·0	2	0	0·0	1	1	100·0	18	4	22·2
Total ...	9	2	22·2	8	1	12·5	10	2	20·0	5	3	60·0	3	1	33·3	1	1	100·0	2	0	0·0	1	1	100·0	39	11	28·2
North-Western.																											
Other Serum	32	8	25·0	3	1	33·3	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	36	10	27·7
Laboratories' Serum ...	2	1	50·0	3	1	33·3	...	...	...	...	...	...	...	...	...	...	...	...	1	1	100·0	...	...	...	6	3	50·0
Total ..	34	9	26·4	6	2	33·3	1	1	100·0	...	...	...	...	...	...	...	...	...	1	1	100·0	...	...	...	42	13	30·9
Northern.																											
Other Serum	...	...	...	2	0	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	0	0·0
Laboratories' Serum ...	1	0	0·0	1	0	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	0	0·0
Total ...	1	0	0·0	3	0	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	0	0·0
Total.																											
Other Serum	145	18	12·4	74	8	10·8	15	7	46·6	3	2	66·6	3	2	66·6	1	0	0·0	...	...	...	...	...	...	241	37	15·3
Laboratories' Serum ..	35	8	22·8	34	7	20·5	10	3	30·0	8	2	25·0	1	0	0·0	1	1	100·0	4	2	50·0	1	1	100·0	94	24	25·5
Total ...	180	26	14·4	108	15	13·8	25	10	40·0	11	4	36·3	4	2	50·0	2	1	50·0	4	2	50·0	1	1	100·0	335	61	18·2

TABLE C.—Showing number of Injections of Antitoxic Serum into cases in which the presence of Diphtheria bacilli was demonstrated. The numbers of Cases and Deaths and the percentage Mortality, are also given.

1896.

Number of Injections ...	1			2			3			4			5			6		
HOSPITALS.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.
Fountain Laboratories' Serum	143	15	10·4	212	34	16·03	148	40	27·02	71	27	38·02	45	18	40·0	13	8	61·5
Western ,,	181	20	11·04	178	35	19·6	134	48	35·8	72	24	33·3	24	15	62·5	10	6	60·0
Eastern ,,	166	17	10·2	151	21	13·9	85	21	24·7	51	19	37·2	23	7	30·4	9	6	66·6
South-Eastern ,,	219	42	19·1	250	54	21·6	28	10	35·7	12	5	41·6	...	...	...	...	...	...
South-Western ,,	41	8	19·5	47	7	14·8	56	9	16·07	77	14	18·1	46	17	36·9	26	7	26·9
North-Western ,,	270	75	27·7	33	13	39·3	26	14	53·8	9	8	88·8	6	5	83·3	5	3	60·0
North-Eastern ,,	6	1	16·6	5	3	60·0	6	3	50·0	1	0	0·0	...	...	...	...	...	...
Brook ,,	48	8	16·6	62	5	8·06	30	10	33·3	22	11	50·0	6	4	66·6	2	1	50·0
Northern ,,	78	0	0·0	89	1	1·1	9	1	11·1	3	1	33·3	...	...	...	...	...	...
Gore Farm ,,	16	0	0·0	28	0	0·0	6	0	0·0	4	0	0·0	2	0	0·0	1	0	0·0

Number of Injections ...	7			8			9			10			11			12			Total.		
HOSPITALS.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality Per Cent.	Cases.	Deaths.	Mortality per Cent.
Fountain Laboratories' Serum	6	3	50·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	638	145	22·7
Western ,,	7	4	57·1	...	...	...	1	0	0·0	2	0	0·0	1	1	100·0	3	1	33·3	613	154	25·1
Eastern ,,	4	2	50·0	2	1	50·0	...	...	...	...	...	...	...	...	...	...	...	...	491	91	19·1
South-Eastern ,,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	509	111	21·8
South-Western ,,	7	1	14·2	7	4	57·1	2	1	50·0	1	1	100·0	...	...	...	1	0	0·0	311	69	22·1
North-Western ,,	3	1	33·3	1	1	100·0	...	...	...	1	1	100·0	...	...	...	...	...	...	354	121	34·1
North-Eastern ,,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	7	38·8
Brook ,,	1	1	100·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	171	40	23·3
Northern ,,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	179	3	1·6
Gore Farm ,,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	57	0	0·0

no diphtheria bacilli were found in them, were really cases of true diphtheria, and were diagnosed as such through the clinical symptoms, and that the bacteriological diagnosis was at fault. However, as the diagnosis was made clinically, the failure of the bacteriological diagnosis is of less importance; and as the possibility of failure, owing to the various causes already mentioned, must be carefully borne in mind, and as this failure occurs in such a small proportion of the cases, the matter is of less importance than would at first sight appear.

In Table C. are given the 1896 cases in which diphtheria bacilli were found, and which on one or more occasions were injected with antitoxin. It is interesting to notice that with the gradual rise in the number of injections there is a more or less marked rise in the percentage mortality—a fact, no doubt, that was at one time seized upon by the opponents of antitoxin as evidence of the uselessness of this therapeutic agent. On a careful comparison of the figures however, it will at once be seen that one or two injections are as a rule sufficient to cure the majority of all but very severe and long-standing cases of diphtheria, and that the mortality is higher when numerous injections are given because the cases are more severe or have been brought under treatment at a late stage of the disease. There can be no doubt that under the old method of treatment many of the fatal cases would have succumbed at a much earlier period of the disease, whilst many of those that eventually recovered would have died. Taking the Fountain Hospital, for instance—which may be looked upon as a fairly typical hospital—we find that of 143 patients who received one injection only, 10·5 per cent. died; of 212 patients who received two injections, 16·03 died; of 148 that received three injections, 27·02 died; and then after this there is a gradual rise in a small number of cases to a percentage death-rate of 61·5 in those cases injected four, five, and six times, followed (as might be expected in patients who had battled on so long) by a slight fall on a very small number of cases that received seven injections. In the North-Western Hospital, in which the percentage mortality of the cases receiving one injection was 28 on 270 cases, we find that here again there is the same progressive mortality up to the fourth injection—88·8 per cent.—but the numbers are again comparatively small, so that these high percentages do not exert such a marked influence on the total percentage death-rate as might be anticipated. At the Northern Hospital most of the cases were treated with one or two injections. Of those that received one injection—only 78 in number—not a single one died, whilst of those that received two injections one out of 89 died, or only 1·12 per cent. These cases, however, it will be remembered, like those at the Gore Farm Hospital, almost invariably came under treatment on the first day of the disease.

Cases of diphtheria treated with antitoxin in 1896.

Cases that recovered would have died in pre-antitoxin period.

Table CI. shows the number of cases in which no diphtheria bacilli were found, which, however, from the clinical appearances, it was considered necessary to treat as cases of true diphtheria and to inject antitoxin. As we have already seen, the death-rate in this class of case is almost exactly the same as that where diphtheria bacilli were demonstrated; so that we must look upon these as diphtheria cases in which, owing to some imperfection in the method of collecting or examining the material from the throat, no diphtheria bacilli were found, although the case, from the clinical symptoms and subsequent history, was undoubtedly one of diphtheria. It is interesting to notice in this series that, although there is a general rise in the percentage mortality amongst those cases in which antitoxin is given on more than one occasion, there are several instances in which this rule is departed from. For instance, although the percentage death-rate on the whole of the cases in which one injection was given is 17·7 on 203 cases, and 25·7 on 136 cases where two injections were given, it falls to 11·3 per cent. in 44 cases where three injections were given; though after this there are again series of 26·3 per cent. on 19 cases where four injections were given, and of 70 per cent. on 10 cases where five injections were given.

TABLE CI.—Showing number of Injections of Antitoxic Serum into cases in which the presence of Diphtheria bacilli could not be demonstrated. The numbers of Cases and Deaths and the percentage Mortality, are also given.

1896.

Number of Injections ...	1			2			3			4			5			6			Total.		
Hospitals.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.	Cases.	Deaths.	Mortality per Cent.
Fountain Laboratories' Serum	28	4	14·2	37	16	43·2	14	1	7·1	5	2	40·0	2	1	50·0	1	0	0·0	87	24	27·5
Western ,,	36	4	11·1	17	4	23·5	9	1	11·1	4	2	50·0	2	2	100·0	1	1	100·0	69	14	20·2
Eastern ,,	23	5	21·7	19	4	21·04	9	0	0·0	2	0	0·0	2	1	50·0	0	0	0·0	55	10	18·1
South-Eastern ,,	51	12	23·5	28	6	21·4	2	1	50·0	3	1	33·3	...	...	...	...	...	...	84	20	23·8
South-Western ,,	7	0	0·0	4	1	25·0	2	0	0·0	2	0	0·0	3	2	66·6	1	1	100·0	19	4	21·05
North-Western ,,	34	8	23·5	5	3	60·0	1	0	0·0	...	...	...	1	1	100·0	1	0	0·0	42	12	28·5
North-Eastern ,,	3	2	66·6	2	0	0·0	...	...	...	...	...	...	...	...	...	1	0	0·0	6	2	33·3
Brook ,,	7	0	0·0	5	1	20·0	4	2	50·0	1	0	0·0	0	0	0·0	0	0	0·0	17	3	17·6
Northern ,,	12	1	8·3	12	0	0·0	2	0	0·0	1	0	0·0	...	...	...	...	...	...	27	1	3·7
Gore Farm ,,	2	0	0·0	7	0	0·0	1	0	0·0	1	0	0·0	...	...	...	...	...	...	11	0	0·0
Total	203	36	17·7	136	35	25·7	44	5	11·3	19	5	26·3	10	7	70·0	5	2	40·0	417	90	21·5

If the figures in this table be subtracted from the total "negative" cases examined, we have, approximately, the percentage of cases that were sent in as cases of diphtheria, but which, in all probability, were not suffering from this disease at all; the bacteriological examination eliminating a certain large proportion of the true cases, whilst the clinical evidence—of such a character that the physicians in charge thought it necessary to inject antitoxin—eliminates the remainder—417. Taking the whole number of cases—6,832—we find that diphtheria bacilli were found in 5,068 cases, but were not found in 1,764. Of these 1,764 cases, however, 417 were treated with antitoxin, and must, therefore, be looked upon as having given undoubted clinical evidence of the disease, so that these may be added to the 5,068 positive cases; leaving 1,347 cases which, although they had been certified as cases of diphtheria, showed neither clinical nor bacteriological evidence that they were cases of this disease. The percentage of deaths amongst these cases of diphtheria—5,485 in number, with 830 deaths—is 15·1, whilst the percentage of deaths amongst those cases in which we have no evidence of diphtheria—1,347, with 97 deaths—is 7·2. It must be borne in mind, however, that a certain number of cases in which there has been no observed evidence, either clinical or bacteriological, must undoubtedly have been cases of diphtheria before they were admitted to hospital, and it is probable that to this series of cases a considerable part of the mortality—7·2 per cent.—must be attributed; if these could be eliminated the death-rate would be very low indeed. At the same time one cannot help thinking, bearing in mind the evidence here adduced, that if these cases had been injected before they were admitted to hospital, the death-rate would have been still further reduced.

Proportion of notified cases not cases of diphtheria.

Injected cases in which no diphtheria bacilli could be found.

In Table XCII. are given the figures for 1895 of those cases only in which, although no diphtheria bacilli could be demonstrated, antitoxic serum was injected. Here the cases are arranged in exactly the same way as in Table LXXXVIII., but are from a larger number of hospitals. The chief interest of these figures lies in the fact that the mortality in this class of case differs so enormously in the different hospitals, ranging from 3·3 per cent. at the South-Eastern Hospital, where only 2 cases out of 60 died, to 33·3 per cent. at the South-Western, where 7 cases out of 21 died. The Northern Hospital is omitted for the reason that only 2 cases were treated, both of which recovered. In this table the antitoxic serum is represented in c.c. Here, again, in order to obtain the calculated number of units, all that is necessary is to multiply the number of c.c. by 20, so that any figure may thus be converted into units. The antitoxin used was from various sources, but none of it was obtained from the laboratories of the Royal Colleges.

In Table XCI. are given similar figures for cases in which no diphtheria bacilli were found which were treated with antitoxic serum obtained from the laboratories, the only difference in form of statement being that in place of the *amount* of serum the *number of units* contained in the serum is given. It will be noticed that the larger the percentage of cases treated during the early stage of the disease the lower is the death-rate, especially when, along with this, a comparatively large dose of antitoxin is injected at this early period. In all the hospitals where the mortality is high the treatment is commenced after the third day of the disease, and the greater the proportion of the cases treated after this period the higher is the mortality.

Late treatment—increased mortality.

Coming now to the cases in which serum not obtained from the laboratories was used in the treatment of cases of diphtheria in which the specific bacilli were found (Table XC.), the percentage mortality is much more constant, even at the different hospitals. It ranges between 27·6 at the North-Western Hospital and 36·1 at the Eastern Hospital, on the one hand, to 5 per cent. at the Northern Hospital, where all the cases were treated on the first day; the mortality on the whole of the cases, as we have already seen, being 29·6. The average amount of antitoxin given was 33·9 c.c., or about 660 units per case; the amount given at the different hospitals varying from 350 units at the Northern Hospital to 960 at the South-Western Hospital. Taking these two extremes, we find that these same two hospitals are also at the extremes of the percentage mortality table; and if these figures were taken alone and none of the conditions examined into, it might be suggested that the use of antitoxin in large quantities appears to be unattended with good results, and that the antitoxin might actually be injurious. We find, however, that all the cases at the Northern Hospital were treated as soon as the disease was recognised—that is, as soon as it was known that diphtheria bacilli were present; whilst at the South-Western Hospital a very large proportion of the cases were treated after the third day of the disease, the mortality amongst these cases being very high indeed, although the mortality amongst the cases which came under treatment on the first day was 0·0 per cent., up to the second day 13·4 per cent., and up to the third day 21·8 per cent., as against 32·6 per cent. on the whole; so that for cases treated after the third day the mortality was 38·9 per cent. This holds good throughout the table. The rapid rise on the third day we think also indicates that the antitoxin of weak unit-contents was not so useful for treatment of the more advanced cases as the stronger serum, although comparatively good results could always be obtained with it when the cases came under treatment on the first and second days of the disease. These figures, then, confirm in a most remarkable manner Behring's contention that as the disease advances it requires for its successful treatment a proportionately much larger number of units than during the earlier stages.

Early treatment—mortality slight.

Potent antitoxic serum necessary in later stages of disease.

Of the similar cases treated with antitoxin supplied by the laboratories we find a record in Table LXXXIX., in which the only difference is that here the antitoxic value of the serum is given in units and not in bulk of serum. Taking the two extremes again, we find that at the South-Eastern Hospital the mortality is only 14·6 per cent., whilst at the North-Western—the other extreme—we have a mortality of 39·7 per cent. If we again take the mortality on the first, second, and third days, we find that at the South-Eastern Hospital it is 0·0 per cent. for the first day, including the cases in which onset was in hospital, for the second day 6·2 per cent., for the third day 10·1 per cent., whilst cases treated after the third day were accompanied by a mortality of 18·4 per cent. At the North-Western Hospital the mortality of cases treated on the first day—only one case—was 0·0 per cent., on the second 24·4, on the third day 38·8, and after the third day 40·3 per cent.; the mortality being especially high in those cases in which the antitoxin injection was commenced on the fourth, fifth, or sixth days. It will be noted too, that at the two hospitals there was a marked difference in the amount of antitoxin given on the first, second, third, fourth, fifth, and sixth days, the larger quantity always being given at the South-Eastern Hospital; though in neither of these hospitals was the amount given quite up to the average—1,273 units per case at the North-Western and 1,817 at the South-Eastern, as against 1,981 over the whole of the hospitals.

In 1896, where a larger number of units of antitoxic serum was injected there is on the whole a very considerable fall in the percentage mortality, and it is interesting to follow in some detail the death-rates in the different hospitals. At the two convalescent hospitals—the Northern and the Gore Farm—where cases of diphtheria came under treatment immediately, it is found that the percentage death-rate is very low indeed. Taking first the cases in which diphtheria bacilli could be demonstrated, we find that at the Gore Farm there were 57 cases injected (Tables C. and XCVI.), all of them on the first day, and amongst these cases not a single death occurred. At the Northern Hospital, where similar conditions obtain, there were 179 cases—probably, of course, as in the case of the Gore Farm, patients who had been treated in the hospital for some other disease and were now convalescent—with only three deaths. Although it is necessary to include these three deaths, I am informed that in at least two of the cases the death should be attributed to complicating conditions associated as much with the primary disease—scarlet fever, &c.—as with diphtheria. We have here, then, a mortality, assuming that the diphtheria was the cause of death in these cases, of only 1·6 per cent.—an extraordinarily low death-rate when the former mortality amongst post-scarlatinal diphtheria cases is taken into consideration. Now, taking the highest percentage mortality in this table (which, however, occurred over a small number of cases only—18—at the North-Eastern Hospital), none of the cases are put down as being injected before the seventh day, though in 13 of these the onset of the disease took place in hospital. Amongst these the death-rate was 30·6 per cent.—4 deaths in 13 cases—and in all probability some of these cases, at any rate, were injected comparatively early. Of the 5 cases injected on the seventh day or afterwards, 3 died. In the hospital in which the mortality was highest—34·1 per cent.—only 6 out of 354 cases were injected on the first day of the disease, 42 on the second day of the disease, and 62 on the third day; all the remainder were injected after the third day of the disease. These proportions do not hold good absolutely throughout the various hospitals, but it will be observed that, as a general rule, the greater the proportion of cases treated before the periods mentioned—that is, before the end of the third day—in any hospital, the lower is the percentage mortality.

Low mortality amongst cases suffering from diphtheria contracted in hospital.

In Table CI. is given a similar record of those cases which, although diphtheria bacilli were not found, still presented such evident clinical signs of diphtheria that it was thought advisable to inject them with antitoxin. Here the figures at the Gore Farm and Northern Hospitals are again the lowest. There were 11 cases at the Gore Farm, all of which were injected on the first day, and amongst them there was not one death, so that in this hospital in 1896 we have a record of 68 injected cases without a single death. At the Northern Hospital we have 206 cases, with 4 deaths—a mortality of 1·9 per cent. At the North-Eastern Hospital again the death-rate on a small number of cases is the highest in the list; but where larger numbers were treated the North-Western Hospital has again the highest percentage mortality—28·5 on 42 cases. It is closely followed by the Fountain Hospital, in which the percentage mortality is 27·5 on 87 cases. Here again it will be noted, especially on looking over the totals, that the mortality amongst cases first injected on the first and second days of the disease is very low indeed; whilst of those treated first on the third, fourth, and fifth days it has gone up decidedly, but is still not so high as it becomes for the sixth day and later.

It should be noted in all these tables that those figures headed "Onset in Hospital" might really be included under cases injected on the first or second day; and it will be observed that, with one or two exceptions, the mortality amongst this class of case is very low indeed. In Table XCIII. there are shown 17 deaths in 138 such cases, and in Table XCIV. 2 deaths in 14 cases, or percentages of 12·3 and 14·28 respectively.

TABLE CII.—Hospitals in order of Percentage Mortality in pre-antitoxin year, 1894.

Northern	45·1 per cent.	South-Eastern ...	29·7 per cent.
Western	37·1 ,,	South-Western ...	28·5 ,,
Eastern	30·0 ,,	North-Western ...	26·9 ,,

Hospitals in order of Percentage Mortality in last antitoxin year, 1896.

North-Western ...	33·5 per cent.	South-Eastern ...	22·09 per cent.
Western	24·6 ,,	Eastern	19·0 ,,
South-Western ...	22·1 ,,	Northern	1·94 ,,

Taking the general results of these various sets of tables, we find that in 1895, amongst cases of undoubted diphtheria injected with antitoxin—2,403 in number—there were 634 deaths, or 26·38 per cent.; in 1896 834 cases died out of 3,758 cases, this giving a mortality of 22·19 per cent. Assuming that the mortality in 1896 had been as high as that in 1895, over 157 more cases would have died, so that amongst these cases alone there may be said to have been a further actual saving of that number of lives as between the two years; and comparing these figures with earlier years, the saving of life is enormously greater, as may be found on referring to the Reports of the Medical Superintendents of the various hospitals under the Board. The great value of the figures given in this Report for the two years 1895 and 1896 is that they are in most respects actually comparable, and form a basis of comparison not only for the whole of the cases treated in hospital, but for those injected with antitoxin, for those uninjected, for those in which diphtheria bacilli were present, and for those in which clinical features only were relied upon as the basis of the diagnosis. Most of all the really doubtful cases have thus been eliminated, and cases which

Reduction in percentage mortality going on steadily.

Effect on statistics of eliminating cases of throat mischief formerly supposed to be diphtheritic.

in certain hospitals would in former years have been included in the diphtheria statistics, have been carefully excluded, which has naturally the effect of making the death-rate appear relatively higher than it was in former years; but in spite of this the fall has been exceedingly well marked. This is an exceedingly interesting feature in these tables, as it will be found, on comparing the statistics of the various hospitals, that the fall in percentage mortality in certain hospitals has been much less marked than in others. On *a priori* grounds, and looking simply at the tables in this Report, and taking these facts into consideration, one would expect to find an exact reversal of the mortalities under the old system and under the new. Taking the two extremes, this holds absolutely, for we find that under the old method of diagnosis and classification the Northern Hospital (Table CII.) stands at the head of the percentage mortality with 45·1 per cent., whilst under the new system of classification and diagnosis the mortality has sunk to the low point of 1·94 per cent. At the other extreme we have the North-Western Hospital, which, when all cases were included, had a mortality of only 26·9 per cent.—the lowest on the list of the hospitals in which the two periods can be compared —whilst under the new classification the mortality is 33·5 per cent. The other hospitals follow exactly the same rule, with the exception of the Western, which in earlier years had the highest mortality next to the Northern Hospital, a position it still retains—now, of course, following the North-Western—but here the mortality has fallen from 37·1 to 24·6 per cent.; so that of the whole of the hospitals which can in any way be compared in the two periods, there is only one in which there is an actual rise in the percentage mortality, and in this case the rise is from 26·9 to 33·5. It may be that at this hospital the cases are necessarily admitted at a later stage of the disease, that the type of diphtheria in the districts which this hospital serves is of a more severe character, and that in earlier years cases which now would not be looked upon as cases of true diphtheria were looked upon as being diphtheritic and were included in the statistics. This must account for the lower mortality in the earlier periods, but it cannot account for the very high mortality of 1896, which must be set down to the large proportion of cases (as compared with the general average) that came under treatment at a late stage of the disease.

Number of injections, and the period at which they were given.

In Tables CIII. to CIX. are set forth the number of injections given at each hospital, the number of patients, and the average number of injections per patient. It will be seen that these vary very greatly indeed—far more, as we shall afterwards see, than do the quantity and number of units in the same hospitals. It is evident, therefore, that the quantity used at each injection must have varied, rather than the total number of units given to each patient. For example, taking the Fountain Hospital and the North-Western in 1895, in Table CV. we find that at the North-Western the average number of injections per patient was 1·7, and at the Fountain 2·1, whilst

Table CIII.—Showing number of Injected Cases in which the presence of Diphtheria bacilli could be demonstrated, and the average number of Injections per case treated with serum from outside sources.

1894.

Number of Injections / Hospitals.	1	2	3	4	Total Injections.	Number of Patients.	Average Number of Injections per Patient.
Fountain ...	1	2	2	...	11	5	2·2
Eastern	...	...	...	1	4	1	4·0
South-Eastern ...	4	14	...	...	32	18	1·7
Total ...	5	16	2	1	47	24	1·9

Table CIV.—Showing number of Injected Cases in which the presence of Diphtheria bacilli could be demonstrated, and the average number of Injections per case treated with serum from outside sources.

1895.

Number of Injections / Hospitals.	1	2	3	4	5	6	7	8	9	Total Injections.	Number of Patients.	Average Number of Injections per Patient.
Fountain ...	52	44	10	1	...	...	...	...	...	174	107	1·6
Western ...	119	57	26	18	...	...	1	1	...	398	222	1·7
Eastern ...	71	40	45	7	...	...	...	...	...	314	163	1·9
South-Eastern ...	47	174	...	1	..	...	...	...	...	399	222	1·7
South-Western	18	54	49	6	4	8	6	2	3	450	150	3·0
North-Western	119	44	11	1	1	...	...	1	...	257	177	1·4
Northern ...	13	6	1	...	...	...	...	...	...	28	20	1·4
Total ...	439	419	142	34	5	8	7	4	3	2,020	1,061	1·9

Table CV.—Showing number of Injected Cases in which the presence of Diphtheria bacilli could be demonstrated, and the average number of Injections per case treated with serum from the Laboratories.

1895.

Number of Injections ... / Hospitals.	1	2	3	4	5	6	7	8	9	10	11	12	13	17	18	27	Total Injections.	Number of Patients.	Average Number of Injections per Patient.
Fountain	74	52	29	18	3	2	1	1	...	...	...	...	...	...	...	...	379	180	2·1
Western	60	50	28	26	13	8	5	...	...	...	...	...	...	...	...	...	496	190	2·6
Eastern	38	52	20	9	16	3	1	...	...	...	...	...	...	...	...	...	343	139	2·4
South-Eastern	28	160	9	1	...	...	...	...	...	...	...	...	...	...	...	...	379	198	1·9
South-Western	5	10	24	21	23	19	15	7	9	6	5	1	4	1	2	1	911	153	5·9
North-Western	52	29	11	5	...	...	1	...	...	...	...	...	...	...	...	...	170	98	1·7
Northern	34	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	64	49	1·3
Total	291	368	121	80	55	32	23	8	9	6	5	1	4	1	2	1	2,742	1,007	2·7

TABLE CVI.—Showing number of Injected Cases in which the presence of Diphtheria bacilli could be demonstrated, and the average number of Injections per case treated with serum from the Laboratories.

1896.

Number of Injections ... / HOSPITALS.	1	2	3	4	5	6	7	8	9	10	11	12	Total Injections.	Number of Patients.	Average No. of Injections per Patient.
Fountain...	143	212	148	71	45	13	6	...	...	...	...	...	1,640	638	2·5
Western	181	178	134	72	24	10	7	...	1	2	1	3	1,532	613	2·4
Eastern	166	151	85	51	23	9	4	2	...	...	...	...	1,140	491	2·3
South-Eastern	219	250	28	12	...	...	...	...	...	...	...	...	851	509	1·6
South-Western	41	47	56	77	46	26	7	7	2	1	...	1	1,142	311	3·6
North-Western	270	33	26	9	6	5	3	1	...	1	...	...	549	354	1·5
North-Eastern	6	5	6	1	...	...	...	...	...	...	...	...	38	18	2·1
Brook	48	62	30	22	6	2	1	...	...	...	...	...	399	171	2·3
Northern	78	89	9	3	...	...	...	...	...	...	...	...	295	179	1·6
Gore Farm	16	28	6	4	2	1	...	...	...	...	...	...	122	57	2·1
Total	1,168	1,055	528	322	152	66	28	10	3	4	1	4	7,708	3 341	2·3

TABLE CVII.—Showing number of Injected Cases in which the presence of Diphtheria bacilli could not be demonstrated, and the average number of Injections per case treated with serum from outside sources.

1895.

Number of Injections ... / HOSPITALS.	1	2	3	4	5	6	Total Injections.	Number of Patients.	Average Number of Injections per Patient.
Fountain	12	5	...	...	...	...	22	17	1·2
Western	45	11	1	...	...	...	70	57	1 2
Eastern	31	7	7	1	1	1	81	48	1·6
South-Eastern ...	19	40	1	...	...	...	102	60	1·7
South-Western ...	6	6	5	2	2	...	51	21	2 4
North-Western ...	32	3	1	...	...	...	41	36	1 1
Northern	...	2	...	...	...	...	4	2	2·0
Total	145	74	15	3	3	1	371	241	1·5

TABLE CVIII.—Showing number of Injected Cases in which the presence of Diphtheria bacilli could not be demonstrated, and the average number of Injections per case treated with serum from the Laboratories.

1895.

Number of Injections ... / HOSPITALS.	1	2	3	4	5	6	7	12	Total Injections.	Number of Patients.	Average Number of Injections per Patient.
Fountain	5	2	2	1	...	...	...	...	19	10	1·9
Western	5	6	2	2	...	...	1	...	38	16	2·3
Eastern	4	6	1	2	...	...	...	...	27	13	2·07
South-Eastern ...	15	14	...	...	...	...	...	...	43	29	1·4
South-Western ...	3	2	5	3	1	1	2	1	71	18	3·9
North-Western ...	2	3	...	...	...	...	1	...	15	6	2·5
Northern	1	1	...	...	...	...	...	...	3	2	1·5
Total	35	34	10	8	1	1	4	1	216	94	2·2

TABLE CIX.—Showing number of Injected Cases in which the presence of Diphtheria bacilli could not be demonstrated, and the average number of Injections per case treated with serum from the Laboratories.

1896.

Number of Injections ... / HOSPITALS.	1	2	3	4	5	6	Total Injections.	Number of Patients.	Average Number of Injections per Patient.
Fountain	28	37	14	5	2	1	180	87	2·06
Western	36	17	9	4	2	1	129	69	1·8
Eastern	23	19	9	2	2	...	106	55	1·9
South-Eastern	51	28	2	3	...	...	125	84	1·4
South-Western	7	4	2	2	3	1	50	19	2·6
North-Western	34	5	1	...	1	1	58	42	1·3
North-Eastern	3	2	...	...	...	1	13	6	2·1
Brook...	7	5	4	1	...	...	33	17	1·9
Northern	12	12	2	1	...	...	46	27	1·7
Gore Farm	2	7	1	1	...	...	23	11	2·09
Total	203	136	44	19	10	5	763	417	1·8

the average number of units given was 1,273·2 at the North-Western, and 1,235·1 at the Fountain (Table LXXXIX.). We find, however, that the difference in this case is accounted for by the fact that on the first two days of the disease the average number of injections at the Fountain Hospital is considerably higher than at the North-Western; it is somewhat lower on the third day, is about the same on the fourth day, is higher on the fifth, and is of considerable quantity where the onset of the disease has occurred in the hospital, whilst at the North-Western no cases came under this last heading; so that the quantities given in the earlier stages are high, though the quantity given in the later stages is somewhat lower. At the South-Western Hospital the number of injections and the number of units given are both high. Period of Injection.

In the preceding tables an attempt has been made to separate the results obtained by injection with serum supplied by the laboratories and serum supplied from other sources. The bulk of the antitoxin not supplied by the laboratories was, I am told, obtained from the British Institute of Preventive Medicine at a period when the possibility of obtaining a serum of high strength had not been fully recognised; and the bulk of this serum was standardised by Roux's method, and according to calculation seldom contained more than from 10 to 30 units per c.c. In 1894 the bulk of the serum used was of this strength. In 1895 most of the serum supplied was about this strength, though, as will be seen on reference to the table of the strengths of antitoxin (p. 158) a considerably stronger serum was sent out from the laboratories in the last couple of months of the year; so that we should expect that some slight improvement as regards the percentage mortality should be noted between the beginning and the end of the year 1895. As it is impossible to separate the cases by dates, it was thought advisable to get out tables for 1895 giving the results of the use of the serum obtained from the laboratories, and of that obtained from other sources. That obtained from other sources can only be stated in terms of c.c., as it was sent out with its strength determined according to the French standard. As, however, it would range from about 10 to 30 units, it may be taken that it contained on an average 20 units per c.c.; so that by multiplying the number of c.c. mentioned in the various tables by 20 a fair approximation will be obtained of the number of units, and thus the number of units may be calculated for each case where the average number of c.c. at each injection is given. By comparing the average number of injections with the average number of units or c.c. given in the preceding tables, some idea of the different methods adopted in different hospitals may be arrived at; and by comparing these with the percentage mortality, some idea of the success of these various methods of treatment may be obtained. It is very interesting to observe what fallacious inferences may be drawn from the study of small groups of figures, for a mere general glance at these tables and a superficial comparison of the average number of injections with the percentage mortality might at first sight lead one to the conclusion that the larger the number of injections the greater the mortality. But a careful study of the results obtained invariably shows that the larger the quantity of antitoxin given during the earlier stages of the disease the lower is the death-rate, whilst the larger the number of cases that come under treatment in the late stages, however large be the quantity of antitoxin given, the higher is the percentage mortality resulting from the addition of these cases.

On p. 95 is given a general summary of the certified cases of Diphtheria in which Diphtheria bacilli were found, and on p. 96 a general summary of those cases in which, though they were certified as Diphtheria, no Diphtheria bacilli were found.

GENERAL SUMMARY OF CASES IN WHICH DIPHTHERIA BACILLI WERE FOUND.

1895.

Hospital	Total Cases	All cases injected with Antitoxic Serum	Cases in which no Antitoxic Serum was injected	Rashes	Paralytic Cases	Pneumonia Cases	Faucial Cases	Laryngeal Cases	Tracheotomy Cases	Haemorrhagic Cases	Cases that were admitted to the various Hospitals certified as	Average Number of Days in Hospital	Tonsillitis Cases	Diphtheria bacilli found at last examination and patients discharged	Rhinitis Cases	Relapse Cases	Cases transferred to the Government Hospitals	Fatal Results
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1896.

Hospital	Total Cases	All cases injected with Antitoxic Serum	Cases in which no Antitoxic Serum was injected	Rashes	Paralytic Cases	Pneumonia Cases	Faucial Cases	Laryngeal Cases	Tracheotomy Cases	Haemorrhagic Cases	Cases that were admitted to the various Hospitals certified as	Average Number of Days in Hospital	Tonsillitis Cases	Diphtheria bacilli found at last examination and patients discharged	Rhinitis Cases	Relapse Cases	Cases transferred to the Government Hospitals	Fatal Results
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* For fatal results see last column of this Table.

* For percentages see second and third columns of this Table.

GENERAL SUMMARY OF CASES IN WHICH NO DIPHTHERIA BACILLI WERE FOUND.

1895.

[illegible]	[illegible]

1896.

[illegible]	[illegible]

THE PREPARATION OF DIPHTHERIA ANTITOXIN.

Arrangement with the Laboratories of the Royal Colleges.

From the Tables on Pages 78 to 93 it will be gathered that the Diphtheria Antitoxin in the hospitals under the Board was at first obtained from widely different sources. In *the early periods* of the Antitoxin treatment it appears to have been found by the Board that it was a somewhat difficult and expensive matter to obtain a constant and sufficient supply of Antitoxin, and on the 9th of November, 1894, a communication was sent from the Metropolitan Asylums Board to the Laboratory Committee of the Royal Colleges of Physicians (Lond.), and Surgeons (Eng.), asking "whether the Royal College of Physicians and Surgeons will be willing to supply, and, if so, when, and on what terms, Diphtheria Antitoxin for use in the Hospitals of the Board." Request made by the M.A.B.

After careful consideration the Laboratories' Committee came to the conclusion that it was desirable "for the Colleges to take advantage of the opportunity offered them by the Board, of undertaking this work which is so closely connected with the bacteriological investigation of doubtful cases of diphtheria, if they could do so without involving the Colleges in any additional expense." Holding this view they decided to inform the Board that they would be willing to supply Diphtheria Antitoxic serum on the following conditions:—viz., Suggested Arrangements

"That the Metropolitan Asylums Board will afford accommodation on one of their farms near London for the required number of horses, such accommodation to include the services of the necessary stable attendants and the keep of the animals, and that other expenses entailed in the preparation of the serum should be defrayed by the Metropolitan Asylums Board, with the exception of the initial cost of the horses, which will be provided by the Royal Colleges."

The advantage of this arrangement appeared to the Laboratories' Committee to be:— Advantages of these Arrangements

(*a*) That the work could be carried out in conjunction with the bacteriological examination of cases;

(*b*) That definite information could be obtained in regard to the method of preparation and the exact strength of the Antitoxin used in these cases;

(*c*) That further researches could be conducted for the improvement of the preparation of Antitoxic serum, and possibly also of the method of treatment; and,

(*d*) That the results could be compared from both "bacteriological" and "antitoxin" points of view.

Offer of the Honourable Goldsmiths' Company.

Whilst these negotiations were in process of development, or rather immediately after they had been completed, and the conditions drawn up by the Laboratories' Committee had been endorsed by the Board, the Chairman of the Laboratories' Committee of the Royal Colleges received the following letter from Sir Walter Prideaux, Clerk to the Goldsmiths' Company, viz.:—

Goldsmiths' Hall,
London, E.C.,
November 20th, 1894.

Sir,—

"The attention of the Goldsmiths' Company has been drawn to the reports of the Antitoxin treatment of Diphtheria, which has recently created so much interest, both on the Continent and in this country; and the Company are led to believe that, although this treatment has not, perhaps, as yet passed out of the stage for experiment, there is much reason to hope that further investigations may lead to the attainment of a remedy which will largely reduce the mortality arising from this terrible disease. Letter from the Goldsmiths' Company.

"The Company are informed that there is great difficulty at the present time in obtaining a supply of serum adequate to the treatment of patients on an extended scale, and that the cost of the serum is also heavy.

"The Company also understand that while on the Continent experiments are being continued with Funds provided from Public sources, the work must be left in this country to private enterprise and liberality.

"Under these circumstances the Company have decided to make a grant of £1,000 for the purpose of prosecuting research work in connection with this treatment, with which they desire to combine, if possible, the supply of serum for use amongst the Poorer Classes of the community.

"I am desired to inquire whether the Conjoint Board of the Royal Colleges of Physicians and Surgeons will undertake the administration of this grant, and I am to add that the acceptance by the Board of this proposal will be received with much satisfaction by the Goldsmiths' Company.

"I am, Sir,

"Your obedient Servant,

(Signed) "WALTER S. PRIDEAUX."

The Chairman of the Laboratories' Committee,
Conjoint Board of the Royal Colleges of
Physicians and Surgeons.

Offer accepted by the Royal Colleges.

It was considered by the Laboratories' Committee that the Royal Colleges would be desirous of taking advantage of this munificent offer by the Goldsmiths' Company, and it was decided to accept the offer, as it would afford an opportunity of extending the facilities for carrying on original investigation on Antitoxins, whilst it was also thought that should there be any surplus of Antitoxin after the requirements of the Metropolitan Asylums Board had been met arrangements might be made with the Board for the transference of this surplus, at the cost of production, from the Board to the Laboratories' Committee for use amongst the poorer classes of the community and for the prosecution of research work in connection with the improvements in the methods of preparation of the serum to which reference has already been made.

Provision of Accommodation for Horses.

Description of Stables at Tooting.

After some unavoidable delay, resulting from the difficulty of finding suitable premises in a convenient locality, and after the Director had visited Gore Farm, Dartford, and one or two other suggested sites, the Board placed stabling on their estate at Tooting at the disposal of the Laboratories' Committee. This stabling was in two separate blocks, one of which was practically divided into two perfectly isolated stables. In each of the two larger stables there were four stalls. There was also a coach-house which was easily converted into stalls for the reception of four horses. Next to the coach-house was a loose box, which was used as an isolation box for any horses that might be ill or that were brought fresh to the stable. There was one other small coach-house which might be converted into a loose box, and a small isolated building which might, in case of emergency, be converted into another isolated loose box. This latter, however, was never required, and the small coach-house was, after a time, converted into a side room laboratory in which the necessary arrangements were made for carrying out the various processes involved in the preparation and collection of the Antitoxic serum. There was ample space for grazing and exercising the horses in the grounds near the stables.

On the 18th of January, 1895, the stables having been thoroughly cleaned and put into good repair and a couple of horse-keepers engaged, operations were commenced at once, as three horses had been obtained by the authorities at the Brown Institution (to whom the Laboratories' Committee are under a deep obligation for their kindness in this matter), and kept under observation by me for some time. Before going further it may be well to give a brief description of all the animals that were brought into these stables between the 18th of January, 1895, up to the time that, owing to building operations, it became necessary to remove the horses to other quarters. Several other horses besides those here mentioned were purchased, but, for some cause or other, were rejected as being unsuitable for the production of Antitoxin. Wherever it was possible the horses were injected with Mallein before being brought to the stables, but, in one or two instances, it was necessary to examine the horses at Tooting. Such horses were placed in a special loose box which served as an isolation and observation ward, and animals in which there was the slightest suspicion of disease that could be transmitted to the other horses were not allowed to be kept in either of the general stables amongst the other animals.

All the Horses purchased were not used.

List of Horses Treated.

The following is a list of the horses that went to Tooting, and the conditions they presented before being subjected to injection with Diphtheria Toxins:—

Horse (charger) No. 1. A good carriage horse (aged), standing sixteen hands, was bought at the Brown Institution in the first week of January, 1895, and was at once tested with Mallein, when it gave no re-action. A fortnight later Mallein was again injected, and as there was still no re-action, the horse was considered to be free from any trace of glanders, and was removed to the stables on the 18th of January. Later during the course of treatment, this animal (see chart No. 1) gave no re-action to the tuberculin test.

Brown Pony, No. 2, was bought at the Brown Institution, where it was injected with Mallein, and giving no re-action was removed to Tooting in the third week of January, 1895. This animal (aged) was slightly lame and was found to be suffering from a mild attack of laminitis. It afterwards gave no re-action to the tuberculin test. It was therefore free from both glanders and tuberculosis, and treatment was commenced as soon as the laminitis had disappeared (see Chart No. 2).

Bay Mare, No. 2A. Bought at the Brown Institution in the second week of January 1895. On injection with Mallein there was a doubtful re-action. A week later at Tooting the animal was again injected with Mallein. The next day the re-action was so far typical that, although there were no other signs of glanders, it was thought necessary to have the horse killed. This was done immediately, and some suspicious nodules were found in the lungs. These nodules were afterwards described to me as being small, hard and isolated, and although I did not see the post-mortem examination made, or the organs after the examination, I have little doubt that the animal was suffering, or had suffered, from an attack of what might be called latent glanders, as there were no lesions of any kind by which the disease could be recognised during life.

Bay Mare, No. 3, was bought at the Royal Veterinary College, January 20th, 1895. She had at one time been driven by Mr. G. Abingdon Baird. Latterly she had been driven in a hansom cab, but had gone lame. Aged six or seven years. She was in splendid condition. There was no re-action to either Mallein or Tuberculin, *i.e.*, the animal was quite free from both glanders and tubercle.

Black Colt, No. 3A, was bought at the Brown Institution, March 4th, 1895. This colt (a two year old) could never be worked because of a deformed leg. It was a very well bred animal. There was apparently a re-action to Mallein. A week later the animal was again injected with Mallein, but it was then found that the temperature was 105° F. immediately after the injection had been made, so that the test made under these conditions could be of no value. As there was a nasty cough and a watery discharge from the nostrils, suffusion of the eyes and a commencing swelling under the jaws, the animal was kept under careful observation. As the condition was diagnosed as "strangles," a disease very common in young horses, it was determined to get rid of the animal as soon as possible; this was accordingly done.

Brown Cob, No. 3B, was bought, April 11th, 1895, from Griffin, of Balham. Age ten to twelve years. Injected with Mallein. No re-action was obtained, and the animal was evidently perfectly free from glanders. Injection of this animal with diphtheria toxin was commenced on the 24th of April, but it was found to be so very susceptible to the action of the toxin that only very minute doses indeed could be given. At that time, as we had no method of rapidly accustoming the tissues to the presence of toxins, it was considered that it would take too long to raise the Antitoxin producing powers of this animal to a usuable strength, and at the end of a month the attempt was abandoned and the animal exchanged for the *Dun Mare, No.* 5.

Chestnut Cob, No. 4 (age five years) was bought at Raynes Park, 20th of April, 1895, with swelling on off hind knee and fetlock joint; otherwise in capital condition. It was a most spirited, but good tempered animal. The swelling on the knee was due to a cut; that at the fetlock appeared to be a ringbone. He was sound in every other respect. Gave no re-action with Mallein; nor was there any evidence of tuberculosis present.

Dun Mare, No. 5 (aged), was taken from Griffin in exchange for Brown Cob, 3B, on the 10th of May, 1895. This animal had been overworked, but was very sound and clean. She gave no re-action with Mallein, and was free from tubercle. She was injected with Diphtheria Toxin for the first time on the 23rd of May, 1895.

Grey Cob (Russian), No. 6 (aged), was bought from Griffin, 6th of June, 1895. He had a lame fetlock joint on the off fore leg. His condition was not very good when he came to us, but improvement was very rapid, even after the first day or two. On the 10th of June, 1895, a Mallein injection was made, but there was no re-action, and the animal was declared to be free from glanders. There was no evidence of the presence of tubercle. The animal was carefully fed and exercised, and improved greatly in condition. On July 3rd treatment was commenced.

Big Chestnut Mare, No. 7, was bought from Griffin, 21st of August, 1895. She is "gone over" in the forelegs a little from hard work, but has been a very good animal, and is still in very fair condition. Reported age, nine to ten years. Mallein was injected on the 28th of August, and no re-action was obtained. Later, no evidence of tubercle could be found. After being fed and exercised for a month the condition of this mare improved very greatly. She takes a five barred gate easily. She was first injected with Diphtheria Toxin, 26th of September, 1895.

Big Dun Horse, No. 8, was bought from Griffin, 1st of October, 1895. He was a big framed animal (aged) in poor condition, and had been overworked up to the time he came to us. He was injected with Mallein on the 4th of October, but gave no re-action, and was then well fed and carefully exercised for a month. There was not the slightest evidence of tuberculosis. On the 2nd of November injections were commenced.

Steeple Chaser ("Good Friday"), No. 9. This horse (aged), an exceedingly well-bred animal, spirited but good tempered, was bought from Griffin in the first week of January, 1896. He improved in condition very rapidly, and was injected with Mallein on 15th of January, 1896, but gave no re-action. He was also quite free from tuberculosis. Treatment with Diphtheria Toxin was commenced on 25th of January, 1896.

White Faced Bay (aged), No. 10, was bought from Griffin on 4th of December, 1896, in fairly good condition. Injected with Mallein 7th of December, 1896. He gave no re-action, and no evidence of the presence of tubercle could be obtained. This animal was kept under observation and brought into good condition during a period of six weeks, and treatment with Diphtheria toxin was commenced on 16th of January, 1897.

Big Bay Horse, No. 11, was bought from Griffin, 8th of December, 1896. He was a big-boned horse (aged) in poor condition, as he had been overworked. On being tested with Mallein he gave no re-action. After being well fed and carefully exercised for three weeks he was again tested with Mallein, and was found to be quite free from glanders. There was not the slightest evidence of tuberculosis. He was carefully fed and looked after for a further period, and on 16th of January, 1897, was in such good condition that it was decided to inject him with Diphtheria Toxin for the preparation of Antitoxin.

Black Mare, No. 11A, was bought from Griffin on the 4th of June, 1897. She was not in very good condition, but gave no re-action under Mallein, and was free from tubercle. After being kept under observation for about six weeks she was first injected with Diphtheria Toxin on the 12th of July, 1897. Although she was subjected to very vigorous treatment the anti-toxic value of the blood never became very high, and serum from this horse was never sent out to the Hospitals.

Grey Horse, No. 11B, was bought from Griffin, 28th of June, 1897, in fairly good condition. No re-action to either Mallein or Tuberculin could be obtained. He improved rapidly within a fortnight, and injections were commenced on 12th of July. Here again it was found impossible to raise the antitoxic value of the serum, and eventually, after the 9th of October, all efforts to obtain strong antitoxic serum from this horse were abandoned.

Horse No. 12, "Brown Cob," Gelding (age unknown), was bought from Griffin at the end of December, 1897, or early in January, 1898. At first in somewhat meagre condition, it was free from glanders and tuberculosis, and rapidly improved. It received a considerable quantity of what was afterwards found to be an exceedingly weak Diphtheria Toxin, containing ascitic fluid, but the first real injection was made on January 16th, 1898.

Horse No. 13, "White-faced Mare" (aged), was bought from Griffin early in February, 1898. Tested with Mallein on the 12th, no reaction was obtained. This horse was in good condition and was free from tuberculosis. Treatment was commenced on the 23rd of February.

The horses are kept unshod, but arrangements have been entered into with a farrier to keep their feet in good condition. Principal McFadyean and Professor Hobday, of the Royal Veterinary College, Mr. Garside, M.R.C.V.S., and Mr. Arnold, M.R.C.V.S., have from time to time given us most valuable information and advice as to the treatment and management of the horses that came under our care. I may say that from the very outset our experience of accidents among our horses, either as regards injury or illness, the result of disease or irregular feeding, has been exceedingly small, and we have, indeed, been far more fortunate in this respect than most owners of horses, a state of affairs that we scarcely anticipated when we first undertook the charge of horses to be used for the production of anti-diphtheritic serum.

Description of the New Stables at 63, Alderbrook Road, Balham, S.W.

Other horses purchased after this date went to the new Stables, of which it may be well to give a short description, although the antitoxin prepared from the new horses cannot be considered in this Report.

Reasons for making change.

In 1897 it was found impossible to continue the work at Tooting; the place was put into the hands of the contractor who was building the boundary wall for the new Asylum, and it was necessary to look out for further accommodation. At length this was found in Alderbrook Road, where a yard in which the horses could be exercised was found, and a building that could be readily converted into a stable.

Plan of Buildings.

Small Laboratory.

Isolation Boxes.

Stall Accommodation and Ventilation.

Shed in which Injections are made

The accompanying plan, drawn to scale, Fig. 2, gives a good idea of these premises The dwelling house facing Alderbrook Road, and bounded on the one side by the narrow lane leading to the yard, is occupied by Mr. Millar, who assists in the preparation of antitoxin; he is thus able to keep the horses under constant observation. In the yard is the "Tan" ring prepared for the exercising of the horses; to the left of this is a small and very convenient laboratory in which all the sterilising of tubing and the decanting of the serum is carried out; here, also, preparations are made for the injection of the horses and for the withdrawal of the blood from those animals that are yielding antitoxic serum. Facing the entrance are a couple of excellent isolation boxes, specially built and fitted up for the purpose, and next to these, but well isolated, is a small stall for the pony that is used to convey toxins from the laboratories on the embankment to the Stables, and to take in from the Stables to the laboratories the antitoxic serum. The main stable, which, like the isolation boxes, has an excellent concrete floor, has stall accommodation for ten horses; it is well ventilated by means of hopper windows and four ventilation shafts (near the wall opposite the hopper windows), each two feet square, carried up to the roof; the walls are also concreted and cemented and all the fittings are exceedingly simple and easily cleaned. To the right of the stable is a yard in which stands a covered, well-lighted shed; the floor of this yard is asphalted and readily cleaned. Under this all the operations of injecting and bleeding are carried on. Excellent stocks, recommended by Principal McFadyean, of the Royal

Veterinary College, to which certain additions have had to be made, are in the centre of the covered enclosure. An abundant supply of water, both hot and cold, is here laid on. Above the stabling is a hay and corn loft.

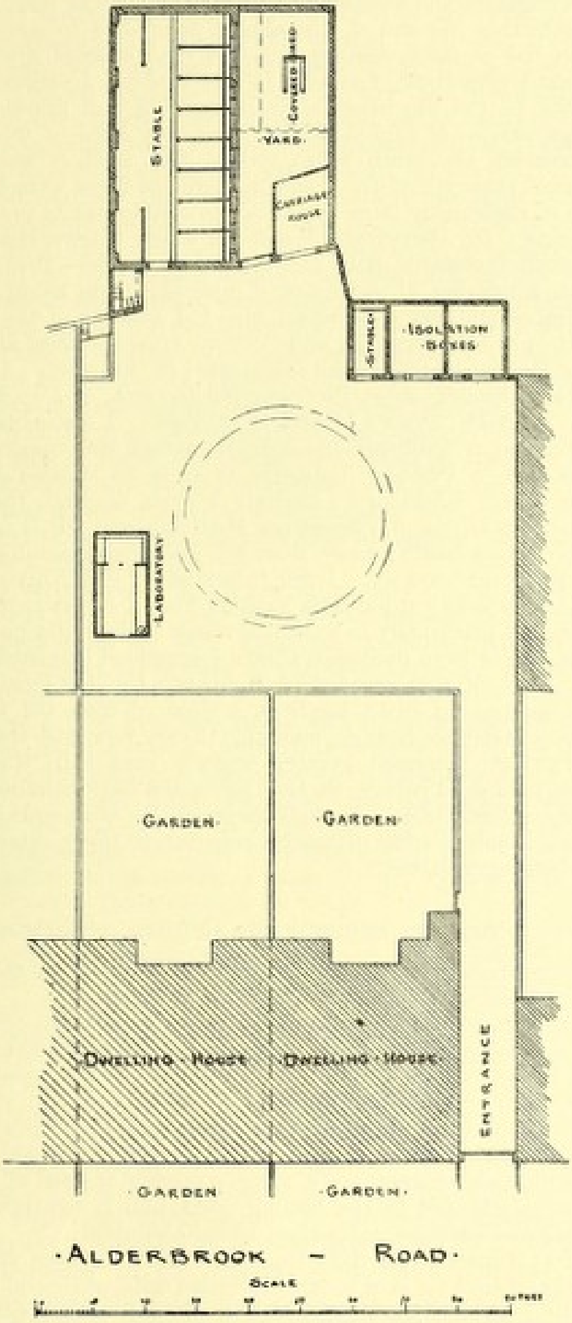


FIG. 2.—PLAN OF STABLES, ETC, AT ALDERBROOK ROAD, BALHAM.

The toxins for the injection of the horses are prepared at the laboratories, but all the injection work has to be done at the stables.

Preparation of Diphtheria Toxin.

Although the descriptions of the methods of obtaining the best diphtheria toxins are almost as numerous as the investigators who have worked at the subject, the results obtained and recorded have been so contradictory that one was at first almost compelled to come to the conclusion that the personal element in the equation dealing with the production of diphtheria toxin was a very important, if not the most important, factor. It was evident, however, that one of the main elements of success must be the use of an actively growing and functionally active diphtheria bacilius. Taking a large number of diphtheria bacilli as they came in from the hospital, making pure cultures and inoculating the broth which was at first used, it was found that there were almost as many degrees of strength of the resulting toxin as there were bacilli used, whilst none of them produced toxin in sufficiently large quantities to enable one to use the toxin with success in any of our experiments. Dr. Cartwright Wood—to whom I have throughout this work been greatly indebted for much invaluable help and many suggestions—then passed the most active of these bacilli through a number of guinea-pigs, injecting them along with sterilised charcoal particles or soluble silicates, and was enabled to raise the activity of the bacillus, as regards its toxin-forming functions, very considerably; and for some time the most active group of organisms so obtained was used for the production of the toxins used in this work. I then obtained a sample of a very active diphtheria bacillus from Professor Salomonsen, of Copenhagen; this bacillus, I believe, originally came from Dr. Roux's laboratory in Paris. I also obtained a specimen direct from Dr. Roux, to whom, and to Professor Salomonsen, I take this opportunity of expressing my very cordial thanks; as also to Professor Calmette, of Lille, for another specimen, also probably coming originally from Roux's laboratory. Latterly I have, through the courtesy of Dr. Allan Macfadyen, of the British Institute of Preventive Medicine, and Mr. T. J. Bokenham, M.R.C.S., received samples of other active bacilli; those from Mr. Bokenham coming from Dr. Wassermann, and a second from a Vienna laboratory. I am informed by Dr. Kinyoun that in most of the Continental laboratories Dr. Park's "diphtheria bacillus No. 6" is now in general use, and that this is the organism that is used principally in America, where exceedingly good results are at present being reported. As yet I have been unable to obtain a sample of this bacillus, but it is apparently a very active variety.* Most of the samples of diphtheria bacillus form toxin sufficiently active to kill a 500-grammes guinea-pig in 48 hours in a dose of from 0·1 to 0·02 c.c., and for all practical purposes such a strength is high enough. Every now and then, however, a batch of toxin has been found which possessed greater toxicity than this, though, so far as can be gathered from a study of published papers, we have used, and have obtained our results with, toxin of less lethal power than is used abroad; though these results, as regards the production of potent antitoxin, are quite equal, if not, in some instances, superior, to those obtained by the use, probably of smaller quantities, of stronger toxins.

The importance of using an active Bacillus.

Sources of Diphtheria bacilli used in this work.

Preparation of Nutrient Bouillon for Growth of Diphtheria Bacilli.

The method of preparation of the nutrient bouillon in which the diphtheria bacillus is grown and the toxins produced which we now use is the following:—

Veal used in preference to beef.

Meat (veal) is thoroughly minced, and all fat and connective tissues removed; to each pound of meat 800 c.c. of water is added; this mixture is allowed to stand for two or three hours, and is then boiled for 12 hours, care being taken to break up the meat into as fine a form as possible, and to keep it from running together into masses by thorough shaking during the early stages of the boiling. The fluid is expressed from the meat in a screw press; to the measured quantity 2 per cent. of Witte's peptone is added, and is boiled for an hour, after which it is allowed to cool and is filtered. Sometimes a mere straining instead of filtering is resorted to. The broth is then thoroughly heated to the boiling point, and is neutralised or rendered faintly alkaline to phenol-phthaleine with normal sodium hydrate solution.

Broth is rendered faintly alkaline.

It will be found that meat treated in this way usually requires from 30–33 c.c. of normal sodium hydrate solution per litre to give a faint reaction with phenol-phthaleine; this, however, should not be taken for granted; a rough titration should always first be performed, using 10 c.c. of the broth and $\frac{N}{100}$ sodium hydrate solution.

After the broth has been neutralised, it should be boiled for a couple of hours, and when cold transferred to the large flasks in which the toxin is to be produced and is boiled to ensure its continued sterility. The broth is not now filtered a second time, the results obtained appearing to be better, rather than to have suffered, in consequence.

Original method of preparation of broth.

Originally beef was used in place of veal, and the broth was made in the following fashion:— After the meat had been cleaned and minced, a litre of distilled water was poured on each pound of beef, and to this a pinch of common salt was added, and the mixture was allowed to stand from 12–24 hours in a flask in a cool place; the fluid was then thoroughly expressed from the meat by means of a screw press, and the volume was made up to the original quantity by the addition of sufficient distilled water; 0·5 per cent. of common salt and 1 per cent. of peptone were added, and the whole was boiled for one hour. It was then allowed to cool, filtered, neutralised to litmus, and again boiled for two hours, after which from 5–7 c.c. of normal caustic soda was added per litre. In place of litmus, rosolic acid was later used as the indicator, but eventually phenol-phthaleine was found to give the most constant results, especially as the toxin prepared in broth neutralised to phenol-phthaleine, though, with a few exceptions, not perhaps actually stronger than certain

* Since this was written Dr. Park has very kindly sent to me a specimen of this bacillus, which we find produces exceedingly active toxin.

single batches that were obtained by other methods, has certainly been much more consistently good than those that we were able to obtain in our earlier experiments. At the suggestion of Professor Ehrlich I made the broth a little stronger, and afterwards eliminated the salt, which appears to play no part in either increasing or diminishing the activity of the toxin obtained.

Common salt not used and broth made stronger.

From time to time various methods of producing more active toxin have been put forward. Thus Roux* strongly recommends the passage of a current of air over the surface of the medium in which the diphtheria bacillus is growing. He certainly appears to have obtained stronger toxin with the material at his disposal when using it in this way than when simply closing the flasks with plugs of cotton wool and allowing the contents, fluid and gaseous, to remain at rest. I have given this method a very thorough trial, but, after comparing the toxins obtained by this and other methods, have come to the conclusion that this was certainly not the only, or most important, factor to be considered. Ruffer† modified this method of aerating the fluid in such a fashion that the air was compelled to pass through the fluid. After a careful trial of this method, it, too, was discontinued, as it was found that the toxin, in place of being stronger, was in most instances considerably weaker than that obtained by simpler methods; the motion of the fluid appears to interfere with the growth of the bacillus, especially in so far as it prevents the formation of a film on the surface, without which film the best toxins seldom appear to be produced. I then tried the late Dr. Hunt's‡ method of floating the bacilli on fragments of cork on the surface of the fluid, so that there might be surface foci from which the film might easily spread. Here the results obtained were certainly satisfactory, though by this time I had obtained a bacillus which would grow on the surface of the fluid in such profusion as to form a film of considerable thickness; it may be stated that most of those diphtheria bacilli that produce toxins in large quantities have, as pointed out by Aronson, this faculty of surface growth highly developed. Roux had early pointed out that in media rendered only slightly alkaline the bacilli as they grow produce so much acid that the alkaline reaction is lost and the growth of the bacillus, for which an alkaline medium is necessary, is brought to a standstill.

Methods tried for the production of more active toxin.

Thus, if a bacillus be inoculated into a neutral or only slightly alkaline broth—*i.e.*, neutral to litmus—it will be found that there may be a slight growth for a short time, but that this soon stops, the upper portion of the fluid becoming perfectly clear, and a small sediment of diphtheria bacilli accumulating at the bottom of the flask or tube. A similar culture growing in a strongly alkaline medium—*i.e.*, one neutral to phenol-phthaleine—gives rise to a very different appearance. The fluid, as a rule, becomes turbid, and remains so almost as long as the growth of the bacillus continues, though, where the surface growth is well marked, this turbidity may disappear after a few days; the surface growth becomes a marked feature, and in some cases a film of such extraordinary thickness makes its appearance that, until microscopical examination is made, one is almost led to believe that some impurity has crept in. At the bottom of the tube a sediment of considerable thickness is usually found, and if the tube be gently shaken each day and the scum shaken to the bottom, a fresh film will appear time after time; with each film and the continued growth there appears to be an increase in the potency of the toxin. Spronck§ made a series of experiments from which he argued that the acid reaction that makes its appearance in diphtheria cultivations is probably due to the presence of sugar or glycogen in the muscle of the animal that is used; he recommended, therefore, that all flesh used for the making of broth in which diphtheria cultures were to be grown should, in the first instance, be allowed to undergo putrefactive changes, in order that the acid-producing substances might be converted before the process of neutralisation is commenced. This method was very carefully tested, and certainly our results at that time appeared to be somewhat better than those that were obtained with unfermented meat, but the smell developed was so disgusting, and the results were so little superior to those obtained by other methods, that, ultimately, this method was discarded. Theobald Smith,‖ working on similar lines, got rid of the sugar by fermenting the broth by means of certain organisms—especially the *Bacillus coli communis*—which have the power of breaking up sugar and producing acid. He found, however, that this presence of glycogen or muscle sugar was a factor which in most cases might be left out of consideration, and maintained that other elements in the question were perhaps of even greater importance; but he and Park¶ both come to the conclusion that with an active bacillus a distinctly alkaline broth is, after all, the most important factor to be obtained in the production of reliable and strong toxins. In our earlier experiments it was thought that if the cultures were left to grow for a longer time stronger toxins would in all probability be produced; this, however, we found was not the case, unless the broths were again neutralised and freshly inoculated. When this is not done, the growth of the bacillus appears to stop at a certain stage, after which the toxins left in the warm chamber, instead of becoming stronger, fall off considerably in strength; this being due, apparently, either to oxidation or to some rearrangement of the molecules of the specific substances formed. The time was then reduced, first to three weeks, then to a fortnight, then to a week, and even to five days, with each reduction of time as strong, or stronger, toxin being obtained as when the growth of the diphtheria bacillus was allowed to go on for longer periods. It should be noted, however, that one of our strong toxins (D T N[r4]) was obtained from a culture that was kept in the incubator for a period of 36 days.

Surface growth and turbidity followed by a large sediment as indices.

The source of acid in Diphtheria cultures.

Notes on time taken for production of active toxins.

It has already been mentioned that the "virulence"—pathogenetic activity—of the diphtheria bacillus may play a very important part in determining the strength of the toxin that can

* *Annales de l'Institut Pasteur*, 1894, t. viii, p. 611.
† Bertram Hunt, *Trans. Path. Soc.*, 1895, vol. xlvi., p. 270.
‡ *Loc. cit.*
§ *Annales de l'Institut Pasteur*, 1895, t. ix, p. 758.
‖ *Centralb. f. Bakt. u. Parasitenk.*, Bd. xviii., S. 1, 1895.
¶ *Journ. Exp. Med.*, vol. i., 1896, p. 164.

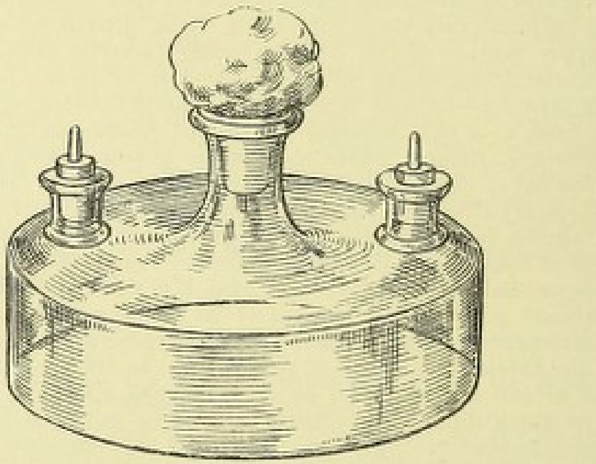
be produced from any given broth and in any given time, though this is not invariably the case, and some of those taken from the least virulent cases give the most active toxin. It has also been noted that those diphtheria bacilli that are the most active toxin-producers grow in such fashion that they form not only a sediment of considerable thickness, but a distinct film, the consistence of which varies in different cases, sometimes being thin and brittle, at others thicker and tougher, so that when the fluid is shaken the fragments of the broken film fall to the bottom in comparatively large flakes. The appearance of the film and the turbidity of the fluid appear to afford some indication as to the suitability of the medium for the production of active toxin; when these appearances are fairly well marked it may usually be accepted that conditions favourable for the production of strong toxin are present.

Daily re-inoculation necessary for the maintenance of the activity of the Diphtheria bacillus.

In order to keep up the activity of the bacillus it is found well to re-inoculate daily. Transference of the organism from broth in which certain of its products are accumulated—and which products, as in the case of all these organisms, exert a deleterious effect upon the organisms themselves—to a fluid in which there are all the elements of nutrition and none of the excreted products, appears to be favourable to the maintenance of the toxin-forming activity of the bacillus at its highest point, with the result that, so long as regular transference is kept up, a bacillus is at hand which may at any time be inoculated into large quantities of broth for the production of stock toxin.

Aeration flasks.

When Roux's aeration method was used I had a number of flasks, of which Fig. 3 is a sketch, manufactured, as I found that the flasks into which the side-arms were fused were very easily broken and could not be readily mended; moreover, they were very expensive. Each flask has three necks like those in a Wolff's bottle; through the lateral openings glass tubes for the entrance of air pass through india-rubber corks. The central orifice serves as an opening through which the inoculations may be made after everything has been fitted up; this opening is closed with cotton wadding, and then rendered air-tight by means of a well-fitting india-rubber



$\frac{1}{3}$ Full Size.

Fig. 3.—Flask for Aeration of Diphtheria Cultivation.

cap. Into each of the lateral tubes a plug of cotton wadding is also placed, and the whole flask is sterilised. 200 c.c. of broth, prepared as above described, is placed in the flask and the whole sterilised; it is then ready for inoculation. Some two or three dozens of these flasks were usually prepared at one time, and were then inoculated with quantities of from 5 to 10 c.c. of a 24-hours old culture of an actively growing diphtheria bacillus. The flasks were then placed in the hot air chamber (described on next page), and left for 24 hours. At the end of this time a tube in connection with the exhausting apparatus was placed on one of the side tubes, and another, leading in air from the outside through a layer of quicklime and then through a large bottle containing water, placed in the incubator, and so maintained at a fairly constant temperature, was attached to the other. By means of a Geissler pump and an arrangement of separate converging pipes a current of air could be kept passing over some five or six dozens of these flasks at once.

Aeration now discontinued.

As already mentioned, this method has now been discontinued. The same flasks are used as they allow of a good surface growth, but instead of 200 c.c. of the broth 400 or 500 c.c. is placed in each flask, so that much larger quantities of toxin may be prepared on the same shelf space. All the orifices are simply plugged with cotton wadding, so that there may still be a free exchange of air between the inside and the outside of the flask. When large quantities of toxin are required ordinary flasks filled to about two-fifths of their capacity are used, so that as much surface as possible may be obtained, and that at the same time there may be a fairly large quantity of broth in which the bacilli may grow.

Incubating Chamber.

As the production of large amounts of toxin was out of the question without having recourse to the use of a considerable number of incubators or a large incubating room, it was decided to convert one of the small tiled lavatories into an incubating room. This room was well adapted for the purpose required, except that it had a roof light, and that two of the walls were outside walls. These latter, however, were of considerable thickness, and after some experiments it was found that the gradient of the heat loss was fairly constant day and night. It was also found that, by packing with sawdust the space between the roof light and the room, the temperature was rendered still more constant. The room (Fig. 4) is divided into four parts, one forming a small entrance lobby (A), 3 ft. 10 in. broad and 5 ft. 8½ in. long; this opens into the first real incubating room (B), between which and the outside door it forms a kind of air pad. These two rooms are separated by a padded door in which a glass inspection window is inserted. Running parallel to the "lobby" is a small room (C), 3 ft. by 5 ft. 8½ in., communicating with the incubating chamber by a doorway, from which the door has been removed. In this small room is fitted one of Fletcher's gas stoves, which, drawing air into a series of tubes, heats it, and passes it out into the room again, the products of combustion of the gas being led away by an iron flue. The regulator for this gas stove is placed in what has been called the first incubating chamber (B), which is a room 6 ft. 8½ in. by 5 ft. 10 in. Leading from it are three doorways, two of them already described, the third leading into an inner chamber (D). On both sides of this room (B) are broad shelves, arranged to receive the flat jars. Along the front of each of these shelves run a couple of pipes, one of them connected with a water exhaust apparatus (three of which are fixed in this chamber), the other leading to a large bottle half filled with water. Through the water—which is kept at the temperature of the room—air may be sucked continuously, and is thus warmed and moistened. To the pipes a series of nipples are attached, so that, by means of india-rubber connections, air may be drawn through a series of flasks by the first pipe, then through the second, and so through the warmed water. To each exhaust apparatus is connected a manometer, which at once records whether the pumps are working properly or not, and the air in the flasks is being changed. Above and below these shelves,

General description.

Heating apparatus.

Air-warming and moistening apparatus.

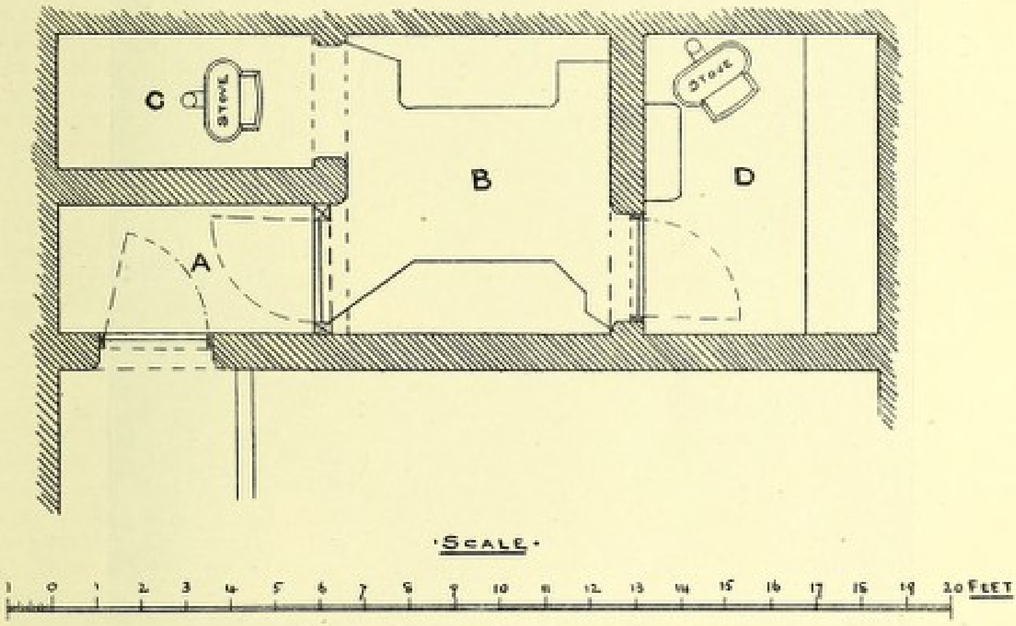


Fig. 4.—Plan of Incubating Chamber.

at medium height, are placed a number of narrower shelves, on which bottles containing serum toxin, &c., may be placed. At the level of the top shelf is placed one of Hearson's capsule regulators, by means of which the gas flame in the heating apparatus is regulated. In the second room (D), which is the same size as the first, shelves (five in number) are placed along the side opposite the door. The lowest of these shelves is 2 ft. 1 in. from the floor, and the other four are placed at intervals of 13 in. These are fitted with the aspiration apparatus, as in the other room.* To the left of the door are narrower shelves, the lowest 3 ft. 9 in. from the floor, two at intervals of 11 in., and the fourth 14 in.; these are for the large bottles in which serum toxin is prepared and other cultivations are grown. Here also is a second gas heating apparatus, with one of Hearson's regulators, placed at the level of the top shelf. The burnt air and products of combustion from this stove pass directly to the outer air, whilst around the iron chimney is a shaft which may be used for purposes of ventilation. Between the two chambers is fixed an electrical fan, by means of which the air is drawn (by means of a clockwork contact electrical apparatus, Fig. 5) from the top of the second chamber and thrown obliquely down to the floor of the first. This fan is thrown into motion for three minutes every ten minutes, or every twenty minutes, as may be required, so that the air in these rooms is often mixed and regularly distributed, and the temperature is kept somewhat more constant than would otherwise be possible. It is found, however, as a matter of practice, that, although this fan distributes the heated air to some extent, the shelves at different levels are still exposed to different temperatures. This is often very convenient, as temperatures from 30° C. to 37° C. may be obtained in the same chamber—of course, at different levels.

Circulation of warm air in Incubating Chamber.

* Since this description was written the use of the aspirating apparatus has been discontinued for the aeration of diphtheria cultures.

Optimum range of temperature.

The best temperatures for the growth of the diphtheria bacillus appear to be from 30 to 36·5° C.—some growing better and producing more active toxin at the lower limit ; others at an intermediate temperature ; others, again, at the higher limit. Though 35° C. may, generally speaking, be taken as the optimum temperature, it is necessary to determine which is best in the case of each bacillus used.

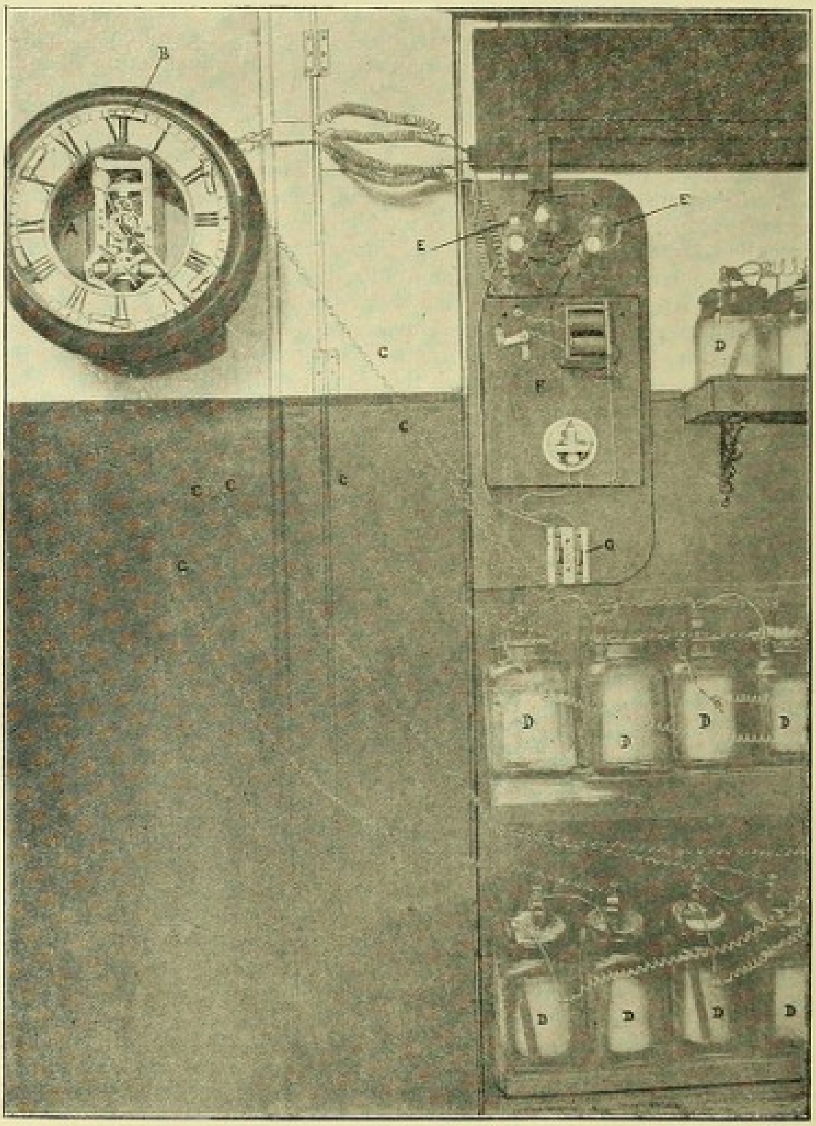


Fig. 5.—Description of Arrangement for Working of Automatic Fan.

A—Electrical clock.
B—Copper contact slips (completing circuit with motor of fan) over which the minute hand passes.
C—Connecting wires with batteries D.
E—Pilot lamp (in fan circuit), alight when fan is working.
F—Switchboard, with making and breaking arrangement when minute hand passes over contact slips on clock.
G—Fuses.

Further treatment of cultivations.

When the cultivations are removed from the incubating chamber they are poured from flasks into very tall glass jars, some of which hold 10 or 12 litres. These, of course, are carefully washed and sterilised before the contents of the culture flasks are poured in; when nearly full they are covered with a cloth, folded and soaked in carbolic acid, so as to prevent dust, &c., falling into the toxin. In twenty-four hours most of the bacilli are deposited in a layer of considerable thickness at the bottom of this jar, and the supernatant fluid is comparatively easily drawn off to be filtered through a Chamberland filter into a Kitasato filter flask. This filtration, whatever may be the reason, if carried out at once, appears to render the toxin considerably more stable than when the bodies of the bacilli are left for some time in the fluid. The strength of this toxin, as regards its lethal activity, is then tested, and the result marked on the filter flasks, which hold from 1 to 3 litres; these different sizes are very convenient, a large flask being used when a number of horses have to be injected, a smaller flask when only one or two are to be treated.

The cotton-wool plug from the lateral arm of the flask is, of course, never removed, and as soon as the india-rubber bung in which the filter is fitted is removed, the lip of the bottle having previously been carefully sterilised by means of bi-chloride of mercury or carbolic acid, and dried with sterilised cotton wool, a double sheet of parchment paper, soaked in 1 per 1,000 bi-chloride of mercury solution, is stretched over the neck and held in position by strong elastic bands. The bulk of toxin in the flasks is then put into the incubating chamber for two or three days, and such as remains bright and clear is taken out to the stables and used for injecting horses; if the fluid in any of the flasks becomes cloudy it is at once refiltered, exactly the same process being gone through as in the first filtration. In this way it is possible to get rid, entirely, of any danger there may be of abscess formation arising from the action of irritant proteids contained in the bodies of the diphtheria bacilli; further, as a matter of experience, it is found that the filtered toxin, if kept cool and protected from the light, retains its original qualities much longer than when the bodies of the bacilli are left in the fluid. The filtering arrangement is exceedingly simple. It consists of an ordinary Geissler glass exhaust pump attached to one of the taps in the laboratory; in order to increase the power of this pump a piece of composition tubing is attached by an india-rubber junction to the lower end of the glass pump; this tubing is carried to the bottom of the building, so that the weight of the falling water below the pump is brought into action, in addition to the weight of water above the pump. By this means a much better vacuum is obtained. The exhaust chamber is simply a large 5-gallon glass jar with an india-rubber cork, bored for the passage of two glass tubes, the one going to a series of filter tubes, the other to the exhaust pump. A series of eight to ten nipples, soldered or brazed into a piece of brass tubing, provides the attachments for india-rubber junctions to which the filter flasks may be fitted. There is also a T piece to which a barometer tube is fixed, the height of the mercury being read off on a graduated wooden scale. By means of this apparatus the mercury is brought to within one-half, or even one-quarter, of an inch of the barometric column.

Further reasons for the removal of the bacilli.

Description of filtering apparatus.

The filter flasks are simply ordinary Kitasato filtering flasks, into each of which is fitted a somewhat barrel-shaped or double conical india-rubber bung. In the part of the bung which fits into the flasks a piece of glass tubing, which dips down below the level of the opening of the lateral tube, is fitted. Into the other end of the bung the nipple of the filter is received. The whole of this part of the filtering apparatus is sterilised in one piece, after which an ordinary straight glass lamp-chimney is fitted around the filtering candle, and over the india-rubber bung. This forms a reservoir for the fluid that is to be filtered. Where larger quantities than this tube will hold are to be filtered a funnel with an india-rubber bung is fitted into the top of the lamp glass, and if there be a further quantity a Marriotte flask arrangement is used along with the funnel. All these filter flasks stand on a table covered with lead, the edges of the table being raised in order to prevent any fluid falling on to the floor. This leaden table—or shallow sink without an outflow, as it really is—can be swabbed with carbolic acid in a few minutes, so that there is little or no danger of the diphtheria bacilli escaping, even though a little of the fluid should be spilt during the filtering operations.

Filter flasks.

General Notes on the Growth of the Diphtheria Bacillus in Broth.

In the previous description of the preparation of toxin, the salient and more characteristic features of the growth of the diphtheria bacillus in broth have been referred to in so far as their bearing on the production of toxin is concerned; it may be well, however, to give a general connected account of the phenomena observed in the growth of the diphtheria bacillus in this medium under various conditions, and then to briefly compare it with the facts at present known of the growth of the pseudo-diphtheria bacillus in the same medium.

If a suitable and distinctly alkaline broth be inoculated with a small quantity of a vigorously growing culture of the diphtheria bacillus, and kept at a temperature of 35° to 37° C. for twenty-four hours, a fine diffuse cloudiness of the whole fluid takes place; this is brought about by the formation of fine dust-like granules, or of minute flakes, which Zarniko (1) considers to be individual colonies in which the bacilli are held together, zooglœa fashion, by an agglutinating substance which can only be broken up by very violent shaking. Some of these fine granules or flakes attach themselves to the sides of the tube, but the majority gradually fall to the bottom to form a flocculent sediment; the turbidity gradually becomes dense, and the sediment more and more copious, especially if the organism is active and vigorous in its growth. Within the same period of twenty-four hours a membrane, or film, is formed on the surface. This film is usually somewhat delicate, so that when it is disturbed by shaking the tube it is easily broken up into very fine granules or flakes, which rapidly fall to the bottom; around the fragments that remain floating on the surface a fresh membrane of a similar character is again formed in the course of the next few hours.

Appearances of a growth in a distinctly alkaline medium.

The opalescence of the broth—which, however, may vary in degree in different cultures—persists for a considerable time, so long as the broth remains sufficiently alkaline and growth of the organisms continues. So long as the deposit at the bottom increases in amount, we have evidence of the formation of the surface membrane; but ultimately, all the flocculi having fallen to the bottom, and formed a whitish deposit, and no others being formed to take their place, the broth assumes its original clearness. The growth of the bacilli, and consequently the production of toxin, may then be considered to have ceased, although it must be clearly borne in mind that the bacilli continue to live for a considerable time afterwards. Sometimes, even in alkaline broths, the flakes are larger and coarser in character, and are visible to the naked eye floating about in an otherwise clear fluid. These larger flakes fall much more rapidly to the bottom, and leave the liquid clear, thus approximating to the condition of growth found in acid cultures. The membrane which forms on the surface varies in consistence: it may be thin and brittle, breaking up into fine dust or granules, when shaken; or it may attain a considerable and—as already mentioned

Production of toxin ceases when growth of Diphtheria bacillus colonies stops.

(1) *Beitrag z. K. des Diphtheriebacillus*, 1889, and *Centralbl f. Bakt. u. Parasitenk*, Bd. vi., 1889.

in the description of the preparation of toxin—even enormous thickness, and break up into flakes; or, again, it may be tougher in consistence, often descending intact to the bottom after the tube has been shaken. Not infrequently in films more than two days old a homogeneous membrane with round raised whiter spots scattered over its surface, like young colonies of the bacillus, as seen on the surface of serum, makes its appearance. The importance of this film-formation, or surface growth, in the production of strong toxin has already been discussed. Certain varieties of the bacillus give better film-growth than others, and are usually better toxin-producers. This luxuriant film-formation is a characteristic of well-growing cultures of the bacillus in a distinctly alkaline medium, and is never formed to any extent in cultures in a medium that gives an acid reaction.

Active toxin not always associated with luxuriant growth.

As pointed out by Madsen, however (1), a luxuriant growth is not invariably a sign that strong toxin is being produced: he holds that strongly alkaline atoxic cultures may have a dense pellicle, and he regards film-formation as appearing to be, in part at any rate, dependent on the original degree of alkalinity of the broth. There can be no doubt that unless the conditions be favourable to the growth of the organism at the very outset—*i.e.*, unless cloudiness and film-formation take place quickly—the toxicity of the culture is seldom high, whatever the growth may afterwards be like. In a broth culture that is almost neutral, or is slightly acid, the growth is slower, there may be a slight diffuse cloudiness; but usually granules are formed, which rapidly attach themselves to the side of the tube, and fall to the bottom as a thin whitish layer of sediment, the fluid remaining perfectly clear. After a short time a very thin membrane may form on the surface; but it is never very luxuriant, is tough in consistence, and falls to the bottom in flakes of considerable size. The broth always remains clear and bright, even after continued growth, and is never marked by the diffuse cloudiness due to the very fine or dust-like granules, or flakelets, characteristic of a growth in alkaline broth. In broths more acid in reaction the additional acid produced in the broth by the growing bacillus in its early stage may be sufficient to stop growth altogether. Madsen states that if a 5–8-days old acid culture be filtered through a Chamberland filter, and inoculated with a fresh culture of the diphtheria bacillus, an extremely sparse growth, if any, makes its appearance; if, however, before filtration the broth is neutralised with sodium hydrate, an abundant growth is the result, and the culture may become strongly alkaline and toxic; the same thing occurs if, instead of filtration, the fluid be sterilised by being boiled at 100° C. or placed in the auto-clave; and he argues from this that the toxin-production is absent not because the broth was without the substances necessary for its production, but because the strong acid produced hindered the further growth of the bacillus. Madsen, who made a microscopical examination of these acid cultures, found bacilli scattered very sparsely in the clear liquid; only in the sediment did he find them in large numbers, with their forms, as a rule, well preserved, even a year after inoculation, and with few granular degenerated forms such as are found in old alkaline cultures. Living and virulent bacilli, he says, may be found for many months, or even after a year, in these non-alkaline fluids.

The effect of acid on the cultivation.

All gradations between the fine diffuse cloudiness and the more flaky growth may be met with, and one and the same culture fluid may manifest first one condition and then the other; this being due, probably—in part, at any rate—to changes that take place in the broth as regards its reaction.

Cultivation of the Diphtheria bacillus in an acid or only slightly alkaline medium.

If the reaction of an inoculated alkaline broth be tested at intervals, the amount of acid will be found to rise rapidly in the first two or three days after inoculation (or it may even be limited to one day): *i.e.*, if the broth is strongly alkaline, the alkalinity will diminish; then comes a pause, and finally the broth appears to regain its original alkalinity, or in some cases the original point may even be passed. If the broth is acid, or only very slightly alkaline to begin with when it is inoculated, the initial acidification becomes so marked that the fluid never again becomes sufficiently alkaline to allow of its becoming a favourable medium for the growth of the diphtheria bacillus. This acid-production, during the first few days of growth, is very characteristic of the Löffler's bacillus, and it is now fully recognised that the broth in which a good growth of active toxin-producing bacilli is to be obtained must be sufficiently alkaline to begin with to allow of a temporary increase of the acid, and still have sufficient alkali present to prevent it losing its distinctly alkaline reaction; for if this acid reaction set in permanently all growth ceases. According to Roux and Yersin (2) a fresh weakly acid culture is only slightly toxic, it being found necessary to inject enormous doses (35 c.c.) intraperitoneally into a guinea-pig in order to bring about its death. Madsen, studying this question of alkalinity, found that broths requiring between 18·5 and 8·5 c.c. of normal soda to be added to a litre of the broth to make it give the red reaction with phenol-phthaleine, may become acid or remain alkaline; whilst all broths with an alkalinity above or below these figures will become exclusively alkaline or acid respectively; and he emphasises the importance, therefore, of starting with a sufficiently high degree of alkalinity in order to ensure a vigorous growth and the production of active toxin. He notes, too, that by the addition of carbonate of lime, as recommended by Spronck and Van Furenhout, (3) we can rely upon the broth remaining alkaline without its having in any considerable degree an influence on the quantity of toxin produced; but he adds that the growth of the bacillus seems to be very sparing, and that the fluid keeps exceedingly clear, but gives an abundant pellicle.

Madsen (op. cit.) was led to investigate some of the external conditions under which the preparation of toxin takes place in the endeavour to account for a curious fact—occurring more than once—of two cultures whose acid reaction he had repeatedly tested for months, suddenly undergoing a variation in that, whilst one continued acid, the other became alkaline and toxic without the occurrence of the slightest apparent change in the external conditions. He offers various explanations of this phenomenon, but none of them appear to be satisfactory.

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(1) *Experimentelle Undersøgelser over Difterigiften*, Copenhagen, 1896.
(2) *Annales de l'Inst. Pasteur*, ii.–iv., 1888–90.
(3) *Annales de l'Inst. Pasteur*, t. xix., 1895, p. 758.

The behaviour of the Pseudo-Diphtheria bacillus as it grows in broth.

The growth of the pseudo-diphtheria bacillus in broth is also vigorous and similar to that of the true diphtheria bacillus, but the diffuse cloudiness is more dense, sets in at an earlier period, and the broth clears up very much later by the deposition of a sediment. A constant difference is said to exist in the entire absence of acid-production in the early days of growth, so that an increase in alkalinity begins as early as the second or third day. This goes on increasing, at first slowly, but then more rapidly. This feature is said to be fairly characteristic, but is, in my experience, not to be relied upon absolutely.

The Determination of the Strength of Diphtheria Toxins.

The necessity for the standardisation of toxin.

One of the first difficulties with which we had to deal in connection with the injection of toxin into the horses under treatment was the approximate determination of the lethal activity of toxins. Although the same absolute accuracy is not here required as when the toxin is to be used for the purpose of standardising antitoxin, it was still necessary to have a fairly accurate idea of the material with which we were working in order that sufficiently large doses might be given to produce satisfactory results, but that large enough doses to produce deleterious effects on the horses should be avoided. At first, following Roux's work (1), it was thought that "weight of guinea-pig," irrespective of the age of the animals, would be a sufficiently accurate standard of measurement, and the 36 or 40 hour time in which the toxin would kill a certain weight was thought to be the best for our purpose. In all the earlier experiments the toxin was standardised by determining the amount that it was necessary to inject into a guinea-pig of 500 grammes weight in order to kill the animal in 36 to 40 hours. After working with this method for some time, however, it was found that somewhat variable results were obtained. When the dose was sufficiently large the animals were killed without fail, but there appeared to be a dose which would kill some animals within the prescribed period, whilst others, after receiving it, continued to live for a longer time. These variations appeared to depend upon the resistance of the animal rather than upon the nature of the toxin. Still this limit, although a somewhat wide one, was not so wide as to interfere with an approximate determination of the strength of the toxin, and it was only when definite information had been obtained on this point that the injection of the horses could be pushed with any confidence, and not until that stage was reached were we successful in obtaining even moderately active antitoxic serum.

Roux's method.

Behring and Ehrlich's method.

Soon after this, gaining access in the first case to Behring's, and later especially to Ehrlich's, records of their experiments on toxins and antitoxins, my colleague, Dr. Wood, and I were encouraged to continue along a line of work which we had already commenced for the purpose of determining more accurately the strength of diphtheria toxins. Our investigations, however, had not gone far when Ehrlich published his admirable work on antitoxic serum testing ("Die Werthbemessung der Diphtherieheilserums und deren theoretische Grundlagen," Klinisches Jahrbuch, Bd. vi., 1897). Both Behring and Ehrlich were convinced that the age of the guinea-pig played a most important part in determining the susceptibility to the action of the toxin, and that half-grown guinea-pigs varied less in their susceptibility to the action of the toxin than did older animals, and that the best size to use for all delicate or accurate estimations was an animal of about 200 to 300 grammes weight. Ehrlich's researches, too, made it clear that the period of 36 to 40 hours that we had taken as that in which an animal is killed with certainty by a definite dose of toxin was too short, and that more accurate results could be obtained if the lethal period was extended to the fourth day. It may be well, in describing our results, to adopt the nomenclature of Behring (2), who took as the standard toxin, toxin of such a strength that in every cubic centimetre there is sufficient lethal substance to prove fatal in four days to one hundred guinea-pigs, each weighing 250 grammes. This he speaks of as normal toxin, or toxin of normal strength, the formula for which he writes as D T N^1; any toxin higher than or below this strength is indicated by placing higher or lower figures in decimals after the D T N; thus D T N containing 10 lethal doses per centimetre would be written D T $N^{0 \cdot 1}$, while toxin containing 140 lethal doses per cubic centimetre would be written D T $N^{1 \cdot 4}$. This nomenclature is here used because it is very conveniently written, and also because it is now generally understood by those who are working at toxins and antitoxins.

The age of the test animal a most important factor.

Behring's nomenclature.

(1) Roux and Yersin, *Ann. de l'Inst. Pasteur*, tomes ii.-iv., 1888-90.
(2) Fortschr. d. Medicin, Bd. xv., 1897, p. 1.

RAPID METHOD OF PREPARING ANTITOXIN.

Variation and varieties of toxins.

As already pointed out, it soon became evident, as the outcome of our researches, that, in composition, toxins vary enormously as to their lethal activity as compared with what may be called their secondary activities, the result of the presence of substances which give rise to certain local changes on the one hand, and those that cause a rise of temperature and interfere with the nutrition of the tissues on the other. This has also been strongly insisted upon by Ehrlich, who insists that it is impossible to obtain what may be termed a *pure toxin solution*. There may be a rough proportional relation between the lethal "activity" and the local "activity" (swelling producing activity), but this proportional relation only obtains within comparatively wide limits; one toxin containing a considerable proportion of the substance which determines the local effect, but a smaller amount of the substance that causes death of the animal, whilst a second toxin which may set up slight local reaction may cause death in comparatively small doses.

Toxin a complex substance.

Cartwright Wood's experiments.

In connection with this question, Dr. Cartwright Wood early carried out a series of experiments on the production of antitoxins by the use of albumoses. Ehrlich [1], in connection with his study of this question, describes what he calls toxoids—substances which have the power of combining with an antitoxin molecule, and which also appear to have the power, under certain conditions, of combining with and stimulating the "lateral chains" of tissue cells, so as to lead to the production of anti-substances. We had observed—as had most of those who had worked at this subject—that the toxins that we used in our earlier testing experiments differed very considerably in the relation of their neutralising power and their absolute toxicity, and when using the ten theoretical lethal doses we were soon confronted by the fact that in certain cases complete neutralisation took place when only about three lethal doses were used, whilst in other cases complete neutralisation did not occur until the full theoretical ten lethal doses had been mixed with the antitoxin. Starting from the theoretical multiple of 100 instead of 10, Ehrlich, in his experiments, found that the absolute neutralisation point of one test unit of antitoxin varied from only 20 toxin units, on the one hand, to 120 on the other. He found, too, that the addition of carbon bisulphide to a powerful tetanus toxin so far modified the toxicity of this substance that he could introduce 0·5, or even 1·0 c.c. into mice without producing any apparent harmful effect. At the same time, there was set up in them, at the end of eight days, a marked immunity against tetanus toxin, although with ordinary toxin a similar result had only been obtained after a very prolonged period of treatment. This modified tetanus toxin, nevertheless, still retained the capacity of combining with the anti-substances and neutralising them much as they would the original toxin, and he came to the conclusion that he had thus obtained a substance which, although it had lost its toxic activity, still retained the specific power of combining with the anti-substances.

Effect of certain chemicals on toxins.

Sidney Martin's experiments.

Professor Sidney Martin, in a report to the Local Government Board ("Chemical Pathology of Diphtheria and of Infective Endocarditis; with an Account of Diphtheria Palsy, experimentally produced by the Chemical Poison of Diphtheria") [2], describes an albumose, or digested proteid, which was obtained from the blood and organs of diphtheria patients by a series of extractions with rectified spirit and cold distilled water, until nothing more dissolves. "The several extracts are mixed together, evaporated at 35° C. to a small bulk, and thrown into absolute alcohol. This precipitates most of the albumoses, some deutero-albumose remaining in solution. After standing, the alcohol is poured off, and the liquid evaporated to dryness at a low temperature, and the residue extracted by absolute alcohol, until nothing more dissolves. The residue left after extraction with alcohol is deutero-albumose with mineral salts." "It gives all the ordinary actions of proteids, and a well-marked biuret reaction. It is completely precipitated from solution by saturation with ammonium sulphate; nitric acid gives a slight precipitate, which is greatly increased if sodium chloride be added to the solution; in fact, this proteid powder is chiefly deutero-albumose, giving reactions similar to those of peptic deutero-albumose." Dr. Martin pointed out that there is also a strong organic acid formed in the blood and spleen of diphtheria patients; it is also present in considerable quantities in the membranes of the larynx and pharynx. When the powerful acid reaction produced by the diphtheria bacillus in broth is borne in mind, the presence of this organic acid in the situations mentioned might fairly well be anticipated. This acid is readily soluble in water, and in absolute alcohol, and is quite insoluble in ether, chloroform, and benzene, being thus readily distinguished and separated from the free fatty acids; it is a yellowish amorphous body, which becomes a deep brown on being made alkaline. Martin concludes, as the result of his investigations, that there are two classes of substances found in cases of diphtheria which are not found in the normal body; they are always associated, and are found in larger quantities in the spleen than in the blood. Although it is impossible to distinguish this albumose chemically from that formed in the course of peptic digestion, it exerts a perfectly distinctive physiological action upon animals. Injected subcutaneously, the diphtheria albumose produces a local œdema; the swelling comes on rapidly, may increase for twenty-four hours, and then disappear in thirty-six hours—a character that should be carefully borne in mind. Injected subcutaneously in quantities of 0·256 gramme per kilo., it causes only slight and irregular rise of temperature; injected intravenously into the rabbit, a well-marked rise of temperature is observed on the day of injection, followed by a slight degree of fever, lasting in some cases on to the fifth day. In another case, however, the injection of 0·122 gramme per kilo. produced a rapid fall of temperature, and death in three hours. The presence of this substance in the blood delays coagulation. Small multiple doses exert a very

Albumoses.

Organic acid.

Physiological action of these substances.

(1) Loc cit.

(2) Supplement Local Govt. Bd. Rep. 1892-3, p. 427, and Goulstonian Lectures on the Chemical Pathology of Diphth., *Brit. Med. Journ.*, 1892, vol. i., pp. 641, 696, and 755.

marked effect on rabbits. There is a rise in temperature lasting for seven days; this rise is slightly increased after a second injection (the whole quantity administered in two injections being 1·36 grammes per kilo.). On the third day paresis of the left hind leg appeared; on the fourth this was more marked, and the weight of the animal had fallen from 1,100 grammes to 930 grammes; on the sixth day there was paresis of all the limbs, especially those of the left side, and the animal died. In most of the other animals the rise of temperature was not continued beyond the second or third day. In every case paresis was a marked feature, as was also the loss of weight: the larger the amount of albumose per kilo., the greater the loss of weight, this being sometimes almost equal to one-half of the original body-weight.

Albumoses remain in the blood for some time.

These albumoses, according to Martin, remain in the blood for a very long period, as it was noted that the blood of a rabbit still coagulated slowly ten days after the injection of a small quantity of diphtheria albumose, this, it is maintained, indicating that some of the albumose still remained in the blood; and it is suggested that the presence of this substance for a considerable time after the acute symptoms of diphtheria have passed off may account for the occurrence of paralysis in the human subject. The injection of these albumoses was almost invariably followed by degeneration of certain of the nerves, the white substance of Schwann breaking up and disappearing in certain areas, an axis cylinder becoming attenuated and sometimes entirely interrupted. Below these segmental degenerations Wallerian degeneration occurs, and the muscle fibres become fatty. In some cases the substance of Schwann, only, disappears.

Nerve degeneration.

The organic acid is not nearly so toxic as albumose, but it exerts practically the same effects in a minor degree.

The poisons obtained from the membranes are of a similar character, but are more active, a much smaller dose producing somewhat similar results. The albumoses produced in a culture medium, consisting mainly of alkali albumen broth, also exert a very similar action.

Ferment in diphtheria toxin.

Martin considers further, however, that the *Bacillus diphtheriæ* has the power of producing a ferment, or enzyme—Roux and Yersin's poison—this, of course, being primarily formed in the local lesions by the diphtheria bacilli; that this ferment has the power of acting upon albuminous substances; and that, as they claim, it exerts a distinct lethal action. When allowed to act upon proteid or albuminous substances, this ferment appears to bring about the formation of albumoses and an organic acid, with the former of which we have here to deal. These substances are found in the blood, and, as already mentioned, accumulate in considerable quantities in the spleen. The albumoses have the properties of being able to cause œdema, with some local swelling, which rapidly passes off, the rise of temperature varying in degree and in permanence; it also brings about degeneration of the nerve fibres. It has, however, a comparatively slight lethal action, as considerable doses are necessary to cause death.

Wood applies albumoses to the preparation of antitoxin.

Working from this basis, Cartwright Wood (1)—who, with Hueppe, had previously pointed out that in order to obtain the toxins proper of the microbe it is necessary to supply them with albumen—first obtained an active growth of the diphtheria bacillus in a broth containing about 10 or 20 per cent. of horse serum, or decalcified plasma (kept perfectly sterile), in order that, in addition to the enzyme, or ferment toxin produced from the broth, there might also be formed from the dilute albumen, albumoses, corresponding, probably, to those obtained by Martin. In order to obtain an active growth of the bacillus, the broth, in a 2-litre flask or Winchester quart bottle, is inoculated with a virulent culture a day or two before the serum, or plasma, is added; after the addition the culture so made is incubated for at least three or four weeks, being well shaken daily for the first three or four days; sometimes additional serum, or plasma, is added, after which the mixture is re-inoculated at the end of this period. The best results appear to have been obtained when this was repeated several times and the growth allowed to go on for three to six months. The culture is then subjected to a temperature of 65° C. for at least an hour. By this means the ferment toxin, or enzyme, is destroyed, so that when the bodies of the bacilli have been removed by filtration a fluid is left containing substances which have very little lethal activity, and give rise to little local irritation, though it sets up "marked febrile reaction, which is still more pronounced when the injection is repeated." Wood says: "As the diphtheria albumose described by Sidney Martin was characterised by precisely these properties, in all probability the potency of the serum toxin depends on its presence." More important still, however, it was found that, just as in the case of the tetanus toxin to which bisulphide of carbon had been added, although it had lost its lethal activity, it still retained the property of rendering animals more or less refractory to the action of diphtheria toxin—a fact that "suggested the possibility of its application as a means of shortening the preliminary treatment which a horse must undergo before it can receive the large doses of broth toxin which are usually necessary for the production of antitoxin of any strength." On applying this method it was found that not merely was immunity produced, but there was actually formed a considerable quantity of antitoxin, and a horse which received 2,180 c.c. of serum toxin in the course of a fortnight yielded a serum containing 50 units per c.c., whilst at the end of a month after the injection of a mixture of the serum toxin with comparatively weak ordinary toxin in small amount, the serum of the horse had risen in antitoxic value to 125 units per c.c.

The effect of cumulative action in the preparation of potent antitoxic sera.

Wood found (as we had observed in connection with another series of experiments (2)) that he obtained the best result when a kind of cumulative action was maintained (but not carried too far) by means of which the animal was kept in a chronic condition of local and constitutional reaction, and he demonstrated the possibility of obtaining potent antitoxins much more rapidly than by any of the means hitherto described. He concludes (1) "that powerful diphtheria antitoxins can be produced without risk in a much shorter period of time than has been previously

(1) *Proc. Roy. Soc.*, 1896, vol. lix., p. 290
(2) *Lancet*, 1890, vol. i., p. 393

possible; (2) that much more powerful antitoxins can be easily produced, so that the amount necessary to be injected into a patient can be greatly reduced, and one of the great objections to its introduction into private practice in this country may be removed; (3) that the greater strength of the serum will permit of the patient receiving at the beginning a sufficient quantity of the serum at one injection, when, as is universally recognised both by animal experiment and clinical experience, its curative action is exerted most markedly."

Method of preparation of Wood's serum toxin.

A bouillon cultivation of the diphtheria bacillus is made in a flask holding from 1 to 2 litres. Winchester quart bottles, or ordinary thick narrow-mouthed white glass bottles holding from 2 to 2½ litres, have been used in this work. Into each of these, sterilised and plugged with cotton wool, 1,500 c.c. of peptone broth neutral to phenol-phthaleine is decanted, and the whole sterilised. The broth is then inoculated with a vigorous culture of the diphtheria bacillus, which is allowed to grow for twenty-four hours. If the growth be sufficiently vigorous, 300 c.c. of horse serum kept absolutely sterile is added by means of a large sterile pipette; the flask is then replaced in the incubator. In place of serum, citrate plasma may be used. In this case, however, it is necessary to remove all lime from the broth by means of the addition of oxalate of soda and subsequent filtration. The bottle is well shaken daily for several days. A vigorous growth of the diphtheria bacillus continues to take place, and a grey deposit of considerable thickness is gradually formed. From time to time a fresh quantity of serum, and also of a fresh vigorous culture of the diptheria bacillus, may be added. The best results appear to be obtained when this growth is allowed to remain in the incubator for a very considerable period—a month or two, or more—as in this case it is not necessary to maintain the active lethal toxicity of the broth. When there appears to be a deposit of sufficient thickness—it may be half an inch, or even more—the fluid is placed in a large thin flask which is immersed in water, kept at about 65 to 68° C. A thermometer is fixed in the neck of the flask so that the bulb is in the centre of the mass of fluid. As soon as the thermometer in the flask registers 60 to 65° C. the time of the exposure to this temperature is noted, the heating now being continued for one hour. The diphtheria bacilli are thus killed, whilst in addition the serum toxin, which, in the first instance, had a lethal activity of perhaps from D T $N^{0 \cdot 1}$ to D T $N^{0 \cdot 25}$, no longer contains a sufficient amount of lethal toxin in 3, 4, or even 5 c.c. to kill a guinea-pig of 250 grammes. The heated fluid is now allowed to stand for some time until the bodies of the bacilli have again fallen to the bottom, after which the clear supernatant fluid is decantered and filtered through Chamberland or Berkefeld filters. This preliminary filtration takes place exceedingly slowly, and it is sometimes necessary to have a large battery of filters in work at once. It is, however, unnecessary to take very great precautions as to sterility, &c., with this preliminary filtration, so that any old filters, or pieces fitted up with india-rubber bungs, may be used. The final filtration, however, is carried on with the ordinary precautions and with clean sterile filters. This fluid, if sterile, may be kept for very long periods, and it does not appear to lose its power of setting up the antitoxin-producing reaction in anything like the same degree as does ordinary toxin grown without the excess of albuminous fluid.

The diphtheria bacilli killed by heat and removed by filtration.

Injection of Horses with Toxin, etc.

Apparatus used for injecting the horses.

During the earlier periods of our work, when only small quantities of toxin were used, hypodermic syringes containing some 20 or more c.c. could be used, but it was soon found that with the weak toxin at our disposal some more convenient and rapid method must be adopted. With the assistance of Dr. Wood and Mr. Doudney the following apparatus was devised. A strong glass flask, with a fairly square shoulder and a narrow neck, is fitted with an india-rubber bung through which a couple of holes, to receive glass tubes, are pierced. Into one of these is introduced an angle tube (at first glass, later metal was used), the end of which goes down to the bottom of the bottle; to the other limb, turning at right angles, is fitted a piece of strong india-rubber tubing. Into the other end of this india-rubber tubing is fixed a hypodermic needle, fitted into a strong metal bulb, grooved so that the india-rubber can be firmly wired on to it. Into the other hole of the bung is fitted a short tube, bent at right angles, one limb of which just passes through the bung, the other having wired over it another piece of thick india-rubber tubing to which, at the other end, is wired a two-way air-pump, by means of which considerable pressure may be obtained and maintained within the bottle; screw-clips are fitted on to each of the india-rubber tubes, one immediately behind the needle, so that the tube may be closed before the needle is withdrawn from the subcutaneous tissue, and one near the air-pump to prevent leakage when the pump is not being worked, but after the pressure has been raised. This bottle, after being filled with toxin, is placed in a strong wooden box without a lid, the upper edge of the box coming about a quarter of an inch above the lip of the mouth. In each side of the box is a slit through which the bottle can be seen, this slit commencing at the bottom and running up to the level of the shoulder of the bottle. On either side of the top of the box strong steel eyelets are firmly screwed; through these a steel rod is passed, over the india-rubber cork and between the two tubes; the bung is thus held in position, and any leakage is prevented, even when considerable pressure is applied. Down each side of the slit is a scale, marking off from above downwards the amount of fluid contained in the bottle. In this way, commencing at the top, the amount of fluid injected may be measured with the greatest accuracy so long as the bottle in its box is kept in an upright position.

Measurement of the fluid injected.

Seat of injection.

Most of the injections of toxin are made subcutaneously in the side of the neck or in front of the shoulder, but in certain cases the injections were made directly into the veins or into other parts of the animal. The neck, however, is found to be far the most convenient position in which to make the injection. It has been found necessary to take the greatest care to have the skin of the animal thoroughly clean and washed with antiseptics before injections are made; whilst, in between the injections, every part of the injection apparatus, after being

Abscesses rarely occur.

thoroughly washed, is kept in carbolic acid or creosol. In most cases there has been absolutely no trace of any abscess formation, but whenever an abscess had once formed in a horse it has been necessary to leave that animal alone until all trace of suppuration has disappeared; unless this be attended to, a fresh abscess may follow each fresh injection.

Caused by very strong toxin.

In certain cases, when extremely strong or concentrated toxin has been used, a slough has formed. Similar sloughs have also made their appearance in one or two cases where toxin made from fermented meat was used, and, in one or two instances, where carbolic acid had been used for the preservation of the toxin.

The causes of abscess formation.

In none of these cases could any bacteria be found in the toxin, and the same precautions were taken to avoid any external contamination as in those cases (to which these were the exception) in which the absorption of the toxin went on regularly and quietly, and typical local and constitutional reactions were obtained.

Quantities of fluid injected.

As will be seen from the charts, the quantities of toxin and serum toxin injected may vary from half a cubic centimetre to a litre or more. Where the larger quantities are injected it is found necessary to divide the dose into two or more portions and inject them at different sites. Quiet, good-tempered animals will often stand quiet throughout the whole time that the injection is being made, but in the case of nervous or irritable horses it is found necessary to adopt some means of keeping them from throwing the head about and from rearing during the injection.

The restraint of restive horses.

Various measures have been resorted to, but by far the best has been found to be strong stocks or a wooden frame to which may be attached webbing, passed over the withers, under the belly, and over the quarters. Nothing seems to irritate nervous horses so much as the working of the hand-pressure pump, and in any future apparatus I should arrange to have this, or a foot pump, screened off both from sight and hearing of the horse being injected. In the stocks, with the webbing properly applied, the horse can scarcely be a source of danger either to itself or to the operator, but on one or two occasions, when the webbing and straps were not properly applied, the horse under operation has had a narrow escape from injuring itself. From first to last, however, not a single horse has injured itself beyond a slight scratch.

Explanation of curves and blocks on charts.

An attempt has been made in the accompanying charts (p. 125, *et seq.*) to indicate the number of injections and the nature and quantity of the injected substances, the rise of temperature and the period at which it resulted, the amount (1) and persistence of the swelling, and the antitoxic value of the serum resulting from this method of treatment.

Temperature reaction.

The injection of a dose of toxin capable of producing reaction is very rapidly followed by a rise of temperature, which appears to attain its maximum in eight to twelve hours and then to fall rapidly, seldom continuing beyond the first 24 or 36 hours; in some cases, however, the temperature does not become normal even in this time.

Local reaction. Subcutaneous swelling.

The subcutaneous swelling seen when the toxin is injected appears in the first instance to become less marked, but this may be due to the gradual disappearance of the sharp outline bounding the swelling. Along the course of the veins, over and around the swelling, distinct prominent lines make their appearance. Whether these are due to distension of the veins as the result of local alteration of the venous pressure, or to the distension of the lymphatics as the retained toxin is absorbed, it is difficult to state. Within a few hours a very marked swelling makes its appearance around the mass of fluid injected. Our endeavour should be to obtain such a swelling, of at least the size of a soup plate. Sometimes the swelling is greater than this, and if the injections are too large, or pushed too rapidly, the swelling may extend from the neck and shoulder down into the upper part of the foreleg. At first this swelling is usually œdematous and soft, and the bulk of it, as will be seen on reference to the various charts, rapidly disappears. It usually, however, leaves a somewhat firmer swelling which, disappearing more slowly, is seen in the course of two or three days as a firm, hard nodule of the size of a walnut immediately under the skin at the site of injection.

General health of horses properly treated is little affected.

Immediately after injection, usually at night, the horses, as a rule, lie down for a short time, but then continue to eat and drink until the temperature and swelling attain their maximum. The morning after injection, except in very rare cases, the animals are ready for their food, and appear to be little troubled by the injection.

Effects of exercise.

As the animals have no regular work it is found necessary to give them daily exercise in the tan ring (see Plan, Fig. 2). It is found that if this exercise is too violent, or is given too soon after the injection, the swelling is very materially increased in size, and it is specially in those animals that have been exercised too soon or too violently that the swelling "drops" from the neck and shoulder to the legs.

(1) In the charts, the first of which is at p. 125, the shading of squares black is intended to give an approximate indication as to the size of the swelling obtained after injection with diphtheria toxin, etc. Half a square shaded represents a swelling about the size of a walnut; a whole square, a swelling the size of an egg or of a small orange; two squares, a swelling the size of the hand; three squares, an area of swelling six inches by six inches; four squares, ten inches by ten inches; five squares, a swelling of considerable size extending beyond this; and six, a very large swelling, usually extending down into the fore limb. In determining the numbers of squares to be shaded, the height or depth of the swelling, as well as its superficial area, is always taken into consideration.

METHOD OF DRAWING BLOOD FROM HORSES.

Apparatus required.

Apparatus, &c., required :—

A 2 per cent. solution of lysol.
A 10 per cent. solution of citrate of soda thoroughly sterilised by boiling.
A 1 per mille solution of bi-chloride of mercury.
A 5 per cent. solution of carbolic acid in a large open-mouthed jar, with glass stopper.
Several large scalpels. ("Breast" knives with metal handles are the best adapted for the purpose.)
Trochar, cannula, and plug with bayonet joint, $\frac{3}{16}$ in. bore.
Two 3-ft. lengths of india-rubber tubing, of bore larger than that of the plug of cannula.
Glass tubing 10 in. long, $\frac{1}{4}$ in. to $\frac{5}{16}$ in. bore.
Another piece glass tubing 6 in. long, $\frac{1}{4}$ in. to $\frac{3}{8}$ in. bore.
Large Bunsen burner with which to heat water in a large enamel pan for sterilisation of knives, cannulæ, &c.
Glass beakers, without spouts, to hold 800 to 900 c.c.
Wooden "butler's tray" to hold at least one dozen of these beakers.

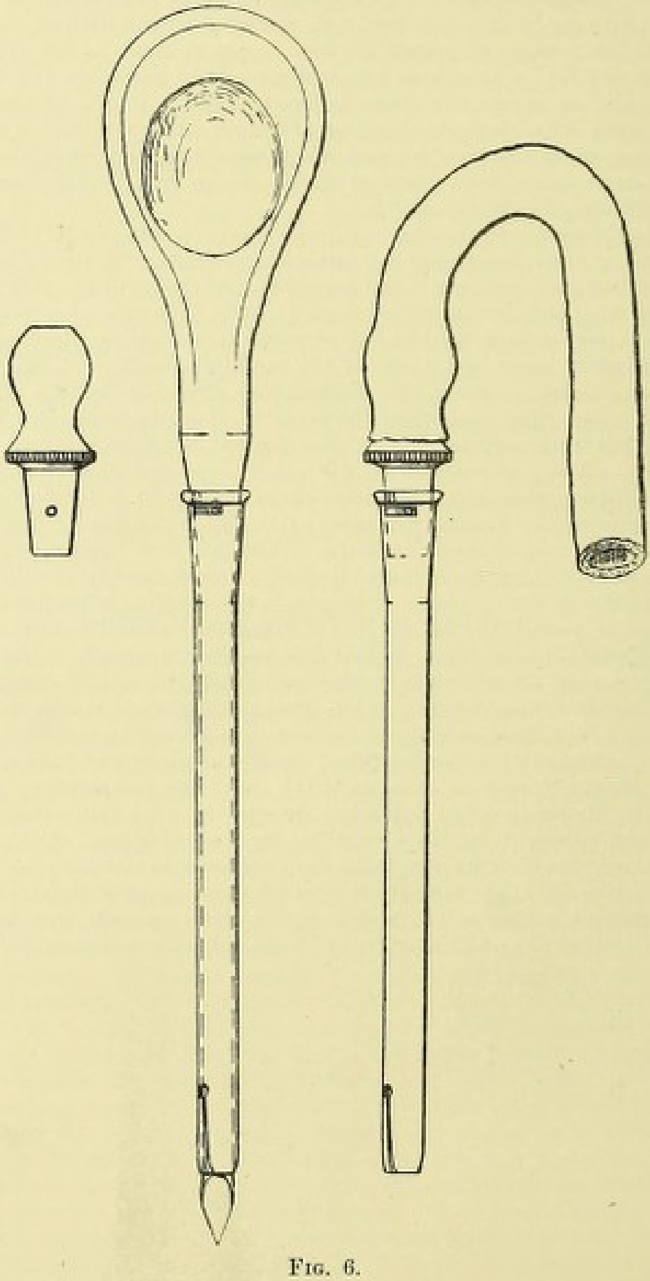


FIG. 6.

PLUG WHICH FITS CANNULA BY BAYONET JOINT. TROCHAR AND CANNULA. CANNULA FITTED WITH PLUG TO WHICH INDIA-RUBBER TUBE IS ATTACHED.

Preparation of glass beakers.

The glass beakers (Fig. 7) are first thoroughly washed; they are then covered with a layer of stout parchment paper (B), which is tied in position with strong twine and trimmed neatly about half an inch below the twine all round. A second layer of parchment paper (C) is then tied in position and left untrimmed, in order that when it has to be removed it may be at once distinguished from the first layer. These prepared beakers are thoroughly sterilised in a steam steriliser, being left there for at least an hour on two successive days, after which they are ready for use.

Sterilisation of skin.

About half an hour before the bleeding is to be done the skin around the point in the jugular furrow, in which the incision is to be made, is thoroughly washed with 2 per cent. lysol solution; a towel wrung out in the fluid may be left to form a kind of compress over this part, though this is scarcely necessary unless the surroundings are very bad.

The pan is then filled with distilled water, which is brought up to boiling point.

Tube—india-rubber and glass.

The two lengths of india-rubber tubing and the glass tubes—which, when not in use, are kept in the jar containing 5 per cent. solution of carbolic acid—are then fitted together, the 6-in. tube being placed between the two 3-ft. lengths of india-rubber tubing, and the 10-in. glass tube pushed for about four inches of its length into the other end of one of the india-rubber tubes. The free part of this glass tube is left for the purpose of passing through a hole in the paper (see below), the part within the india-rubber tubing offering a firm portion which is easily grasped. Into the free end of the other india-rubber tube is inserted the nipple portion of a hollow plug which fits by a bayonet joint into the cannula. The cannula is about $3\frac{1}{2}$ in. long, and has a bore of $\frac{3}{16}$ in. in diameter.

Trochar and cannula.

The trochar, $6\frac{1}{2}$ in. in length, has a spear-shaped point which must always be kept well sharpened. It also has a large flattened handle ($2\frac{1}{2}$ in. long and $1\frac{1}{4}$ in. broad) by which it may be firmly gripped (Fig. 6). The trochar and cannula, after being plunged into the boiling water, are cooled down in a solution of lysol, which is best contained in a round glass battery jar with a piece of india-rubber sheeting at the bottom to protect the points of the knives and trochars. The knives are similarly plunged into boiling water, and are then placed in the lysol along with the other instruments.

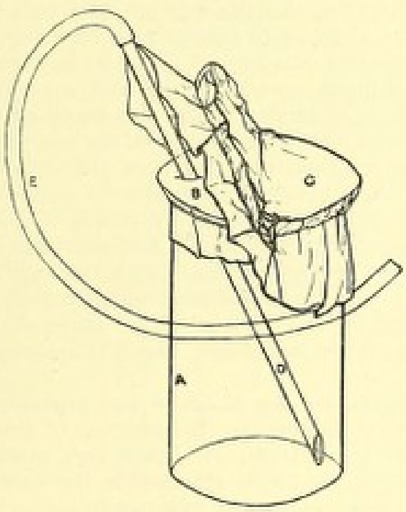


Fig. 7.

A—Wall of beaker.

B—Inner layer of parchment paper.

C—Outer layer of parchment paper.

D—Glass tubing (over which the india-rubber tubing has not been pushed far enough).

E—India-rubber tubing.

The fitted-up india-rubber tubing, with the plug for the cannula, is allowed to remain in the boiling water until a few minutes before it is required for use.

Addition of citrate of soda.

Into each of the prepared beakers which are to receive the blood 6 or 7 c.c. of the 10 per cent. solution of citrate of soda is pipetted. In order to do this, the twine holding the outer layer of parchment in position is cut; one edge of the parchment paper is then carefully raised, and with a sterile knife a small opening is made into the second layer of parchment paper (see Fig. 7); through this opening a sterile pipette containing the sterile citrate solution is introduced; when the required quantity has been discharged the pipette is withdrawn, and the displaced portion of the outer layer of parchment paper is carefully replaced.

Blood is drawn from the jugular vein.

The india-rubber tubing is now taken from the hot water and is cooled down in the lysol solution. Everything is now ready for the bleeding. If the horse to be bled is not a nervous animal, a groom stands at his head holding an ordinary bridle; but if the animal is at all nervous or irritable, it may be necessary to put on a twitch to keep him from throwing his head about when the preliminary incision is made. An assistant then places his hand in the jugular furrow, as low down as possible. As he presses gently in the line of the furrow the jugular vein may be seen to fill from below upwards, forming a large cord-like swelling, which may be followed from the point of pressure upwards almost to the angle of the jaw. Having marked the position of the vein in this way, a single incision about $\frac{1}{2}$ in. to $\frac{3}{4}$ in. long is made along the line of the vein some 6 or 7 in. below the angle of the jaw.

The operation is almost painless.

If the knife is sharp and the incision be made at one stroke, the horse as a rule does little more than twitch the skin of the neck. Once this incision is made the animal feels absolutely nothing, and will stand perfectly quiet during the remainder of the operation. Having the vein thoroughly distended by means of the pressure exerted by the assistant, the cannula, with the trochar in position—the latter being as sharp as possible—is pushed firmly and steadily into the vein, care being taken to pass the trochar in such a direction that it does not simply follow the sheath of the vein, but goes obliquely into the vein itself and at some little distance from the incision. If the finger be kept over the vein whilst the trochar is being pushed home one can tell at once when the vein has been pierced, but apart from this a sudden gush of a few drops of blood from the end of the cannula and around the trochar indicates that the trochar has gone home.

Manipulation of the tubing, &c.

In the meantime another assistant brings the india-rubber tubing with the hollow plug attached. The groom at the head of the horse withdraws the trochar, and the plug is immediately pushed home into the cannula and rotated, the bayonet joint holding everything in position. The blood is seen to pass through the first, or connecting, glass tube, and as soon as it makes its appearance in the second, or lower, glass tube (D of Fig. 7), the india-rubber tube is pinched with the finger until the tube can be introduced into the beaker. This is done by a second assistant, who raises one part of the outer layer of parchment paper and introduces the glass tubing (Fig. 7, D) (of which he can take firm hold by the part inside the india-rubber tubing) into the small hole previously made in the inner layer by which the citrate solution was put in. All this should be carried out as quickly as possible, in order that coagulation of the blood in the tube may not take place; in fact, it is better to have the glass tube in position in the beaker before the plug is introduced into the cannula, in which case, of course, it is unnecessary to pinch the tube at all. When about 750 c.c. of blood has run into the beaker the tube is pinched with the fingers; the glass tube is introduced into a second beaker; and so on until from 12 to 14 or 16 beakers—according to the size and condition of the horse—are filled. As soon as enough blood has been obtained the cannula is withdrawn, the pressure on the vein is removed, and the bleeding immediately stops. Press the margins of the incised skin together, wash with lysol, give the animal warm gruel or a warm mash and a feed of oats; no further treatment is required.

Cleansing of the "bleeding" apparatus.

The tube, trochar, and cannula are all put into cold water, the parchment paper covers are held in position by means of india-rubber rings, the name of the horse and the date of the bleeding are written on this outer cover, and the beakers are put aside in a cool dark cupboard. The glass tubing and the plug are then removed from the india-rubber tubing, and each part is thoroughly washed out—the glass tubing and the nipple by means of iron rods with cotton wadding attached, the 3-ft. lengths of india-rubber tube by means of a long iron rod to which a thick piece of string is tied: this, drawn backwards and forwards through the tube, removes all fragments of clot; and, after one or two washings with cold water to thoroughly clean out the various parts, india-rubber and glass are transferred to the carbolic acid solution, or are again put into the boiling water if required for use the same day. Three of these sets of tubing and cannulæ are generally kept in use, as we have sometimes found it necessary to do as many as five or six bleedings in one day.

The separation of the serum from the clot.

Now, turning our attention to the blood in the beakers, we find that before the blood clots—a process that is somewhat delayed by the addition of the citrate of soda—the red blood corpuscles have time to fall to the bottom, so that a very much exaggerated "buffy" coat is formed. At first the clot appears to be firmly attached to the walls of the beaker, but after a short time it will be noticed that the serum begins to separate out as a clear straw-coloured fluid, and at the end of 24 hours the clot, which is firm and comparatively pale, has become retracted from the walls of the beaker; it has also contracted longitudinally, so that it is now below the surface of the serum, whilst all around it is a clear yellow serum. So perfect is the separation of the red blood corpuscles during the early process of sedimentation previous to coagulation that, although the pale upper part of the clot is almost leathery in substance, the lower part has a consistence about equal to that of blackberry jelly—a substance which it very much resembles in appearance. It is, however, firm enough, or has sufficient of the paler clot on its upper surface, to keep any of the red blood corpuscles from getting into the serum.

By this method nearly one-half of the bulk of the blood is withdrawn as serum at the end of 24 or 48 hours; whilst, if the clot be allowed to stand for a day or two longer after the first batch of serum has been removed, another 5 or 10 per cent. may be withdrawn.

The serum drawn off after a few days is usually slightly tinged with hæmoglobin.

Amount of blood withdrawn.

In order to determine fairly accurately the amount of blood taken from each horse in proportion to its weight, the horses were weighed. A series of weighings of 18 beakers, full and empty, gave the average amount of blood drawn into each beaker as 808 c.c.; of this blood, the clot weighed 426 c.c.—or 47·3 per cent. of the blood withdrawn—and the serum, at the end of 48 hours, 382 c.c. As we had by far the most constant weighings at this time, I have taken them as representing the amount of clot and the amount of serum from each horse; but, as previously noted, from 20 to 40 c.c. of serum could usually afterwards be withdrawn, so that more than half of the blood was obtained in the form of serum.

About half of blood separated out as serum.

In the following Table are given the weights, the amount of blood withdrawn, the proportion of this blood to the body-weight of the animal, and the proportion that it formed to the whole of the blood in the body.

TABLE CIX.—Showing weights of nine of the horses under treatment, the amount of blood and its proportion to the body weight and to the whole of the blood in the body. (This latter figure is calculated on the basis that the blood forms $\frac{1}{13}$th of the gross weight of the horse.)

Horse.	Weight of Horse in kilos.	Amount of blood withdrawn in kilos.	Proportion of blood taken to whole of body weight.	Proportion of whole of blood in body.
"Brown Pony"	382	12·3	$\frac{1}{31}$	$\frac{1}{2·3}$
"Bay Mare"	447	13·1	$\frac{1}{34}$	$\frac{1}{2·6}$
"Dun Cob"	487	13·9	$\frac{1}{34}$	$\frac{1}{2·6}$
"White-Faced Bay"	522	13·1	$\frac{1}{40}$	$\frac{1}{3·1}$
"Brown Cob"	398	9·0	$\frac{1}{44}$	$\frac{1}{3·4}$
"White-Faced Mare" . ..	500	11·5	$\frac{1}{43}$	$\frac{1}{3·3}$
"Bay Horse"	423	13·1	$\frac{1}{32}$	$\frac{1}{2·5}$
"Brown Mare"	474	8·3	$\frac{1}{32}$	$\frac{1}{4·4}$
"Big Bright Bay Mare"	521	13·1	$\frac{1}{40}$	$\frac{1}{3·1}$

The amount of serum obtained at the end of 48 hours may be taken as about 47 per cent., an amount increased by 5 per cent. to 10 per cent. during the next two or three days. It must be borne in mind that on some occasions the amount of serum obtained was considerably below this average, and on others in excess of it. By careful observation, however, and by regulation of the amount of citrate of soda added, this average was fully maintained. Percentage amount of serum obtained from the blood.

The method of calculating the amount of serum obtained from the blood is exemplified in Table CX. The beakers were first weighed; they were then filled with blood and weighed; after the serum had been withdrawn at the end of 24 hours, they were again weighed; and again when the second batch of serum had been taken at the end of 48 hours. The difference between the final weighing and the first weighing gives the amount of serum obtained. This was repeated with two other sets of beakers of six each, at other dates, with results practically the same.

TABLE CX.

	Weight of Beaker, in grammes.	Weight of Beaker filled with blood, in grammes.	Weight of Beaker after first batch of serum is withdrawn, in grammes.	Weight of Beaker after second batch of serum is withdrawn, in grammes.	Weight of Blood, in grammes.	Amount of serum obtained, in grammes.	Amount of clot left, in grammes.
1	140	930	672	582	790	348	442
2	125	942	617	552	802	375	427
3	125	897	657	592	747	305	442
4	125	982	672	557	842	425	417
5	135	982	622	547	842	435	407
6	115	962	624	560	822	402	420
TOTAL ..	765	5,695	3,864	3,390	4,845	2,290	2,555
AVERAGE .. (Approximate)	127	949	644	565	808	382 or 47·3 per cent. of whole blood.	426

It is a matter of considerable importance to determine the exact quantity of citrate of soda to be used in each case. If too small a quantity be added to the blood, the clot forms too rapidly and the red blood corpuscles have not time to pass to the bottom of the vessel. They become entangled in the lower part of the clot, and by their presence prevent the full retraction of the clot, and less serum is squeezed out—the white firm clot forming a comparatively small proportion of the whole. If, on the other hand, too large a quantity of the citrate be added, we simply obtain a deposition of the red blood corpuscles from the plasma—a citrate plasma—and, at a later stage, on the addition of the antiseptic, if dissolved in ordinary tap water (which, of course, contains lime) and in some cases on merely allowing the plasma to stand for some time, a gelatinous clot may be formed either in the plasma in bulk or when it has been decanted into the small bottles. When this has happened while the plasma is still in bulk, the only plan is to shake the mass thoroughly or break up the gelatinous clot with a sterile glass rod—the fibrine being thus separated from the serum. This, however, is both a troublesome and a somewhat wasteful method of separating the serum, though the serum so obtained is beautifully clear and limpid, and never contains a trace of red colouring matter. It was found necessary in the case of certain horses to increase or diminish the amount of the citrate solution to be added to the blood, in order to obtain the best results, but as a general rule the quantity above mentioned—5 to 6 c.c. for each 750 or 850 c.c. of blood—gave the best results by delaying the coagulation just sufficiently long to allow of the thorough separation of the red blood corpuscles, but not interfering with the ultimate process of clotting of that part of the blood from which the red corpuscles had been separated; indeed, when the proper amount was used the upper pale portion of clot was invariably much firmer, smaller, and had driven out more clear serum than when no citrate was used. The next process is to separate the serum from the clot. For this purpose a large conical filtering flask of from 3 to 5 litres capacity (Fig. 8) is fitted with an india-rubber bung through which passes a piece of glass tubing (B); this projects $1\frac{1}{4}$ inches beyond the

The use of citrate of soda.

Amount of citrate to be added.

Separation of the serum from the clot.

bung, and then passes to within $\frac{1}{4}$ inch of the bottom of the flask. The upper orifice of the tubing is plugged with a piece of clean cotton wadding (A). To the lateral tube of the flask is wired a piece of india-rubber tubing (E) into the outer end of which is fitted a piece of glass tubing (D) slightly constricted in the middle and closed at the outer end by a plug of cotton wadding. On the india-rubber tubing is fixed a pinch clip (C). This flask is thoroughly sterilised in the steam steriliser (Fig. 9). In order to fill it, one of the 3-ft. pieces of india-rubber tubing described as being used in the process of bleeding is fitted (Fig. 9, D) on to the tube passing through the india-rubber bung, the plug of cotton wadding having first been removed. The 10-in. glass tube (Fig. 9, E) is inserted into the free end of this india-rubber tubing as in the toxin injecting apparatus (see p. 112). An exhaust pump (a brass hand air-pump) (B) is fitted with another length of the india-rubber tubing, the free end of this being fitted on to the glass tubing connected with the lateral tube (C) of the filter flask. In this case the plug of cotton wadding is left in the glass tube, as it serves to filter air that may make its way back from the air-pump. Everything being now ready, the india-rubber band is removed from the top of one of the beakers (Fig. 9, F) containing the blood clot and supernatant clear serum; the outer layer of parchment paper (G) is carefully raised where it covers the small hole through which the blood was introduced into the beaker; into this hole the glass tube (Fig. 9, E) is again carefully introduced, the beaker being held in the left hand and the india-rubber tubing above the glass tube in the right. The assistant now removes the clip attached to the india-rubber tube on the lateral tube of the flask, and works the pump so that the air in the flask is partially exhausted.

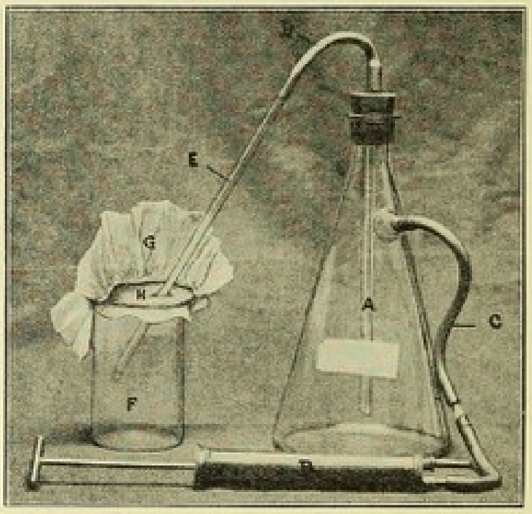


Fig. 9.

A—Conical filter flask with glass tube running to the bottom.
B—Exhaust (air) pump, to which is attached C, India-rubber tubing, leading to the lateral tube of the flask; D, India-rubber tubing; and E, glass tube, from flask to beaker, F.
G—Outer, and H, inner, parchment paper covers.

The serum immediately begins to run into the flask. Should the exhaust be too great, it will be necessary to compress with the forefinger and thumb the india-rubber tube (Fig. 9, D), just above the glass tube that is in the beaker, otherwise portions of the clot may be drawn into the tube, and so block it; whilst, as the last drops of serum are being drawn up, there is great danger, unless the pressure is carefully regulated, of sucking up the soft jelly-like mass of red blood corpuscles. If even a small portion of this gets into the serum, the blood-staining may be very marked. By the exercise of a little care, however, and by controlling the rate of flow of the fluid into the flask, such an accident can always be avoided. The glass tube is then withdrawn, the cover carefully replaced and kept in position by the elastic band. Another beaker is emptied in the same way, and so on until the flask is full. By this method the serum is drawn from the beakers into the sterile flasks without ever coming into contact with the outer air, and the antiseptic is added to a fluid which is itself aseptic. All these flasks are graduated every half-litre, so that the quantity of serum collected in each may be easily determined.*

Storage, Preservation, and Distribution of Antitoxic Serum.

Preservation of the serum by antiseptics.

For each litre of serum there is measured into a tall glass graduated measure 30 c.c. of a 6 per cent. emulsion of trikresol; this is drawn into the flask just as is the serum, the flask being kept constantly shaken so that the trikresol may be well mixed with the serum. The clip is then replaced on the lateral india-rubber tube (Fig. 9, C), and a wad of sterile cotton wadding is placed over the end of the tube, passing through the bung of the flask, this wad being kept in position by means of an india-rubber band. The air-pump tube is removed, and the flask is labelled and set aside in a cool dark place until it is to be decanted. The "strength" of the serum is determined as soon as possible.

In place of closing the flask as above, the small glass tube (Fig. 8, D) may be withdrawn from the lateral india-rubber tube (Fig. 8, E) the end of which is fitted over the end of the glass tube (A) passing through the bung; this, of course, closes the plug completely.

* The marking is done by means of hydrofluoric acid in solution.

If the serum is not to be used at once, the flask is transferred to a cool dark room; but no special precautions beyond keeping out light and heat are, as a rule, required. When kept in bulk the serum appears to retain its strength for a much longer period than when it is decanted into small bottles—in this way behaving very much as does toxin; for this reason it is deemed advisable to keep the serum in bulk until shortly before it is sent to the hospitals. If the serum from a single horse is to be used at once, a clip (Fig. 10, E) is placed on the lateral india-rubber tube (D), the bung is firmly tied in with twine, and the flask (A) is inverted and held in a wooden frame (B), where it is left for 24 hours. If the flask is not too full the central glass tube (K) should project above the surface of the serum so that none can pass out except by the lateral tube, which, of course, is closed by means of the pinch or screw clip. At the end of 24 hours there is found in the neck of the flask a deposit, sometimes greyish, sometimes of a pinkish or strawberry and cream colour, sometimes of a dark red. Storage of antitoxic serum.

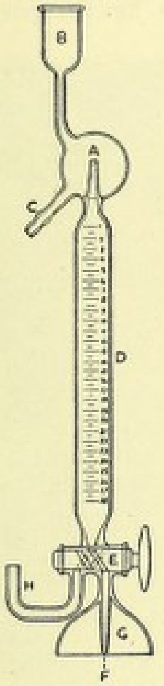


FIG. 11.

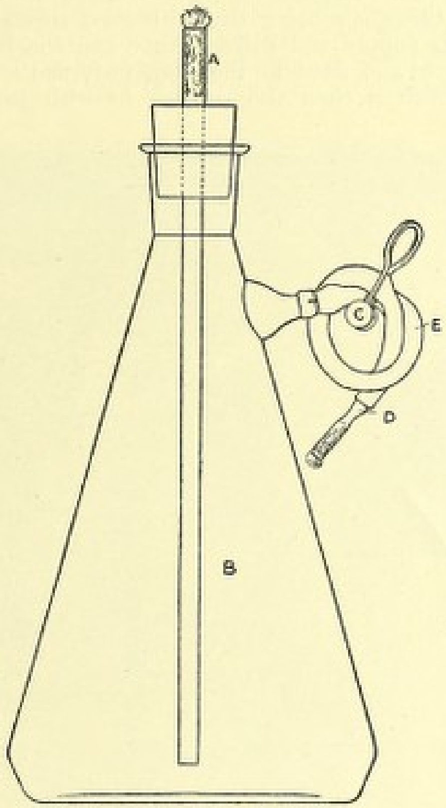


FIG. 8.

Fig. 11.—BURETTE FIRST USED FOR "FILLING IN" ANTITOXIC SERUM.

A—Orifice of burette in overflow bulb.
B—Thistle-head funnel, plugged with sterile cotton wool.
C—Overflow tube.
D—Graduated burette.
E—Two-way tap, turned so as to allow burette to be emptied by F, which is protected from falling dust by bell, G.
H—Inlet tube from stock flask.

Fig. 8.—FLASK PREPARED FOR RECEPTION OF ANTITOXIC SERUM.

A—Glass tubing, mouth of which is filled with sterile cotton wadding.
B—Tube inside flask.
C—Pinch clip.
D—Constricted glass tube, plugged with sterile cotton wadding, fitted into india-rubber tube E, wired on to lateral tube of filter flask.

The light grey deposit usually consists of granules, leucocytes and fragments of fibrine; the pinkish tinge in the deposit is due to the presence of a few blood corpuscles or of hæmoglobin-tinged fibrine; and the darker colour to the presence of a much larger proportion of red blood corpuscles. This deposit all collects below the lateral tube of the flask, and the clear supernatant serum may be drawn off without disturbing it in any way.

The serum is then decanted into flat-bottomed specimen tubes (Fig. 10, I), which are prepared in the following way:—

They are allowed to soak for 24 hours in cold water, especially if they have already contained serum. They are then thoroughly washed with boiling water and steamed in the steam steriliser, after which they are transferred to a large vessel containing a 2 per cent. solution of trikresol. At the same time india-rubber bungs, each with a single hole bored in the centre, are first thoroughly washed in cold water, and are then soaked in a 5 per cent. solution of carbolic acid, after which they are transferred to a 2 per cent. solution of trikresol. Short glass tubes, drawn out to a fine point, washed and sterilised in the same way as the specimen tubes, are then fitted into the holes in the bungs—the drawn-out portion being placed in the bung so that it shall be outside the tube when the bung is pushed home. The tubes are drained as thoroughly as possible, and the bungs with the tubes in position are fitted. The serum is filled into these tubes by means of one or other of the following Preparation of tubes for the reception of the antitoxic serum.

Continuous delivery burette.

pieces of apparatus. The first consists of a continuous-delivery burette (Fig. 11) which I have modified somewhat from those ordinarily in use; it is specially useful where small measured quantities of serum have to be decanted. It consists of a graduated burette (D) with a two-way stopcock (E) controlling two tubes, one (H) leading into the pipette, the other forming the delivery tube (F). To the upper part—which is drawn off to a fine opening (A), and cut to such a length that the burette holds a definite quantity—is fused a small glass chamber, usually in the form of a bulb. At the lowest part of this bulb is a glass tube (C), which serves to carry off the overflow from the burette, whilst from the upper portion is another tube leading to the thistle-head funnel (B). This second tube is placed a little to one side, so that when the serum rises rapidly from the constricted end of the burette it may not be driven up the tube, but, impinging on the wall of the globe, falls back and runs out by the overflow pipe. To prepare this apparatus for use the whole of this glass part is washed with cold water, then with hydrochloric acid, after which it is again thoroughly rinsed. The stopcock is then wrapped in cotton wadding and surrounded with clean tough paper, the whole being tied with good strong thread. Around the lower part of the burette, with its supply and delivery tube and the bore for the stopcock, cotton wadding and paper are wrapped and fixed in the same way, and a plug of cotton wadding is placed in the thistle-head, which is then also covered in with paper for the purpose of keeping off

Sterilisation of burette.

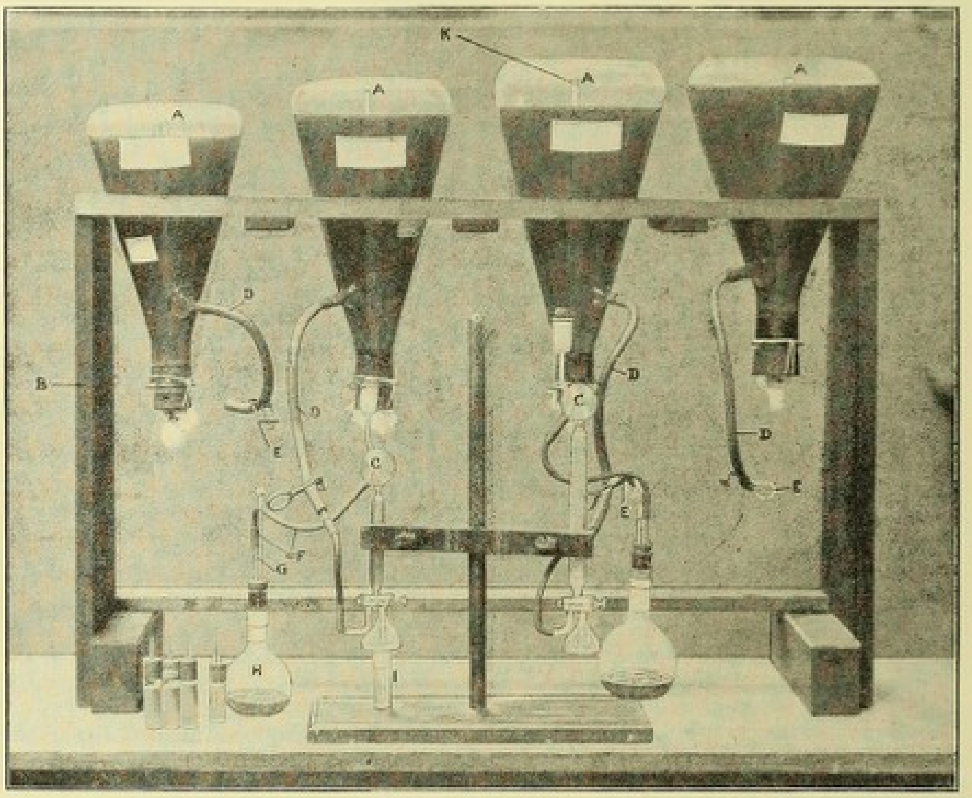


Fig. 10.

A—Inverted flasks containing antitoxic serum, on wooden stand, B.
C—Overflow bulb.
D—India-rubber tube leading from lateral limb of flask to filling way of measuring burette.
E—Pinch clip and screw clip to control outflow of serum.
F—India-rubber tube taking overflow from bulb to sterile flask, H, from which air escapes through sterile cotton wadding by tube, G.
I—Tubes into which antitoxic serum is decanted to be sent out to hospitals.

dust. The stopcock and burette are then heated in the hot air steriliser at a temperature of about 160° C.—this temperature being maintained for about three hours. The process of cooling off should be allowed to go on as slowly as possible, in order that the glass may not fly at the points of fusion. A small flask (Fig. 10, H), stoppered with an india-rubber bung through which two glass tubes (F and G) pass, each of them plugged with sterile cotton wadding, is sterilised by means of steam. When the apparatus is to be used, a piece of sterilised $\frac{1}{4}$-in. or $\frac{3}{16}$-in. india-rubber tubing is fixed to the supply tube of the burette (Fig. 11, H). The other end of this is filled with a plug of sterile cotton wadding, or is at once connected by a piece of glass tubing that has been thoroughly washed and sterilised with bi-chloride of mercury (1 per 1,000), or 5 per cent. carbolic acid solution, to the india-rubber tube (Fig. 10, D) leading from the flask containing the serum. Another piece of similar tubing is affixed to the overflow pipe (Fig. 11, C), and to one of the tubes (Fig. 10, F), from which the sterile wadding is withdrawn, leading to the small sterilised flask.

The wadding is now removed from the lower part of the burette, and also from the stopcock, which, after being smeared with a trace of clean sterile vaseline, is pushed home; the burette is held in position in a wooden burette clamp. These burettes are made in various sizes—10, 20, and 30 c.c.—and with one or other of them any quantity of serum from 1 c.c. to 30 c.c. may be measured.

The clip (Fig. 10, E) is removed from the india-rubber tubing (Fig. 10, D), and as soon as the tap is turned serum runs down to the supply tube and into the burette, rising to the top, from which it overflows into the bulb (C), and so down the waste tube (F) into the small flask (H), until the tap is turned. The air is driven through the sterile cotton wadding. If a half-turn is now given to the tap the flow is cut off. One of the tubes to contain the serum is then taken in the left hand, the bung is withdrawn with the right, and another half-turn is given to the stopcock: the serum is then delivered to the glass tube; the stopcock is reversed, the serum again flows into the burette, the bung is rapidly pushed home; and the process is repeated until the whole of the serum has been decanted. If from a 10-c.c. pipette a quantity of 5 c.c. is required in each tube, half a turn is given the stopcock when the level of the falling surface of the serum reaches the 5-c.c. mark; the second 5 c.c. is afterwards withdrawn into another tube; and so the process goes on. When larger quantities than 10 c.c. or smaller quantities than 5 c.c. are required, the 20 c.c. or the 30 c.c. burette may be used, according to the number that will divide best to give the requisite number. After the bungs have been well pushed home the drawn-out ends of the glass tubes are rapidly sealed off in the blow-pipe flame, so that if the bungs fit well the tubes are practically hermetically sealed. Use of burette.

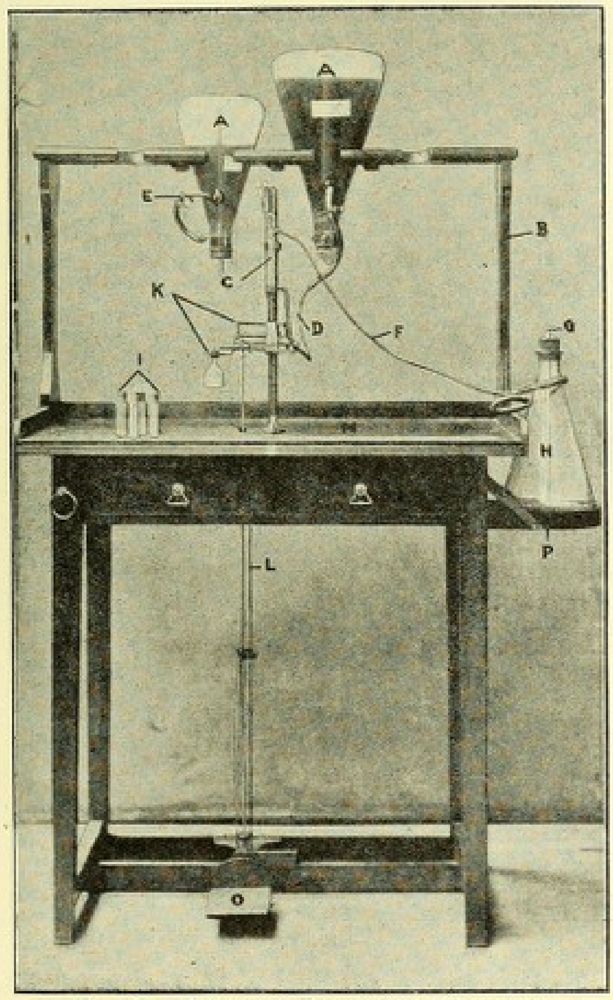


Fig. 12.—Improved Decanting Apparatus.

A—Flasks containing serum. B—Supporting frame. C—Burette. D—Supply pipe to burette. E—Pinch clip on supply pipe. F—Overflow or waste pipe, leading to flask, H, with tube, G, to which this waste pipe is attached. I—Tubes ready to receive serum. K—Delivery pipes, etc., from burette. L—Cord working alternating spring lever. M—Drawer in table N, which is covered with plate glass. O—Pedal to work cord and lever. P—Bracket, on which stands "waste" flask.

The burettes were in the first instance made without any bell (Fig. 11, G) to protect the delivery tube from falling dust; but such a bell, as drawn in the accompanying figure, should always be added. Latterly, especially when large quantities of "blended" serums have to be decanted, we have used a modification of the apparatus used in the Institut Pasteur (Fig. 12). This apparatus consists of a graduated tube (C) closed at the lower end by an india-rubber bung. Through this bung runs a small tube bent at right angles, the upright limb of which is movable in the bung and can be pushed to any required distance into the outer tube. Leading from the horizontal limb of this smaller tube is a piece of india-rubber tubing to which is attached a tube also bent at right angles, one end of the tube serving as a delivery jet (K). The upper (horizontal) limb passes into the india-rubber tubing, and the lower (vertical) limb is surrounded by a bell which prevents dust from falling on to the delivery limb. Fused at right angles into the lower part of the burette is a small tube which is connected by india-rubber tubing (D) with the serum flask or jar (A). The upper Improved decanting apparatus.

end of the burette ends in a bulb, &c., similar to that already described on the other piece of apparatus.

The india-rubber supply and delivery tubes are so arranged between fixed and movable blocks, the latter being placed one at each end of a kind of beam fixed on a pivot in the middle, that when one end of the beam is depressed the other is raised. When the end to the right is raised, the supply tube is opened and the delivery tube is closed; whilst when the left end of the beam is raised and the right is lowered, the supply tube is closed and the delivery tube is opened. By means of a string (L), attached above to the left of this beam and below to a pedal, the left end is depressed, and as soon as the weight of the foot is taken from the pedal a spring reverses the action. The hands are thus left perfectly free to uncork and cork the sample tubes, and the decanting is much more rapidly carried out (provided the supply and delivery tubes are large enough) than by means of any other apparatus that has been devised. The size of the dose is regulated by means of the delivery tube, which may be moved up and down to the level of any mark on the burette, the burette being graduated from above downwards. Where large quantities are to be decanted a large sterile flask (H) is required to take the overflow. Here again the serum never comes in contact with unfiltered air, except during the time that it is passing

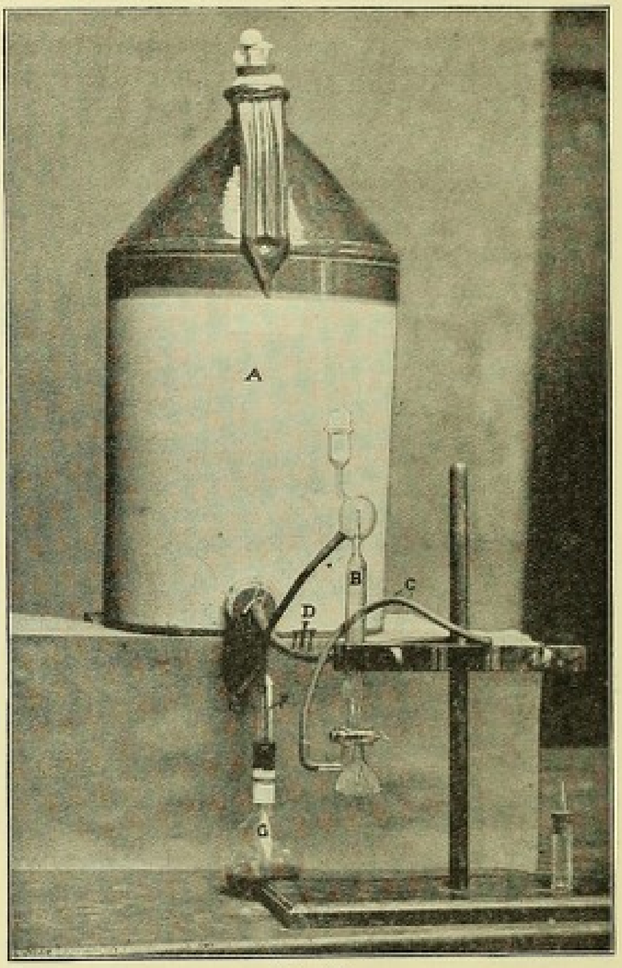


Fig. 13.

A—30-gallon stone jar, fitted with supply tube, C, leading from bottom to the burette, B.
D—Screw-clip to control flow of serum.
E—Overflow pipe.
F—Tube stoppered with cotton wool to allow of escape of air from flask, G, receiving overflow.

from the delivery jet to the tube, and the danger of any dust getting in is minimised by having the protecting glass bell. In some cases, as above indicated, where it has appeared to be desirable to mix the serums from several horses, or from a large number of bleedings, large

Large stock

30-gallon stoneware jars (Fig. 13, A) have been used in place of the glass filter flasks. An upper orifice is fitted with a bung, through which a short glass tube runs, the upper end of this tube being covered with a plug of sterile cotton wadding, held in position by an elastic band. A lower opening, made for the reception of a tap, is also closed with a bung, but in this case the glass tubing which passes through the bung is slightly bent, curving upwards so that the inner end of the tube is raised some little distance above the bottom of the jar. The outer portion of the tube may be turned a little downwards. The inner upward bend allows of the sedimentation of the serum to a point below its opening, so that only clear serum is withdrawn. To the outer end of this tube a piece of india-rubber tubing (C) with a strong screw clip (D) is attached, and sterile cotton wadding is kept in position over the end of the india-rubber tubing (until it is to be fitted up, as in the accompanying Figure, to one or other of the decanting burettes), by means of an india-rubber band.

The ends of the small glass tubes are then fused in the blow-pipe flame, the phials are marked with pink labels on which the number of the serum and the number of units in each bottle are stamped. They are then packed in boxes, each box containing 25 separate cardboard tubes, into which the bottles, each resting on a little bit of cotton wadding, fit. They are then marked with a label, of one of which the following is a copy. Those tubes that are obtained by Medical Officers of Health and others, through warrants forwarded to the Board, are labelled with yellow labels instead of pink. The following is a copy of one of these labels. A record of the serum sent to each Distribution of antitoxic serum

LABORATORIES
R.C.P. LOND. & R.C.S. ENG.

DIPHTHERIA ANTITOXIN FOR SPECIAL USE.

4,000 *Units in* 10 *c.c.*

No. 52.

hospital is kept, the number of the serum, its strength in units per c.c., the number of c.c.'s in each dose, and the number of bottles sent out on any given date. The bottles, bungs, and boxes are all returned from the hospitals to the laboratory, in order that they may again be used.

DIPHTHERIA ANTITOXIN.

Each bottle contains .... in units c.c.

Sent out .... *190* .... *to* ....

Please return this Box, with empty bottles and india-rubber corks, to

THE LABORATORIES,
ROYAL COLLEGE OF PHYSICIANS AND SURGEONS
EXAMINATION HALL,
VICTORIA EMBANKMENT,
No. **LONDON, W.C.**

The following is a copy of the instructions enclosed with each batch of serum sent to any one obtaining serum from the laboratories for the first time :—

ROYAL COLLEGE OF PHYSICIANS OF LONDON
AND
ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE LABORATORIES,
Examination Hall,
Victoria Embankment,
London, W.C

INSTRUCTIONS FOR THE USE OF
ANTITOXIC SERUM.

Use an injection-syringe that will hold 10 c.c.

This syringe should have an asbestos piston, or one that will stand the action of boiling water.

If the parts of the syringe have not been thoroughly sterilised with carbolic acid (1–40), boil them before using. This is readily done in a saucepan or a large test-tube.

Wash the skin of the flank with warm water and soap, and then with 1–40 carbolic acid if there is any to be obtained.

Use a sharp needle and inject slowly into the loose subcutaneous folds between the crest of the ilium and the last rib.

Inject from 3000 to 4000 units as early as possible in the disease. Give a double dose if the disease has gone beyond the third day.

Do not inject the serum into the arm or leg. Keep the skin around the puncture very clean.

Wash out the syringe with *clean cold* water and then place the parts in carbolic acid (1–40), or in boiling water and wash out with methylated spirit or absolute alcohol.

Details of Treatment of Horses Producing Antitoxin.

Horse No. 1, "Charger," Bay Gelding.—Chart No. 1 and Table CXI.

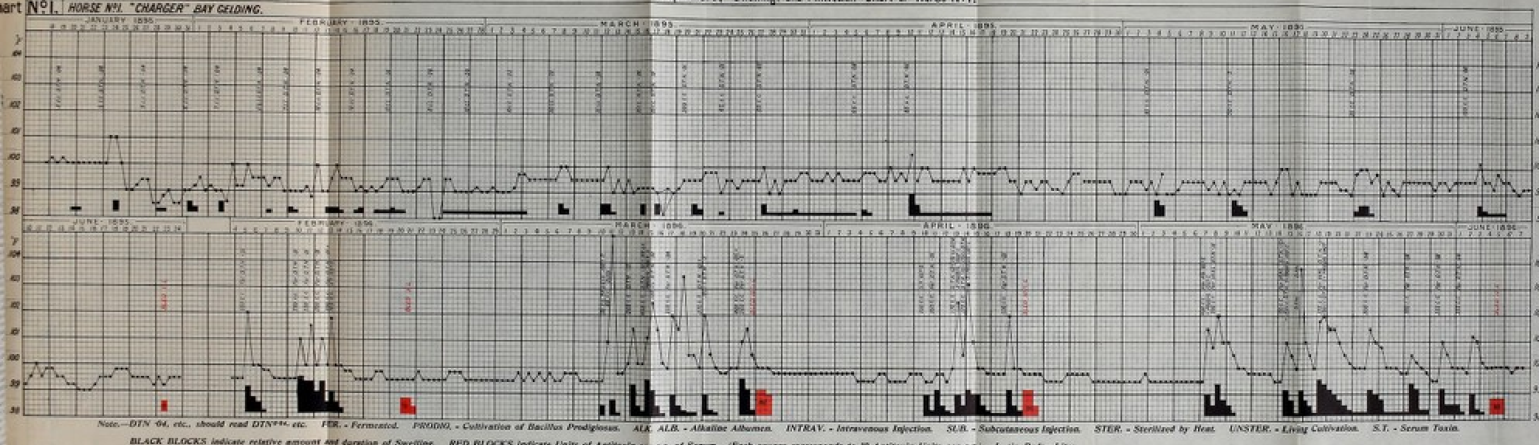
Preliminary experiments.

It will be seen, from a careful consideration of the injections marked on this chart—the insignificant local reactions and the slight temperature oscillations obtained—that this first animal was treated in a very cautious fashion, and in the first instance with perhaps even more caution than was necessary, taking into consideration the fact that Roux and Yersin's work had at that time been published. It was thought desirable, however, to run no unnecessary risk, and for us to feel our way carefully in applying a method of which we had comparatively little experience, especially in the case of large animals. It appears that during the first three months the local reactions obtained were very slight indeed, and that during the first five months the rise of temperature beyond 100° F. (37·7° C.) was obtained on five occasions only. The toxin that was used was so weak—usually D T $N^{0\cdot 02}$, and never higher than D T $N^{0\cdot 2}$—that it could have produced only slight effects even had it been injected in larger quantities; still, the normal line of the temperature was disturbed, and slight, and in some cases somewhat long-continued, local reactions were obtained by the injection of gradually increasing doses of toxin but slightly stronger than that originally used, given at intervals of three or four days. It will thus be seen, on following the chart and noting the number after each injection of toxin—this number referring to the strength of the toxin injected—that there was at first a steady, and later a more rapid, rise in the number of lethal doses, the lethal dose representing the quantity necessary to kill a 250-grammes guinea-pig on the fourth day. The first really marked reaction was obtained on the 10th of April. After this good reactions were noted on the 4th, 6th, and 24th of May and on the 4th of June. Up to this date it had been thought unnecessary to bleed the horse for anything more than samples of blood, but now half a litre of serum having an antitoxic value of 20 units per cubic centimetre was withdrawn; serum of this strength had been obtained only after five months from the commencement of treatment. The same intermittent treatment was continued throughout this year, and on October 10th the strength of the serum had risen to 40 units per c.c., and on the 7th of November to 50 units; the earlier of these samples were looked upon as corresponding approximately to the serum sent out by Roux as suitable for the treatment of diphtheria patients, and was the serum used until February, 1896, when, in consequence of the results obtained by Dr. Wood on smaller animals, this horse, along with several others, was treated with the object of determining whether it was possible by a cumulative method of treatment, and by the injection of large quantities of serum toxin, to induce a more rapid formation of antitoxin. On the 5th of February a well-marked reaction was obtained by injecting 550 c.c. of toxin (D T $N^{0\cdot 01}$), followed by a four days' reaction produced by injections of comparatively large quantities (1,500 c.c. in all) of this weak toxin, with the addition on the last occasion of 100 c.c. of Dr. Wood's serum toxin. There was a rapid and regular rise of temperature on these four days, and the swelling was never allowed to disappear. The last injection was made on the 13th, and the animal, bled on the 21st, yielded a serum having an antitoxic value of 75 units per c.c. In March, as will be seen from the chart, the action of the diphtheria toxin was assisted by the addition of a culture of *Bacillus prodigiosus*, and this mixture when injected gave rise to a very marked rise in temperature—a considerably greater rise in proportion than was obtained as regards the local reaction; but in subsequent injections, although very large quantities were given, the rise of temperature was not so marked, but the local swelling was considerably greater. On the 25th the serum contained 140 antitoxin units per c.c., the highest point reached in serum taken from this horse; for, although marked and continuous reactions were obtained both in April and in May by the use of *prodigiosus* culture along with the toxin, the antitoxic value of the serum had fallen on the 20th of April to 120 units per c.c., and on the 5th of June to 90 units. In August, as the result of a couple of sharp reactions, after the animal had been allowed to rest for a few weeks, the serum, on the 6th, contained 80 units. Following this, two sharp reactions were obtained on September 20th and 23rd, especially on the second occasion, the temperature rising to 103° F. (39·5° C.). On the 20th October the blood contained 90 units per c.c. Nothing further was done to this animal until February 19th, 20th (intravenous), 22nd, and 27th, when two injections, one of toxin and one of serum toxin D T $N^{0\cdot 05}$ (about 500 c.c. on each occasion), were given. With the first two injections the temperature rose to 104° F. (40° C.), and after the third to 103° F. (39·5° C.). These injections were followed up by subcutaneous injections of D T $N^{0\cdot 25}$ toxin, 200 c.c. on the 26th, and 450 c.c. on the 27th. As a result of this there was prolonged swelling, accompanied by a rise in temperature to 102·8° F. (39·4° C.). On the 23rd of March the serum was found to contain 125 units per c.c., but, as this was now considerably weaker than the other serum we were using, it was decided to discontinue the use of this horse, and after this date the serum was not again used. The figures in connection with the treatment of this horse are given somewhat more fully and over a longer period than in the case of most of the other animals, especially during the early period during which the animal was under treatment, as it may be taken as a fairly typical example of the results obtained by the older and more cautious method of treatment; and it was the result obtained in this and similar cases, as compared with those obtained by the more rapid methods, which first drew our attention to the fact that there appears to be an essential and fundamental difference between the methods to be adopted for producing artificial immunity in an animal, and those to be resorted to for the purposes of obtaining high antitoxic value of the serum. There can be no doubt that it is possible so to treat an animal, especially by prolonging the process of treatment over a considerable period, as to obtain a very great resistance to the action of diphtheria toxin, and large quantities may be injected without giving rise either to any increase of temperature, or to the production of marked swelling. In these cases the resulting amount of antitoxin in the blood is comparatively small. On the other hand, it was noticed that following the introduction of considerable quantities, no doubt of weak toxin, large quantities of antitoxin were formed,

Margin notes: First batch of antitoxic serum withdrawn. — Serum toxin treatment commenced. — *Bacillus Prodigiosus* treatment.

Temperature, Swelling, and Antitoxin Chart of Horse N°1.

Chart N°1. HORSE N°1. "CHARGER" BAY GELDING.



Note.—DTN ·04, etc., should read DTN·04, etc. FER. - Fermented. PRODIG. - Cultivation of Bacillus Prodigiosus. ALK. ALB. - Alkaline Albumen. INTRAV. - Intravenous Injection. SUB. - Subcutaneous Injection. STER. - Sterilized by Heat. UNSTER. - Living Cultivation. S.T. - Serum Toxin.

BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum. (Each square corresponds to 10 Antitoxin Units per c.c.) L. (in Red) - Litre.

TABLE CXI.—Horse No. 1, Charger, Bay Gelding, weighs 520 kilos. Blood—$\frac{1}{13}$ of body weight = 40 kilos (litres) = 20 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding	Amount of blood withdrawn — in litres. Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of A.T., accounted for from commencement of Treatment.	Serum, Toxin, etc.
1895											
Jan. 19th to June 3rd	4,971, say 5,000	50	June 23rd	1·0	20	400,000	400,000	400,000	1 to 8,000	1 to 8,000	
July 8th to 25th	4,000	90	Aug. 4th	2·4	30	600,000	200,000	436,000	1 to 5,000	1 to 4,844	
Aug. 13th to Sep. 15th	1,400	104	Sep. 20th	4·2	35	700,000	100,000	509,500	1 to 7,143	1 to 4,900	260 c.c. S.T.
Sept. 28th	1,500	119	Oct. 10th	3·2	40	800,000	100,000	573,500	1 to 6,666	1 to 4,819	100 c.c. S.T.
October 26th	3,000	149	Nov. 1st	5·2	40	800,000	—	677,500	—	1 to 4,547	
Nov. 4th to Dec. 3rd	14,250	291	Dec. 7th	6·8	50	1,000,000	200,000	847,500	1 to 1,408	1 to 2,912	
1896											
Jan. 11th	7,500	366	Jan. 25th	10·8	40	800,000	Fall	1,062,500	Fall	1 to 2,905	
Feb. 5th to 13th	1,950	386	Feb. 21st	9·0	75	1,500,000	700,000	1,401,000	1 to 35,000 ! !	1 to 3,629	100 c.c. S.T.
March 10th to 23rd	17,625	562	March 25th	10·5	140	2,800,000	1,300,000	2,136,000	1 to 7,386	1 to 3,800	150 c.c., prodigiosus, heated to 100° C.
April 10th to 18th	13,100	693	April 20th	10·5	120	2,400,000	Fall	2,766,000	Fall	1 to 3,991	250 c.c. S.T. + 150 c.c., prodig.
May 7th to June 2nd	27,250	965	June 5th	12·0	90	1,800,000	Fall	3,306,000	Fall	1 to 3,425	400 c.c. A.A.T. + 200 c.c., prodig.
July 29th to Aug. 3rd	2,800	993	Aug. 6th	9·6	80	1,600,000	Fall	3,690,000	Fall	1 to 3,716	
Sep. 19th to 22nd	4,850	1042	Oct. 20th	11·2	90	1,800,000	200,000	4,184,000	1 to 4,081	1 to 4,015	
1897											
Feb. 20th to 27th	31,750	1359·5	March 23rd	9·0	125	2,500,000	700,000	4,746,000	1 to 2,204	1 to 3,490	500 c.c. S.T.

No account is taken of loss of A.T. by excretion and tissue destruction, neutralisation by Toxin, etc.

In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.

Immunity and antitoxin-forming power not the same.

especially when the rise of temperature was marked and the local reaction was very distinct; indeed, the production of antitoxin appears to rise so long as it is possible to obtain local and continuous reactions, as manifested by the swellings and the rise of temperature. As soon as it is no longer possible to obtain these reactions the immunity of the animal may remain or be actually increased, but the power of forming antitoxin is gradually lost; and it would appear that as we have the functions necessary for the production of an active immunity developed, those necessary for the production of antitoxin are allowed to fall into disuse, perhaps because they are no longer required. It would appear, indeed, that as the cells of the tissues become so far fundamentally changed that they can carry on the work in the presence of toxins, the separate antitoxins which neutralise the antitoxin outside the cell, no longer being required, are not formed. We shall have to refer to this in connection with the treatment of several of the other horses.

Horse No. 2, "Brown Pony," Gelding.—Chart No. 2 and Table CXII.

The treatment of this animal was commenced on the 24th of January, 1895, and until January, 1896, was treated on much the same lines as Horse No. 1 (see Chart No. 1); the highest antitoxic value that was reached during this period being on the 14th of October, when the serum contained 45 units per c.c. On the 22nd of January, 1896, after it had been found on the 11th that the temperature was scarcely raised by an injection of 400 c.c. of D T $N^{0\cdot02}$, and finding that the serum on the 14th had an antitoxic value of 40 antitoxin units per c.c., a more

More vigorous treatment adopted.

vigorous method of treatment was commenced on the 22nd, and by means of mixtures of the serum toxin and the ordinary toxins (D T $N^{0\cdot02}$ and D T $N^{0\cdot04}$), previously used—five injections in fifteen days—Dr. Wood obtained well-marked temperature and local reactions (see chart). The last of these injections was given on the 5th of February, and the animal was bled on the 14th, and then again on the 21st of that month, and on both occasions it was found that there had been a marked rise in the antitoxic value of the serum, each serum now containing 150 units per c.c. On the 10th of March treatment was again commenced, and in order to obtain a condition of "instability," which it was argued had much to do with the production of antitoxin, two doses of sterilised *prodigiosus* were injected. Here, as in the case of Horse No. 1, the rise of temperature after the first injection was very marked, reaching 104·8° F. (40·4° C.) on the evening after the second injection. Here again, as in the case of Horse No. 1, the swelling was not especially marked, but after the injection of 200 c.c. of serum toxin, followed by 200 c.c. on the 14th, 200 c.c. D T N $^{0\cdot02}$ on the 15th, and on the 16th 350 c.c. of serum toxin, reactions of 102°, 101°, and 102·5° F. (39°, 38·3°, and 39·2° C.) were obtained, accompanied by a well-marked swelling, which lasted from the 12th to the 19th,—and again by four injections on the 25th, 27th, 30th of March, and 1st of April, these being followed by a rise of temperature to 103° F. (39·5° C.) on the 27th of March,—and again on the 1st of April, the swelling being almost continuous, although, of course, it was more marked after each injection. The result of this continuous treatment was that the serum obtained from

Highly potent antitoxic serum obtained.

blood drawn on the 3rd of April contained 400 antitoxin units per c.c., the strongest serum that up to that time we had obtained; and allowing that the antitoxic value of the blood had not fallen between the 21st of February and the 10th of March, there had been a rise of 250 units per c.c. in twenty-five days. It will be seen from the chart that by the injection of diphtheria toxin and cultures of *B. prodigiosus*, accompanied, or followed, by occasional injections of serum toxin, this high antitoxic value was maintained during April; but that during May, when the treatment appears to have been almost identical, and the local reactions were the same, if not more marked, though the temperature reactions were never quite so high, the value of the serum had fallen to 350 units per c.c. In the above statement one important reservation must be made as regards the identical treatment, and that is, that a couple of doses of alkali albumen toxin were substituted for the serum toxin, of which none was injected during this period. In June and the early part of July, treatment was discontinued; but on the 18th, 19th, and 20th of July three large doses of toxin (D T $N^{0\cdot1}$) were given, and when the animal was bled on the 25th the serum again had a value of 400 units per c.c. In August the same results were obtained; but in September, although good reactions were obtained by a couple of injections of toxin (D T $N^{0\cdot1}$) on the 18th and 21st, the animal was not bled until the 22nd of October, and it was then found, probably owing to the long period that had elapsed since the last injection, that the serum had now a value of only 270 units per c.c., and it fell on successive bleedings to 250 units and then to 225 units per c.c. In February, 1897, an attempt

Intravenous injection resorted to.

was made to increase the value of the serum by injecting diphtheria toxin (D T $N^{0\cdot25}$) intravenously. Here, as might be expected, good temperature reaction was obtained, but there was practically no local reaction of any kind. Five of these intravenous injections, followed by one subcutaneous injection at an interval of four days, produced entirely unexpected results, as, when six days later the animal was bled, it was found that the serum, instead of having a higher value, had fallen from 225 units per c.c. on February 9th to 125 units on March the 4th. It should be carefully noted that there had been little local swelling during this period. From the 6th to the 12th of March three intravenous injections of toxin (D T $N^{0\cdot1}$ and D T $N^{0\cdot25}$) and serum toxin, and four subcutaneous injections of the same toxin, gave rise to a marked increase of temperature, this being accompanied by much more marked and continuous swelling than that recorded as the result of the previous injections, and it was found that blood taken on the 20th of March had again run up in antitoxic value, the serum now

Aim of treatment.

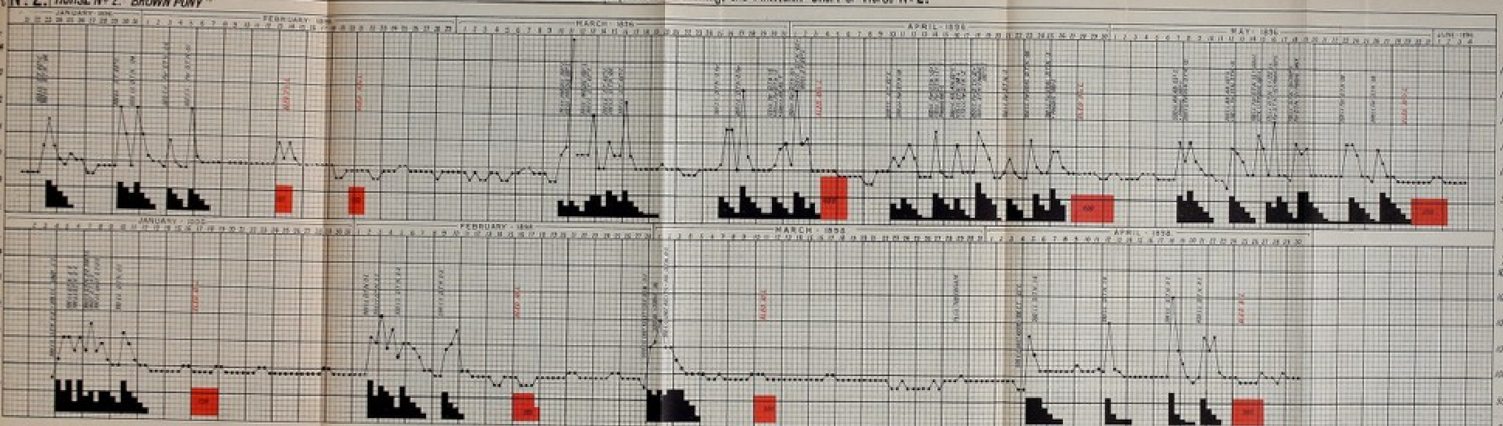
containing 250 units per c.c. In the subsequent treatment during 1897 it was our aim to keep up continuous swelling for four or five days, and to keep an oscillating temperature, as it had been found that wherever we were successful in doing this we obtained an increase in the antitoxic value of the serum, but that wherever we failed in this, owing to an insufficient supply of toxin or serum toxin, or to accidents to any of the injection apparatus, or to the occurrence of slight attacks of laminitis, from

Fall in antitoxic value.

which this animal suffered from time to time, there was a fall in the antitoxic value of the serum. These statistics are, however, given in tabular form on page 127, and need not here be gone into. In

Chart N° 2. HORSE N° 2. "BROWN PONY"

Temperature, Swelling, and Antitoxin Chart of Horse N° 2.



Note.—DTN ·04, etc., should read $DTN^{\cdot 04}$, etc. FER. = Fermented. PRODIG. = Cultivation of Bacillus Prodigiosus. ALK. ALB. = Alkaline Albumen. INTRAV. = Intravenous Injection. SUB. = Subcutaneous Injection. STER. = Sterilized by Heat. UNSTER. = Living Cultivation. S.T. = Serum Toxin.

BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum. (Each square corresponds to 10 Antitoxin Units per c.c.) L. (in Red) = Litre.

TABLE CXII.—Horse No. 2, Brown Pony, weighs about 381 kilos. Blood—$\frac{1}{13}$ of body weight = 29·3 kilos (litres) = 14·65 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres). Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1895			1895								
Jan. 24th to Sept. 20th	6,768	67·5	Sept. 26th	3·2	30	439,500	——	439,500	1 to 6,511	1 to 6,511	150 c.c. S.T.
Oct. 5th to 12th	1,500	82·5	Oct. 14th	1·0	45	659,250	219,750	462,000	1 to 14,650	1 to 5,600	
Oct. 26th	1,800	100·5	Nov. 1st	3·2	40	586,000	Fall	526,000	Fall	1 to 5,233	
Nov. 4th to Dec. 3rd	12,750	228	Dec. 7th	8·0	50	732,500	146,500	726,000	1 to 8,138	1 to 7,223	
1896			1896								
Jan. 11th	6,000	288	Jan. 15th	8·8	40	586,000	Fall	902,000	Fall	1 to 3,135	
Jan. 23rd to Feb. 5th	4,900	337	Feb. 14th	7·5	150	2,197,500	1,611,500	1,464,500	1 to 34,938 !!	1 to 4,345	660 c.c. S.T.
——	——	——	Feb. 21st	6·25	150	2,197,500	——	1,933,250	——	1 to 5,736	
March 10th to April 1st	9,025	427·25	April 3rd	10·5	400	5,860,000	3,662,500	4,033,250	1 to 40,581 !!	1 to 9,440	850 c.c. S.T. + 200 c.c. A.A.T. + 150 c.c. prodigiosus.
April 10th to 25th	57,950	1006·75	April 28th	11·25	400	5,860,000	——	6,283,250	——	1 to 6,241	Fermented Toxin. 350 c.c. S.T. + 300 c.c. A.A.T. + 150 c.c. prodigiosus.
May 7th to 26th	18,425	1191	May 29th	10·5	350	5,127,500	Fall	8,120,750	Fall	1 to 6,818	Fermented Toxin. 700 c.c. A.A.T. + 400 c.c. prodig., which includes 50 c.c. unsterilised.
July 18th to 20th	10,125	1292	July 25th	9·6	400	5,860,000	732,500	10,040,750	1 to 7,252	1 to 7,771	Fermented Toxin.
Aug. 11th to 15th	8,400	1376	Aug. 18th	10·4	400	5,860,000	——	12,120,750	——	1 to 8,808	
Sept. 18th to 21st	8,500	1461	Oct. 22nd	9·6	270	3,955,500	Fall	13,416,750	Fall	1 to 9,183	
Nov. 24th	6,000	1521	Dec. 12th	9·6	250	3,662,500	Fall	14,616,750	Fall	1 to 9,610	
1897			1897								
Dec. 24th (1896) to Jan. 5th	13,750	1659	Jan. 9th	9·6	250	3,662,500	——	15,816,750	——	1 to 9,533	All intravenous injection.
Jan. 23rd	7,500	1734	Feb. 9th	9·6	225	3,296,250	Fall	16,896,750	Fall	1 to 9,744	
Feb. 16th to 26th	30,700	2041	March 4th	8·0	125	1,831,250	Fall	17,396,750	Fall	1 to 8,523	All but 300 c.c. intravenous.
March 6th to 12th	33,900	2380	March 20th	8·0	250	3,662,500	1,831,250	18,396,750	1 to 5,401	1 to 7,725	750 c.c. S.T., half intravenous.
March 30th to April 8th	3,100	2411	April 14th	9·6	150	2,197,500	Fall	19,116,750	Fall	1 to 7,929	1000 c.c. S.T., mostly intrav.
April 26th to 29th	10,500	2516	May 6th	8·0	120	1,758,000	Fall	19,596,750	Fall	1 to 7,788	700 c.c. S.T., half intravenous.
June 16th to 19th	23,200	2748	June 23rd	9·6	125	1,831,250	73,250	20,196,750	1 to 311	1 to 7,364	400 c.c. S.T. intravenous.
July 10th to 12th	10,400	2852	July 9th	4·8	250	3,662,500	1,831,250	20,796,750	1 to 1,762	1 to 7,291	220 c.c. S.T.
	——	——	July 24th	6·4	250	3,662,500	——	21,596,750	——	1 to 7,572	
Aug. 9th and 10th	10,400	2956	Aug. 19th	9·6	145	2,124,250	Fall	22,292,750	Fall	1 to 7,541	
Aug. 31st to Sept. 4th	53,000	3486	Sept. 13th	9·6	180	2,637,000	512,750	23,156,750	1 to 967	1 to 6,642	
Sept. 21st to 27th	16,000	3646	Oct. 5th	8·8	125	1,831,250	Fall	23,706,750	Fall	1 to 6,502	Fermented Toxin. 100 c.c. S.T.
Oct. 11th to 15th	29,000	3936	Oct. 25th	9·6	200	2,930,000	1,098,750	24,656,750	1 to 3,440	1 to 6,264	1175 c.c. S.T. unsterilised.
Nov. 9th to 14th	36,000	4296	Nov. 24th	9·6	275	4,028,750	1,098,750	25,986,750	1 to 3,052	1 to 6,049	1000 c.c. S.T. unsterilised.
Dec. 1st to 9th	51,000	4806	Dec. 20th	9·6	250	3,662,500	Fall	27,186,750	Fall	1 to 5,657	680 c.c. S.T. unsterilised.
1898			1898								
Jan. 4th to 10th	64,000	5446	Jan. 17th	10·0	250	3,662,500	——	28,436,750	——	1 to 5,221	600 c.c. S.T. unsterilised.
Feb. 2nd to 9th	35,000	5796	Feb. 16th	10·0	225	3,296,250	Fall	29,561,750	Fall	1 to 5,100	
Feb. 28th to March 2nd	31,500	6111	March 11th	10·0	200	2,930,000	Fall	29,661,750	Fall	1 to 4,853	1150 c.c. unster. ascit. T. $1\frac{1}{2}$ c.c. Tuberculin on Mar. 29.
April 4th to 21st	80,000	6911	April 25th	9·0	300	4,395,000	1,465,000	31,011,750	1 to 1,831	1 to 4,487	200 c.c. S.T. + 500 c.c. unster. ascit. T.

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc. In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.
A.A.T. = Alk. Alb., or Alkali Albumen Toxin, in this and in other tables.

January, 1898, after there had been a considerable fall in the strength of the serum, an effort was made to again increase its value by means of a cumulative treatment, which had been so successful in 1896. The result of this may be seen in the second part of the chart, but it will be noted that the potency of the serum had risen only some 50 units per c.c. in three months—from 250 on the 17th of January to 300 on the 25th of April. It will be observed, therefore, that the best result was obtained wherever the rise of swelling and temperature had corresponded, the oscillation of the temperature apparently having more to do with the increased antitoxic value than the actual increase on any single occasion. This last statement, however, is not fully borne out by the curves during April.

Horse No. 3, "Bay Mare."—Chart No. 3 and Table CXIII.

Slow rise in antitoxic value.

In both of the horses already described the results obtained during the first year of treatment were looked upon as being eminently satisfactory, and it was only when we came to put the "serum toxin" method into wider operation that, by comparison, the earlier results became insignificant. The next animal (Chart 3—Bay mare) had also reached what might be termed the useable strength of antitoxin during this first year; but it was not until the 10th of October, after the injection of toxin (D T $N^{0\cdot15}$) and serum toxin, that the value of the serum had risen to 40 units per c.c. on October 22, at which figure it remained on the 9th of November. On the 23rd of November 300 c.c. toxin (D T $N^{0\cdot15}$) was injected, and on the 3rd of December 400 c.c. of the same toxin, but still there was no rise in strength; and again, on the 15th of January, 1896, it had fallen to 25 units per c.c., although over one litre of toxin had been introduced at three injections since the last bleeding. From the 5th to the 12th February five injections, varying in amount from 200 to 600 c.c. of D T $N^{0\cdot01}$, were given (1,750 c.c. in all being given). It must

More rapid rise after use of *B. Prodigiosus* and serum toxin.

be borne in mind that this toxin was very weak; still, good reactions were obtained, and on the 14th the value of the serum had risen to 35 units per c.c. During March (from the 10th, and on to the 1st April) eleven injections—eight of toxin (mostly weak from D T $N^{0\cdot01}$ to D T $N^{0\cdot2}$, on four occasions with sterilised *prodigiosus*) and four of serum toxin, "the injections being sometimes mixed, *prodigiosus* being given with toxin and serum toxin." On the 3rd April the antitoxic value of this serum had risen to 100 units per c.c. It should be noticed on this chart how the temperature oscillated with the first sudden rise to 103·2, and how well marked was the local reaction. It should also be noticed that the blood was taken within 36 hours of the last injection. From the 10th of April to the 25th seven injections were given, still larger quantities (D T $N^{0\cdot04}$ to D T $N^{0\cdot3}$) being used than in the previous series of injections. *Prodigiosus* was given twice, and serum toxin once; the temperature, however, never rose to more than 101·7° F. (38·6° C.), and the local reaction was neither so marked nor so continuous as in a previous series of injections. The strength of the antitoxin was now found to have fallen on 28th of April to 60 units per c.c. A further attempt was made to raise the value of the serum, and from the 7th of May to the 2nd of June ten injections (D T $N^{0\cdot04}$ to D T $N^{0\cdot15}$) were given, *prodigiosus* products being used on four occasions. Alkali albumen toxin was injected twice, and well-marked, though intermittent, local reactions were obtained, the temperature being kept oscillating during a great part of the period. On June 5th the animal was bled, but the serum was found to contain only 50 units per c.c. In August it had fallen still further—to 30 units per c.c.—and it was decided to discontinue treatment of this animal, which we were, therefore, compelled to look upon as one of our failures. The

Mare kept to be driven in dog-cart.

animal, however, was in beautiful condition, and was afterwards driven in the dog-cart in which toxins were taken to the stable and antitoxins brought to the laboratories. It is very remarkable that we should have failed so utterly with this animal, but it ultimately became evident that it was simply a waste of time and material to attempt to raise the antitoxic strength of the serum when once it had commenced to fall from the not very high point that it reached in 1896.

Horse No. 4, "Chestnut Cob."—Table CXIV.

This horse came under treatment on 29th April and was injected until 10th October, 1895, during which time it received quantities of toxin varying from 1 c.c. to 75 c.c. (D T $N^{0\cdot02}$ to D T $N^{0\cdot2}$) in 18 injections.

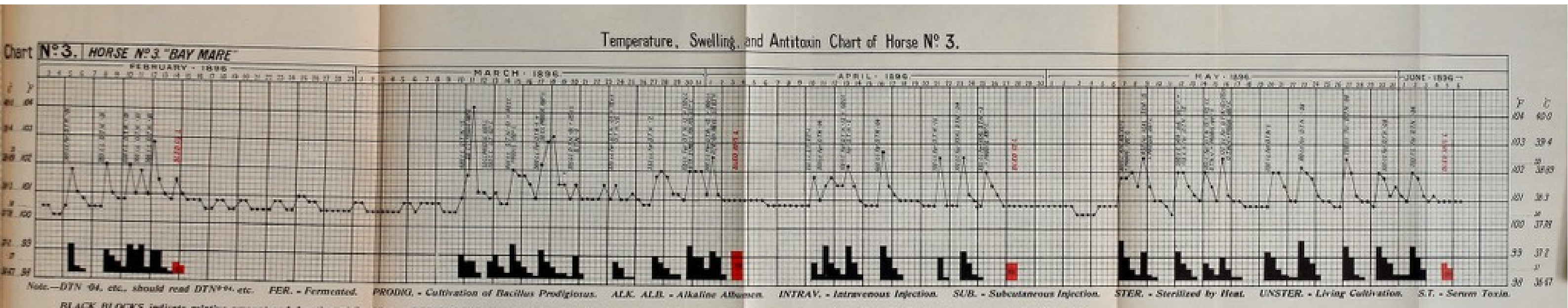
Continuous treatment commenced.

During August and September 25 c.c. of serum toxin was added to each five of the injections. On the 22nd October the animal was bled, and the serum was found to contain 40 antitoxin units per c.c. The same treatment, eight injections, was continued up to 11th January, 1896. On the 9th November the antitoxic value of the serum was 40 units per c.c., on 6th December 45 units, and on 15th January 45 units. At the end of January the continuous treatment already mentioned in the case of the other horses was resorted to, and between the commencement of this on 29th January and 14th February a rise in the antitoxic strength to 75 units per c.c. took place. The serum remained at this strength on 21st February. From the 9th to the 23rd March large quantities of tuberculin were given in conjunction with D T $N^{0\cdot01}$ to D T $N^{0\cdot2}$, a single intravenous injection of D T $N^{0\cdot01}$ being given on the 20th.

In this way the temperature was raised very considerably, on one occasion to 103·5° F., and marked and continuous swelling was obtained. On the 25th the serum had a value of 110 units per c.c. From the 10th to the 18th April six injections were made; to three of these sterilised *prodigiosus* cultures were added, and in one serum toxin was given, the quantity of toxin injected varying from 300 c.c. D T $N^{0\cdot175}$ to 700 c.c. D T $N^{0\cdot12}$. The swelling and temperature were maintained at a medium height during the whole of this period. On 20th April the serum had an antitoxic value of 150 units per c.c.

During May the treatment was exceedingly vigorous; the temperature and swelling were maintained almost continuously at a considerable height, an injection being given as soon as the

Temperature, Swelling, and Antitoxin Chart of Horse Nº 3.



Note.—DTN ·94, etc., should read DTN$^{0.94}$, etc. FER. = Fermented. PRODIG. = Cultivation of Bacillus Prodigiosus. ALK. ALB. = Alkaline Albumen. INTRAV. = Intravenous Injection. SUB. = Subcutaneous Injection. STER. = Sterilized by Heat. UNSTER. = Living Cultivation. S.T. = Serum Toxin.

BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum. (Each square corresponds to 10 Antitoxin Units per c.c.) L. (in Red) = Litre.

Table CXIII.—Horse No. 3, Bay Mare, Weighs 446·8 kilos. Blood—$\frac{1}{13}$ of body weight = 34·36 kilos (litres) = 17·18 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres) Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1895			1895								
Jan. 26th to July 25th	9,612	96	Aug. 4th	3·2	10	171,800	171,800	171,800	1 to 1,790	1 to 1,790	
Aug. 16th to Sept. 23rd	2,700	123	Sept. 30th	5·6	20	343,600	171,800	227,800	1 to 6,362	1 to 1,852	280 c.c. S.T.
Oct. 10th	1,500	138	Oct. 22nd	4·8	40	687,200	343,600	323,800	1 to 22,906 ! !	1 to 2,346	
Oct. 26th to Nov. 4th	6,750	205	Nov. 9th	4·8	40	687,200	——	419,800	——	1 to 2,047	
Nov. 4th to Dec. 3rd	10,500	310	Dec. 7th	5·6	30	515,400	Fall	503,800	Fall	1 to 1,625	
1896			1896								
Dec. 16th to Jan. 11th	6,800	378	Jan. 15th	7·2	25	429,500	Fall	593,800	Fall	1 to 1,570	300 c.c. S.T.
Feb. 5th to 12th	1,750	396	Feb. 14th	1·5	35	601,300	171,800	620,050	1 to 9,544	1 to 1,565	
March 10th to April 1st	31,985	715	April 3rd	10·5	100	1,718,000	1,116,700	1,145,050	1 to 3,500	1 to 1,601	Fermented Toxin period. 350 c.c. S.T. + 100 c.c. A.A.T. + 190 c.c. prodig.
April 10th to 25th	32,850	1,043	April 28th	12	60	1,030,800	Fall	1,505,050	Fall	1 to 1,443	Fermented Toxin period. 250 c.c. S.T. + 50 c.c. prodig.
May 7th to June 2nd	25,350	1,297	June 5th	10·5	50	859,000	Fall	1,767,550	Fall	1 to 1,362	Fermented Toxin period. 1,000 c.c. A.A.T. + 200 c.c. prodig.
July 29th to Aug. 3rd	4,000	1,337	Aug. 6th	11·2	40	687,200	Fall	1,991,550	Fall	1 to 1,489	

Table CXIV.—Horse No. 4, Chestnut Cob, weighs 377 kilos. Blood—$\frac{1}{13}$ of body weight = 29 kilos (litres) = 14·5 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres) Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1895			1895								
April 29th to Oct. 10th	5,119	51	Oct. 22nd	3·6	40	580,000	580,000	580,000	1 to 11,372	1 to 11,372	1 c.c. Mallein on 24th April, 205 c.c. S.T.
Oct. 26th to Nov. 4th	3,225	83	Nov. 9th	5·2	40	580,000	——	684,000	——	1 to 8,241	
Nov. 23rd to Dec. 3rd	7,500	158	Dec. 7th	8·0	45	652,500	72,500	864,000	1 to 2,966	1 to 5,468	
			1896								
Dec. 16th to Jan. 11th	8,200	240	Jan. 15th	3·6	45	652,500	——	945,000	——	1 to 3,937	450 c.c. S.T.
1896											
Jan. 22nd to Feb. 13th	3,950	280	Feb. 14th	9·6	75	1,087,500	435,000	1,305,000	1 to 10,875	1 to 4,660	1050 c.c. S.T.
Feb. 15th	500	285	Feb. 21st	9·6	75	1,087,500	——	1,665,000	——	1 to 5,842	200 c.c. S.T.
March 9th to 23rd	17,950	465	March 25th	11·2	110	1,595,000	507,500	2,281,000	1 to 2,819	1 to 4,905	29 c.c. tuberculin. Fermented Toxin period.
April 10th to 18th	20,100	666	April 20th	11·2	170	2,465,000	870,000	3,233,000	1 to 4,328	1 to 4,854	Fermented Toxin period. 250 c.c. S.T. + 250 c.c. A.A.T. + 150 c.c. prodig.
May 7th to 30th	25,250	918	June 3rd	9·6	160	2,320,000	Fall	4,001,000	Fall	1 to 4,358	Fermented Toxin period. 1100 c.c. A.A.T. + 200 c.c. prodig.
July 20th to Aug. 3rd	4,000	958	Aug. 6th	9·6	75	1,087,500	Fall	4,361,000	Fall	1 to 4,552	Fermented impure Toxin.
Sept. 19th to 24th	6,450	1,023	Oct. 22nd	9·6	40	580,000	Fall	4,553,000	Fall	1 to 4,450	

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc. In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.

temperature went down and the swelling had passed off, sufficient in each case to cause a sudden rise above 101° and a marked swelling. From the 7th to the 30th 11 of these injections were made with D T $N^{0\cdot04}$ to D T $N^{0\cdot15}$, and to four out of the first five a quantity of the sterilised *prodigiosus* culture was added.

On the 3rd June the serum of the blood withdrawn still contained only 160 units per c.c. Unfortunately, the treatment was stopped for a period of nearly two months; and although three good reactions had been obtained between 29th July and 3rd August, the blood withdrawn on the 6th was found to contain only 75 units; and on October the 22nd, three reactions only having been obtained on the 19th, 22nd, and 24th September, the value of the serum had fallen to 40 units per c.c. The serum from this horse was therefore no longer used for the treatment of patients in the hospitals under the Board.

Horse No. 5, "Dun Cob" Mare.—Chart No. 4 and Table CXV.

In the case of this animal the injections of weak toxin were made at considerable intervals —six during three and a half months—only such toxin as could be spared from the other animals being used. It was thought that perhaps a more permanent resistance to the action of the toxin might thus be obtained. On the 23rd May 1 c.c. D T $N^{0\cdot08}$ was injected: there was a slight rise of temperature (less than a degree), and a swelling the size of the palm of the hand. On the 7th of August 20 c.c. D T $N^{0\cdot12}$ gave rise to very slight swelling. On the 17th August Dr. Wood's

Serum toxin treatment begun.

serum toxin was first used along with ordinary broth toxin (D T $N^{0\cdot02}$ and D T $N^{0\cdot15}$), three injections of the mixture being given during the month and six during the next three weeks (D T $N^{0\cdot15}$); the last four of these being simply weak diphtheria toxin, but given in considerably larger doses. The last of these mixtures consisted of 25 c.c. of serum toxin and 15 c.c. D T $N^{0\cdot15}$, and the last dose of toxin alone, on the 10th of October, consisted of 75 c.c. D T $N^{0\cdot15}$. Following these injections the temperature and local reactions were much more marked; twelve days later—October the 22nd—the animal was bled, and the serum was found to contain 50 antitoxin units per c.c. On the 31st October and 4th November comparatively large doses of D T $N^{0\cdot15}$—100 c.c. and 125 c.c. respectively —were injected, but the reactions were not very marked in either instance. Five days later—November 9th—the serum had an antitoxic value of 50 units per c.c. During the next month (23rd November and 3rd December) two injections of 300 c.c. each D T $N^{0\cdot15}$, both followed by fairly good reactions, were given, and on 7th December the serum had a strength of 60 units per c.c. The horse was then allowed to rest until the 11th of January, when 300 c.c. D T $N^{0\cdot15}$ was injected. This was followed by good local reaction, though there was little rise of temperature. Nevertheless, the serum taken on the 15th contained 90 antitoxin units per c.c. From the 22nd January to the 15th February (see Chart No. 4) 1,150 c.c. of serum toxin and 3,715 c.c. of weak toxin (D T $N^{0\cdot01}$ to D T $N^{0\cdot01}$) were injected in ten injections, and from the 8th to the 18th the swelling was never allowed to disappear, a fresh injection being given before the effects of the previous one had passed off. During this time the temperature never rose to 101° F. (38·3° C.), and the swelling was only twice more than 18″ × 18″ × 2″. The blood drawn on the 21st of

Cumulative action of stimulants.

February, however, had an antitoxic value of 250 units per c.c. As a result of these experiments, after giving the horse a rest for seventeen days, Dr. Wood, in order to obtain a cumulative action and to increase the general and local reactions by applying another stimulating substance along with the specific diphtheria toxin, injected mallein—2 c.c. on the 10th March, 2 c.c. on the 11th, and 4 c.c. on the 12th: there was little local reaction; but on the 13th, after the injection of 300 c.c. D T $N^{0\cdot15}$, local reaction was marked. Before this had disappeared, on March 14th, 500 c.c. D T $N^{0\cdot15}$ along with 5 c.c. mallein was injected on one side, and 300 c.c. D T $N^{0\cdot15}$ on the other; this caused the temperature to rise to 102° F. (39° C.); there was also extensive local reaction; this local reaction was maintained for four days by two further injections, one without and one with 2 c.c. mallein. 400 c.c. D T $N^{0\cdot01}$ was injected intravenously on the 20th March, when the temperature again ran up to nearly 102° F. (39° C.); then 400 c.c. D T $N^{0\cdot09}$ was injected subcutaneously, on 23rd

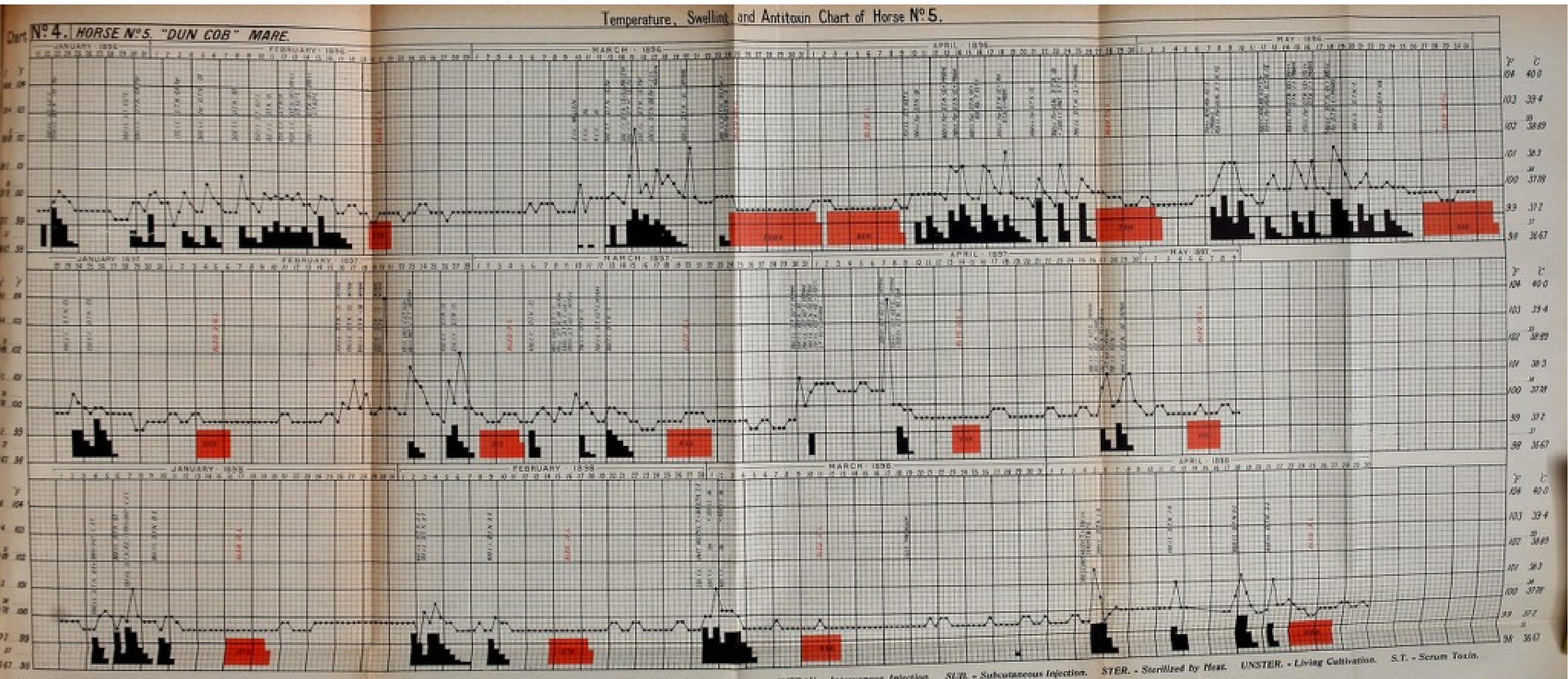
Extraordinary rise of potency of serum.

March: this was followed by slight reaction. On testing the antitoxic value of the blood drawn on the 25th March, a most extraordinary rise was found to have taken place, each c.c. of serum now containing 1,000 antitoxin units. On the 6th of April the animal was again bled; the antitoxic value of the serum now, however, was only 800 units per c.c. After three days' rest vigorous treatment was again commenced: injections of serum toxin, diphtheria toxin grown in fermented broth (D T $N^{0\cdot01}$ to D T $N^{0\cdot3}$), and a sterilised growth of *Bacillus prodigiosus* were given—nine injections in sixteen days. (See Chart No. 4, 9th to 25th.) The temperature was kept running up and down, and as soon as the swelling after each injection began to moderate another injection was given, in order, if possible, to bring about a further increase. On the 28th the serum of the blood withdrawn contained only 700 A.U. per c.c. From May 7th until May 23rd well-marked local and temporary reactions were obtained by means of injections of fermented toxin, alkali albumen toxin, and *prodigiosus* cultures, these being given at intervals of from one to four days—eight injections, varying in quantity from 200 c.c. D T $N^{0\cdot125}$ to 700 c.c. alkali albumen toxin, being given during this period. The animal was bled on the 29th of May, when the serum was found to again have a strength of 800 units per c.c. Unfortunately, this animal was not bled again until the month of July, when, after comparatively slight local and temperature reactions, the result of daily injections on the 18th, 19th, and 20th

Followed by a gradual fall.

of 700 c.c., 450 c.c., and 550 c.c. of D T $N^{0\cdot075}$, the serum value had, on the 25th, fallen to 650 units per c.c. In August, as the result of injections—600 c.c. on the 11th, 600 on the 13th, and 450 on the 15th of D T $N^{0\cdot08}$—the temperature rose to 101·8° F. (38·8° C.), and well-marked and continuous local reaction was obtained—the serum on the 18th had a strength of 600 units per c.c. Moderate reactions were obtained by the use of toxin injected on the 18th, 21st, and 24th September. The serum separated from blood drawn on the 22nd

Temperature, Swelling and Antitoxin Chart of Horse No 5.



Note.—DTN ·04, etc., should read DTN$^{0.04}$, etc. FER. = Fermented. PRODIG. = Cultivation of Bacillus Prodigiosus. ALK. ALB. = Alkaline Albumen. INTRAV. = Intravenous Injection. SUB. = Subcutaneous Injection. STER. = Sterilized by Heat. UNSTER. = Living Cultivation. S.T. = Serum Toxin.

BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum. (Each square corresponds to 10 Antitoxin Units per c.c.) L. (in Red) = Litre.

TABLE CXV.—Horse No. 5, Dun Cob, weighs 486·8 kilos. Blood—$\frac{1}{13}$ of body weight = 37·44 kilos (litres) = 18·72 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres). Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1895 May 23rd to Oct. 10th	5,858	58	1895 Oct. 22nd	4·5	50	936,000	936,000	936,000	1 to 16,138	1 to 16,138	1 c.c. Mallein on May 16th. 90 c.c. S.T.
Oct. 31st to Nov. 4th	3,375	92	Nov. 9th	6·5	50	936,000	—	1,098,500	—	1 to 11,940	
Nov. 23rd to Dec. 3rd	9,000	182	Dec. 7th	10·0	60	1,123,200	187,200	1,398,500	1 to 2,080	1 to 7,684	
1896 Jan. 11th	4,500	227	1896 Jan. 15th	8·8	90	1,684,800	561,600	1,794,500	1 to 12,480	1 to 7,464	
Jan. 22nd to Feb. 14th	6,700	294	Feb. 21st	9·0	250	4,680,000	2,995,200	2,919,500	1 to 44,704 !!	1 to 9,930	1150 c.c. S.T. Fermented.
March 10th to 24th	27,750	571	March 25th	10·5	1,000	18,720,000	14,040,000	8,169,500	1 to 50,686 !!	1 to 14,307	15 c.c. Mallein. Fermented Toxin. 400 c.c. intravenous
——	——	571	April 6th	6·0	800	14,976,000	Fall	10,569,500	Fall	1 to 18,510	
April 9th to 25th	69,000	1,261	April 28th	7·5	700	13,104,000	Fall	13,194,500	Fall	1 to 10,463	250 c.c. S.T. + 500 c.c. unster. S.T. + 300 c.c. A.A.T. + 200 c.c. prodig.
May 7th to 23rd	20,975	1,471	May 29th	12·75	800	14,976,000	1,872,000	18,294,500	1 to 8,814	1 to 12,436	Fermented Toxin period. 1200 c.c. A.A.T. + 200c.c. prodigiosus.
July 18th to 20th	12,750	1,598	July 25th	11·2	650	12,168,000	Fall	21,934,500	Fall	1 to 13,726	
Aug. 11th to 15th	13,200	1,730	Aug. 18th	12·0	600	11,232,000	Fall	25,534,500	Fall	1 to 14,759	
Sept. 18th to 24th	14,000	1,870	Oct. 22nd	11·2	550	10,296,000	Fall	28,614,500	Fall	1 to 15,301	
——	——	1,870	Nov. 21st	9·6	400	7,488,000	Fall	30,534,500	Fall	1 to 16,328	
Nov. 24th (1896) to Jan. 5th (1897)	20,500	2,075	1897 Jan. 9th	19·2	350	6,552,000	Fall	32,494,500	Fall	1 to 10,840	Intravenous.
Jan. 23rd to 25th	16,250	2,238	Feb. 5th	9·75	300	5,616,000	Fall	33,957,000	Fall	1 to 15,172	
Feb. 16th to 27th	36,450	2,602	March 4th	9·0	375	7,020,000	1,404,000	35,644,500	1 to 3,857	1 to 13,698	200 c.c. unster. S.T. Intrav.
March 6th to 13th	28,900	2,891	March 20th	9·0	400	7,488,000	468,000	37,444,500	1 to 1,619	1 to 12,952	1000 c.c. S.T., of which 300 unster. Mostly intravenous
March 30th to April 8th	2,800	2,919	April 14th	10·5	250	4,680,000	Fall	38,757,000	Fall	1 to 13,277	1150 c.c. S.T., intravenous.
April 26th to 29th	11,500	3,034	May 6th	10·5	300	5,616,000	936,000	40,332,000	1 to 8,139	1 to 13,263	650 c.c. S.T., intravenous.
June 16th to 19th	24,700	3,281	June 23rd	12·8	300	5,616,000	——	42,252,000	——	1 to 12,877	700 c.c. S.T., intravenous.
July 10th to 12th	5,600	3,337	July 17th	4·8	500	9,360,000	3,744,000	43,452,000	1 to 66,857	1 to 13,021	220 c.c. S.T.
Aug. 9th to 12th	22,200	3,559	Aug. 19th	11·2	275	5,148,000	Fall	44,992,000	Fall	1 to 12,613	
Aug. 31st to Sept. 4th	62,500	4,184	Sept. 11th	12·8	400	7,488,000	2,340,000	47,532,000	1 to 3,744	1 to 11,365	
Sept. 20th to 27th	23,000	4,414	Oct. 5th	10·4	425	7,956,000	468,000	49,762,000	1 to 2,035	1 to 11,273	100 c.c. S.T.
Oct. 11th to 15th	25,400	4,668	Oct. 25th	12·8	425	7,956,000	——	52,482,000	——	1 to 11,242	1250 c.c. S.T.
Nov. 9th to 15th	34,100	5,000	Nov. 24th	11·2	400	7,488,000	Fall	54,722,000	Fall	1 to 10,126	1450 c.c. S.T.
Dec. 1st to 9th	61,800	5,627	Dec. 20th	11·2	350	6,552,000	Fall	56,682,000	Fall	1 to 10,073	1250 c.c. S.T.
1898 Jan. 4th to 10th	39,100	6,018	1898 Jan. 17th	12·0	375	7,020,000	468,000	58,932,000	1 to 1,199	1 to 9,792	450 c.c. unster. S.T.
Feb. 2nd to 9th	30,000	6,318	Feb. 16th	12·0	375	7,020,000	——	61,182,000	——	1 to 9,692	
Feb. 28th to March 2nd	33,000	6,648	March 11th	11·0	350	6,552,000	Fall	63,107,000	Fall	1 to 9,507	1100 c.c. unster. ascit. T. 19th Mar. 1½ c.c. tuberculin
April 4th to 21st	82,000	7,468	April 25th	9·0	400	7,488,000	936,000	64,907,000	1 to 1,141	1 to 8,691	200 c.c. S.T. + 500 c.c. unster. ascit. T.

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc. In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.

October contained 550 units per c.c. The animal was then allowed to rest for another month, but was bled on the 21st November, when the strength had fallen to 400 units per c.c. On the 24th 450 c.c. D T $N^{0.15}$ was injected subcutaneously. A month later 350 c.c. D T $N^{0.1}$ was injected intravenously. Five days later—on 29th December—a similar intravenous injection was made. On neither of these occasions was there more than a slight rise of temperature. On 5th January, 1897, 200 c.c. D T $N^{0.25}$ was injected intravenously, and on the 9th January, 1897, the serum contained only 350 units per c.c. The animal was allowed to rest until the 23rd January (see Chart No. 4), when it received 400 c.c. subcutaneously, and on 25th 250 c.c. D T $N^{0.25}$. A slight rise of temperature followed the first injection, but following the second there was very little rise, although there was well-marked local reaction. On February 5th, 1897, the serum contained only 300 units per c.c. On the 16th February a course of intravenous injection was commenced which lasted for six days—until the 22nd—six injections being given in this period, the toxins used varying from 400 c.c. D T $N^{0.08}$ to 300 c.c. D T $N^{0.25}$, 1,650 c.c. being given in all; the last injection consisting of 100 c.c. of unsterilised serum toxin subcutaneously and 100 c.c. intravenously. The rise in temperature was marked. On 26th and 27th February two doses of D T $N^{0.25}$—the first of 400 c.c., the second of 350—were given subcutaneously. The local reaction was fairly marked, and after the second injection the temperature rose to 102° F. (39° C.). On the 4th of March the serum contained 375 antitoxin units per c.c. Another week of mixed injection intravenously and subcutaneously, with fairly marked local reaction, followed by a week's rest, brought the strength of the antitoxin to 400 units per c c.; but the intravenous injection of serum toxin only, even though on one occasion followed by a rise in temperature to nearly 104° F. (40° C.), or perhaps because of this, was succeeded—the blood being taken six days after this very marked rise of temperature—by a remarkable fall of the antitoxic strength, which was now down to 250 units per c.c. On May 6th it was still only 300 units. As something was evidently wrong, nothing further was done to this animal until 16th June, when a vigorous attempt was commenced to raise the antitoxic value of the serum by making frequent injections, so as to obtain a distinct cumulative action on the tissues of this horse. On 23rd June the antitoxic value of the serum had risen to 300 units per c.c., and on the 17th July to 500 units per c.c. On the 9th August injections were again given, but the temperature rose only to 100·5° F. (38° C.), and the swelling was not kept up constantly, with the result that on the 19th of August the serum contained only 275 units per c.c. From 31st August to 5th September a continuous swelling was kept up by four injections of fairly strong toxin; 800 c.c. D T $N^{0.3}$ being given on the first day, 1,000 c.c. D T $N^{0.1}$ on the second day, 900 c.c. D T $N^{0.1}$ on the third day, and 650 c.c. D T $N^{0.3}$ on the fourth day. The temperature never rose beyond 100·5° F. (38° C.), but on the 11th the serum contained 400 antitoxin units c.c. By somewhat similar treatment the strength of this serum was fairly well maintained, the best results usually being obtained after a continuous local reaction, and when the temperature rose beyond 101° on several occasions during the course of treatment. On the 5th October the strength of the serum was 425 units per c.c.; on the 25th October, 425; on the 24th November, 400; and on 20th December, 350 units per c.c. On the latter part of Chart No. 4 we have the record of the treatment and its results during the first four months of 1898. In these experiments toxin of considerably greater activity than that previously used for any lengthened period was available, and it is quite possible that the maintenance or even slight rise in the strength of antitoxic value of the serum may be due to this factor. In the earlier months the local reactions were marked and well maintained, but the temperature reactions were not pronounced. When, however, the strong toxin (D T $N^{1.4}$) was used, the sudden rises and falls in both temperature and local reactions are exceedingly well marked, whilst there is also a distinct rise in the antitoxic value of the serum—*i.e.*, from 350 to 400 units per c.c. This is a point of some importance in connection with the keeping up of the strength of the serum in horses that have been under treatment for any considerable length of time.

Temporary rise followed by a fall in potency.

Horse No. 6, "Grey Cob."—Table CXVI.

The commencement of the treatment of this horse, which was carried out by Dr. Wood, was made on the 2nd of July, 1895, when 120 c.c. of broth toxin heated to 65° C. was injected. There was a slight swelling only, and a rise of temperature to a little over 100·2° F. (37·9° C.). On the 6th an injection of 150 c.c. of the same material was followed by fairly well-marked swelling and a temperature of 101·8° F. (38·8° C). On the 13th the injection of 100 c.c. of serum toxin heated for one hour to 65° C. was followed by a slight swelling only, but the temperature was 102° F. (39° C.); on the 20th 350 c.c. D T $N^{0.08}$ and 50 c.c. of serum toxin were injected. This was followed by considerable swelling, which persisted for three days, and the temperature rose to 101·5° F. (38·6° C.). Comparatively small injections of D T $N^{0.04}$ along with serum toxin were given on the 29th and 31st July, the 7th, 12th, 15th, and 30th August. On the 16th September the serum was tested, and was now found to contain only about 12½ units per c.c. On the 23rd, 27th, and 30th September, and the 5th and 12th October, mixtures of D T $N^{0.04}$ and serum toxin (450 c.c. in all) were given, and on three occasions the temperature rose to between 102° and 103° F. (39° and 39·5° C.).

Slow rise of potency.

On the 26th and 31st October and 4th November, injections, each of about 400 c.c. D T $N^{0.2}$, were given, fairly well-marked swellings were obtained, but the temperature did not rise beyond 101° F. (38·3° C.).

On the 9th of November the serum contained 60 antitoxin units per c.c. The animal only received two further injections of toxin—one on the 23rd November (600 c.c.), and one on the 3rd December (650 c.c.), weak toxin (D T $N^{0.15}$); and on the 7th the serum still contained 60 units per c.c. It still had the same strength on the 15th January, 1896, four injections having been given at

TABLE CXVI.—Horse No. 6, Grey Cob, weighs 390 kilos. Blood—$\frac{1}{13}$ of body weight = 30 kilos (litres) = 15 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres). Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1895			1895								
July 13th to Aug. 30th	4,570	46	Sept. 16th	2·4	12	180,000	180,000	180,000	1 to 3,913	1 to 3,913	June 10th 1 c.c. Mallein. 400 c.c. S.T.
Sept. 23rd to Nov. 4th	18,800	234	Nov. 9th	4·0	60	900,000	720,000	300,000	1 to 3,829	1 to 1,282	615 c.c. S.T.
Nov. 23rd to Dec. 3rd	18,750	421	Dec. 7th	2·8	60	900,000	—	384,000	—	1 to 912	
1896			1896								
Dec. 14 (1895) to Jan. 11	9,400	515	Jan. 15th	6·4	60	900,000	—	576,000	—	1 to 1,118	950 c.c. S.T.
Jan. 29th to Feb. 15th	4,750	562	Feb. 21st	9·6	60	900,000	—	864,000	—	1 to 1,537	750 c.c. S.T.
March 10th to April 1st	24,200	804	April 3rd	11·2	150	2,250,000	1,350,000	1,704,000	1 to 5,578	1 to 2,119	22 c.c. tuberculin. 600 c.c. S.T. + 100 c.c. A.A.T.
April 10th to 25th	26,275	1,067	April 28th	9·6	120	1,800,000	Fall	2,280,000	Fall	1 to 2,136	500 c.c. A.A.T. + 650 c.c. S.T. 100 c.c. prodigiosus.
May 7th to 27th	12,725	1,195	June 3rd	10·4	100	1,500,000	Fall	2,800,000	Fall	1 to 2,343	700 c.c. A.A.T. 200 c.c. prodigiosus.
July 28th to Aug. 3rd	2,400	1,219	Aug. 6th	10·4	60	900,000	Fall	3,112,000	Fall	1 to 2,544	
Sept. 19th to 22nd	4,000	1,259	Oct. 22nd	9·6	50	750,000	Fall	3,352,000	Fall	1 to 2,662	

TABLE CXVII.—Horse No. 7, Big Chestnut, weighs 507 kilos. Blood—$\frac{1}{13}$ of body weight = 39 kilos (litres) = 19·5 litres serum.

1895			1895								
Sept. 26th to Nov. 16th	—	—	Dec. 2nd	0·6	60	1,170,000	1,170,000	1,170,000	—	—	Aug. 28th 1 c.c. Mallein. 2250 c.c. S.T.
1896			1896								
Dec. 3 (1895) to April 1	31,365	313	April 3rd	11·2	60	1,170,000	—	1,506,000	—	1 to 4,811	2400 c.c. S.T. + 150 c.c. A.A.T. 140 c.c. prodig., some intravenous.
April 16th to June 1st	30,375	617	June 3rd	11·2	80	1,560,000	390,000	1,954,000	1 to 1,282	1 to 3,166	1350 c.c. S.T. + 250 c.c. prodigiosus. Fermented Toxin period.
July 29th to Aug. 1st	2,800	645	Aug. 6th	12·8	70	1,365,000	Fall	2,402,000	Fall	1 to 3,724	Fermented Toxin, impure.

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc.

In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.

fairly long intervals up to the 11th (600 c.c. in all). From the 29th of January to the 15th of February injections at intervals of two or three days were given, these consisting usually of about from 200 to 600 c.c. D T $N^{0·01}$ to D T $N^{0·04}$ and 750 c.c. of serum toxin, divided into three doses. The temperature was kept up at above 101° F. (38·3° C.) after each injection—on two occasions running above 101·5° F. (38·6° C.). In each case the injections were made as soon as the swellings, which were well marked in each case, had disappeared. On the 21st the blood again contained only 60 units per c.c. By means of large and repeated doses of tuberculin (total 22 c.c.), followed by D T $N^{0·02}$ and D T $N^{0·085}$ in considerable quantities (1,000 c.c. in all), a marked swelling was kept up from the 13th to the 19th March, the temperature running up on the 15th and 19th to 104° F. (40° C.). After a few days' rest the injections were again commenced on the 27th, and were repeated on the 30th March and 1st of April. As a result of all this, the serum now contained 15 units per c.c. Serum toxin, albumen toxin, and heated *prodigiosus* cultures injected along with D T $N^{0·1}$ and D T $N^{0·3}$ caused the temperature to be kept comparatively high throughout the next period, but with rapid rises and falls. Six injections being given from the 10th to the 25th of April, the swelling was fairly continuous, with the exception of about four days in the middle of the period. As soon as the last swelling had disappeared—April the 28th—the animal was bled, when the serum was found to contain 120 antitoxin units per c.c. Injections of sterilised *prodigiosus* cultures were given along with alkali albumen toxin on the 7th, the 14th (+250 c.c. D T $N^{0·125}$), 16th (250 c.c. D T $N^{0·1}$), and 18th May (350 c.c. of the same toxin), and on the 23rd and 27th D T $N^{0·08}$ was given in doses of 250 and 200 c.c. On June 3rd the strength of the antitoxin *was found to have fallen* to 100 antitoxin units per c.c. Nothing further was done to this horse until the 28th July, when it received 300 c.c. D T $N^{0·04}$, and a similar dose on the 3rd of August. On the 6th the strength of the serum was 60 units per c.c. In October the strength had further fallen to 50 units, and it was decided not to use any more of the serum from this horse for the treatment of diphtheria patients.

Fall in strength under action of *B. prodigiosus*.

Horse No. 7, "Big Chestnut Mare."—Table CXVII.

Animal did not stand treatment well.

Treatment of this mare was commenced on the 26th of September, 1895. Between that date and the 1st October it received in three injections 430 c.c. of serum toxin, the temperature after the first injection going up to 102·5° F. (39·2° C.). Six other injections were four of serum toxin (1,540 c.c.) and two of heated toxin (540 c.c.) up to the 16th November, one on the 29th October being followed by some local suppuration. Well-marked reactions, both as regards swelling and temperature, were obtained throughout. On the 2nd December the serum contained 60 antitoxin units per c.c. As the animal after this date did not stand injections well, they were discontinued until the 31st January, 1896, after which four injections were given up to the 10th February: they were still borne badly, and were discontinued until the 10th March, 1896, after which, up to the 1st of April, 11 injections of toxin, and serum toxin or *prodigiosus* culture, were given at intervals every time the temperature had fallen to the normal and the swelling had disappeared.

On April the 3rd the potency of the serum still remained at 60 units per c.c. From the 7th of May to the end of that month the same continuous method of treatment was employed, and on the 3rd of June the serum contained 80 units per c.c. There was no further treatment until the 29th July, and then again on the 1st of August. On both occasions the temperature rose to 102° F. (39° C.), and from the 29th of July to the 4th of August a continuous swelling was maintained. On the 6th the serum had a value of 70 units per c.c. This serum was not used, nor was any further serum from this horse put into circulation.

Horse No. 8, "Big Dun Gelding."—Chart No. 5 and Table CXVIII.

Toxin and antitoxin treatment.

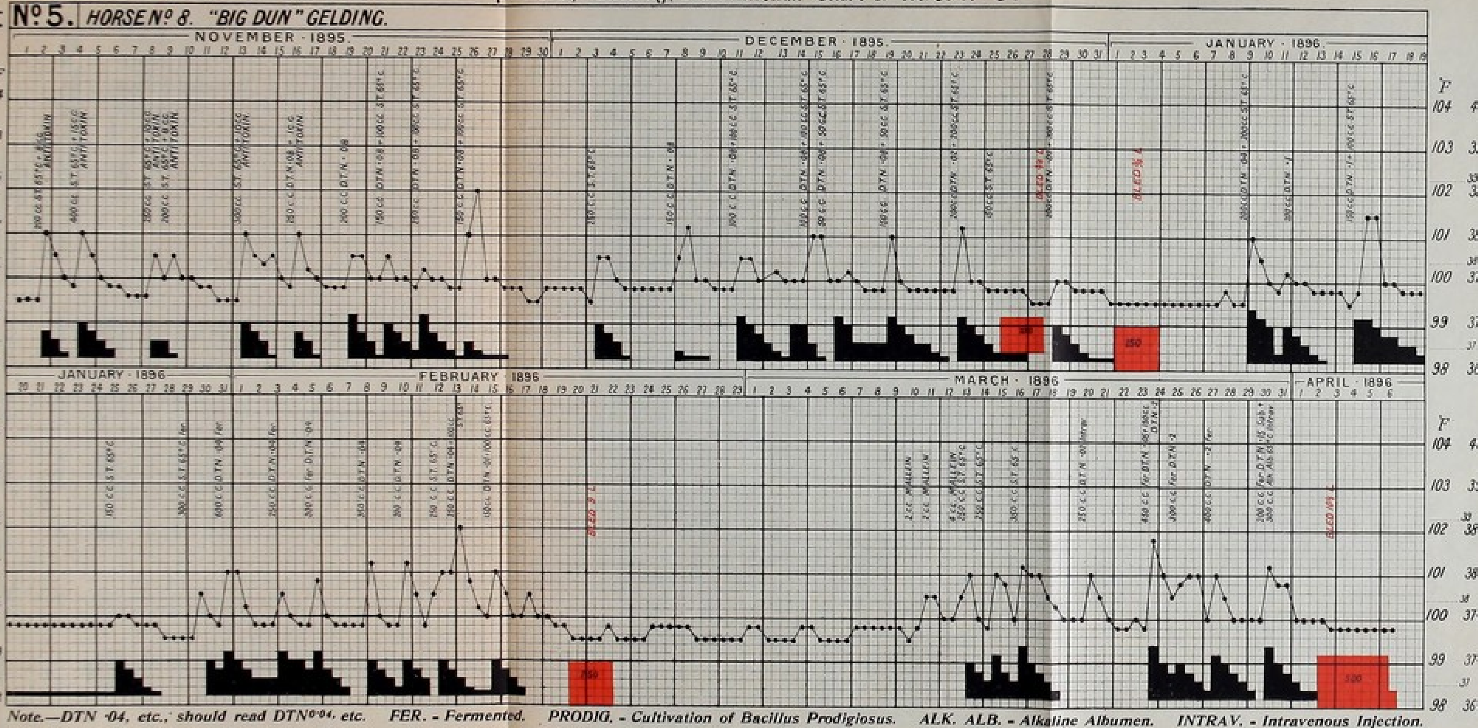
Treatment of this horse was commenced on 2nd November, 1895, and was continued until December 28th. On the 2nd, 4th, 8th, 9th, and 13th November it received large doses of serum toxin (1,350 c.c. in all), along with antitoxin; the antitoxin not being sufficient to prevent the rise of temperature to 101° F. (38·3° C.), or to prevent the occurrence of local swelling. Following these injections came twelve injections with D T $N^{0·08}$ (1,350 c.c. in all) and serum toxin (1,200 c.c.), all sufficient to cause a rise of temperature and a swelling of considerable size. On 28th December the serum contained 200 antitoxin units per c.c., and on the 3rd of January, 1896, 250 units. Up to 25th of January only three further injections were given; but after this, and up to the 15th February, ten injections of D T $N^{0·01}$ and serum toxin—sufficient to obtain a marked reaction on each occasion—were made, a fresh injection being given within 24 hours of the disappearance of each swelling. On the 21st of February the antitoxic value of the serum still remained at 250 units per c.c. From the 16th February to the 10th of March no treatment was carried out, but on that date and the two following days considerable doses of mallein were given; this being followed by injections, at intervals of from two to three days, of serum toxin, alkali albumen toxin, and ordinary toxin (D T $N^{0·02}$ to D T $N^{0·2}$), up to the 30th of March, one of the injections—that on the 20th of March—being intravenous. On the 3rd of April the serum had a value of 500 antitoxin units per c.c. (end of Chart 5). From the 10th to the 25th of April five injections (D T $N^{0·01}$ to D T $N^{0·3}$, 2,100 c.c.) were made—to one, serum toxin being added, and to another a culture of *B. prodigiosus*.

Effect of cumulative treatment.

It is interesting to note that on the 28th the serum contained only 300 units of antitoxin per c.c.; but seven injections, made between the 7th and the 26th May—four of them containing *prodigiosus*, and one of them alkali albumen toxin—the swelling and temperature being maintained throughout, again brought up the antitoxic value of the serum to 350 units per c.c. No further treatment was afterwards carried out until July the 18th, 1896, when three injections were given on successive days—550 c.c. D T $N^{0·075}$ on the first day. 350 c.c. of the same toxin

Temperature, Swelling, and Antitoxin Chart of Horse Nº 8.

Chart Nº 5. HORSE Nº 8. "BIG DUN" GELDING.



Note.—DTN ·04, etc., should read DTN$^{0·04}$, etc. FER. - Fermented. PRODIG. - Cultivation of Bacillus Prodigiosus. ALK. ALB. - Alkaline Albumen. INTRAV. - Intravenous Injection. SUB. - Subcutaneous Injection. STER. - Sterilized by Heat. UNSTER. - Living Cultivation. S.T. - Serum Toxin. BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum: (Each square corresponds to 10 Antitoxin Units per c.c.)· L. (in Red) - Litre.

TABLE CXVIII.—Horse No. 8, Big Dun, weighs 520 kilos. Blood—$\frac{1}{13}$ of body weight = 40 kilos (litres) = 20 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres). Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1895 Nov. 2nd to Dec. 28th	12,800	128	1895 Dec. 28th	0·6	200	4,000,000	4,000,000	4,000,000	1 to 31,250 ! !	1 to 31,250 ! !	Oct. 3rd 1 c.c. Mallein. 52 c.c. antitoxin. 2550 c.c. S.T.
1896	—	—	1896 Jan. 3rd	0·6	250	5,000,000	1,000,000	4,075,000	—	—	
Jan. 3rd to Feb. 15th	12,650	254	Feb. 21st	7·2	250	5,000,000	—	4,975,000	—	1 to 19,586	1400 c.c. S.T.
March 10th to 30th	22,750	481	April 3rd	8·4	500	10,000,000	5,000,000	7,075,000	1 to 2,202	1 to 14,708	8 c.c. Mallein. 850 c.c. S.T. + 300 c.c. A.A.T. Fermented Toxin period.
April 10th to 25th	13,300	614	April 28th	12·0	300	6,000,000	Fall	8,875,000	Fall	1 to 14,454	500 c.c. S.T. + 50 c.c. prodigiosus. Fermented Toxin period.
May 7th to 26th	16,275	777	May 29th	12·8	350	7,000,000	1,000,000	11,115,000	1 to 6,134	1 to 14,305	1050 c.c. A.A.T. + 200 c.c. prodigiosus. Fermented Toxin period.
July 18th to 20th	69,300	1,470	July 25th	11·2	250	5,000,000	Fall	12,515,000	Fall	1 to 8,513	
Aug. 11th to Sept. 21st	20,700	1,677	Oct. 22nd	12·0	200	4,000,000	Fall	13,715,000	Fall	1 to 8,178	

TABLE CXIX.—Horse No. 9, "Good Friday," weighs 455 kilos. Blood—$\frac{1}{13}$ of body weight = 35 kilos (litres) = 17·5 litres serum.

1896 Jan. 25th to Feb. 3rd	—	—	1896 Feb. 3rd	0·4	30	525,000	525,000	525,000	—	—	1500 c.c. S.T.
Feb. 5th to 22nd	7,300	73	Feb. 23rd	1·5	125	2,187,500	1,662,500	618,750	1 to 22,774	1 to 8,476	2430 c.c. S.T.
Feb. 24th to March 23rd	13,000	203	March 25th	10·5	180	3,150,000	962,500	1,563,750	1 to 7,403	1 to 7,703	800 c.c. S.T. + 100 c.c. prodigiosus.
April 10th to 18th	22,975	432	April 21st	10·5	125	2,187,500	Fall	2,220,000	Fall	1 to 5,138	250 c.c. S.T. + 150 c.c. prodig. Fermented Toxin period.
May 7th to June 1st	34,875	781	June 3rd	10·5	140	2,450,000	262,500	2,955,000	1 to 752	1 to 3,780	950 c.c. A.A.T. + 200 c.c. prodigiosus. Fermented Toxin period.

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc.

In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.

on the second day, and 300 c.c. D T $N^{0\cdot06}$ on the third; the temperature going up to 102·5° F. (39·2° C.), and the swelling being maintained for four days. On the 25th the serum contained only 250 antitoxin units per c.c. In August a similar result was obtained. In September, from the 18th to the 21st, the animal was similarly treated, but was not bled until the 22nd of October. The serum was then found to contain only 200 units per c.c. This had fallen somewhat in November, still further in December, January, and February, and after this date the serum was no longer used.

Horse No. 9, Gelding, "Good Friday."—Chart No. 6 and Table CXIX.

This horse was treated by Dr. Wood in order to determine whether or no injections of serum toxin (heated to 65°) alone would prepare a horse rapidly for the reception of considerable quantities of D T N, and whether thus the process of obtaining antitoxin might not be considerably shortened.

Preliminary treatment with serum toxin alone.

On the 25th January, 1896, this horse received 300 c.c. of serum toxin subcutaneously, and again on the 27th, 29th, and 31st of January, and on the 3rd of February it received the same dose. On only one occasion did the temperature run up to 101° F. (38·3° C.) (on the 31st January), but there was a fairly continuous swelling and constant local reaction during the whole, or almost the whole, of this period. The result, though partially anticipated, was most startling. On the 3rd of February (or in 10 days) the serum contained 30 antitoxin units per c.c., although up to this date not a drop of ordinary diphtheria toxin had been injected.

By means of frequent injections of serum toxin and D T $N^{0\cdot01}$ to D T $N^{0\cdot08}$ (12 injections between the 3rd and 22nd February) the temperature was kept at, or near, 101° F. (38·3° C.), on two occasions running up to 102° F. (39° C.) or over; the swelling was more or less continuous during the whole of this period. On the 24th of February (or exactly 31 days from the commencement of treatment) serum drawn from this animal contained 125 units per c.c. On the same day another injection of serum toxin—350 c.c.—and 250 c.c. D T $N^{0\cdot01}$ produced an immediate rise of temperature to 102° F. (39° C.), and a marked local reaction. Treatment was then discontinued until the 10th of March, when 450 c.c. D T $N^{0\cdot15}$ was injected subcutaneously. On the 11th, 50 c.c. of sterilised *prodigiosus* was injected (see chart), a similar quantity of the same substance on the 12th, and on the 13th and 14th 250 c.c. and 200 c.c. of serum toxin. Then from the 15th to the 23rd the horse received 1,100 c.c. of D T $N^{0\cdot1}$ (average), 250 c.c. of this being injected intravenously. On the 25th of March the serum of this horse contained 180 antitoxin units per c.c.

From the 10th to the 18th of April considerable quantities—2,225 c.c. of D T $N^{0\cdot15}$ (average)—a small quantity of serum toxin on one occasion, and *prodigiosus* on three occasions (six injections in all), were given. The swelling set up was maintained continuously, but the temperature never rose beyond 100·5° F.(38° C.). Blood taken on the 21st contained only 125 antitoxin units per c.c. A further attempt was made during May to raise the antitoxic value of the blood of this horse (see chart), the blood taken on the 3rd of June contained 140 units per c.c.; but after this date the serum from this horse was not again used.

Horse No. 10, "White-Faced Bay Gelding."—Chart No. 7 and Table CXX.

A good example of the "rapid" method of treatment.

The record from this horse affords an excellent illustration of the rapid method of obtaining antitoxin as compared with the method recorded in the case of Horse No. 1 (see Chart No. 1). It will be seen that during the first six days of treatment this animal received subcutaneously 1,040 c.c. of serum toxin. There was a gradual and progressive rise of temperature after each injection up to the sixth day, and a local reaction was obtained—not very marked, but fairly well continued. On the seventh day, although no ordinary toxin had been given, the serum separated from the blood contained 10 antitoxin units per c.c. During the next five days the animal received 1,600 c.c. of serum toxin, the largest dose (500 c.c.) being followed by the most marked swelling and the greatest rise of temperature—103° F. (39·5° C.).

A strength of 100 A.U. obtained in 14 days, 550 A.U. in 35 days.

Fourteen days after the commencement of treatment the strength of the serum had risen to 100 units per c.c.—a strength more than twice as great as that usually obtained by the ordinary method in ten weeks. The local and temperature reactions were, as will be seen from the chart, very marked and continuous from the 2nd to the 13th of February; this condition of unstable equilibrium being maintained by the injection, subcutaneously and intravenously, of serum toxin and D T $N^{0\cdot25}$, etc. On two occasions the temperature rose to 104° F. (40° C.), and on at least two others to 103° F. (39·4° C.). The animal, bled on the 13th, gave a serum containing 275 antitoxin units per c.c. The treatment was still continued vigorously from the 15th to the 19th, four intravenous and one subcutaneous injections being given during this period, one injection being of unsterilised serum toxin. On the 20th the value of the serum had made a tremendous jump— it had now reached 500 units per c.c. Just five weeks after the treatment was commenced, after three more injections (see chart), the animal was again bled—on the 2nd of March—when the value of the serum was 525 units per c.c. From this point onwards the treatment was, of course, carried out less continuously, with the result that on March 20th the strength of the serum had fallen to 400 units per c.c., and to 350 on April the 14th. On May the 6th it had risen to 400 units per c.c., after a comparatively sharp but short treatment. From this point onwards there was nothing special about the serum. The treatment during June was very much like that carried on at the end of March and the beginning of April, but the serum varied very much in value during the following period. For instance, after a short rise, followed by a sharp reaction, in the middle of June, the serum was only about 170 units per c.c.; three weeks later, after a sharp reaction, it had risen to 450 units per c.c., falling again in August to 250; in September, after six

Chart No. 6. HORSE No. 9. "GOOD FRIDAY" GELDING.

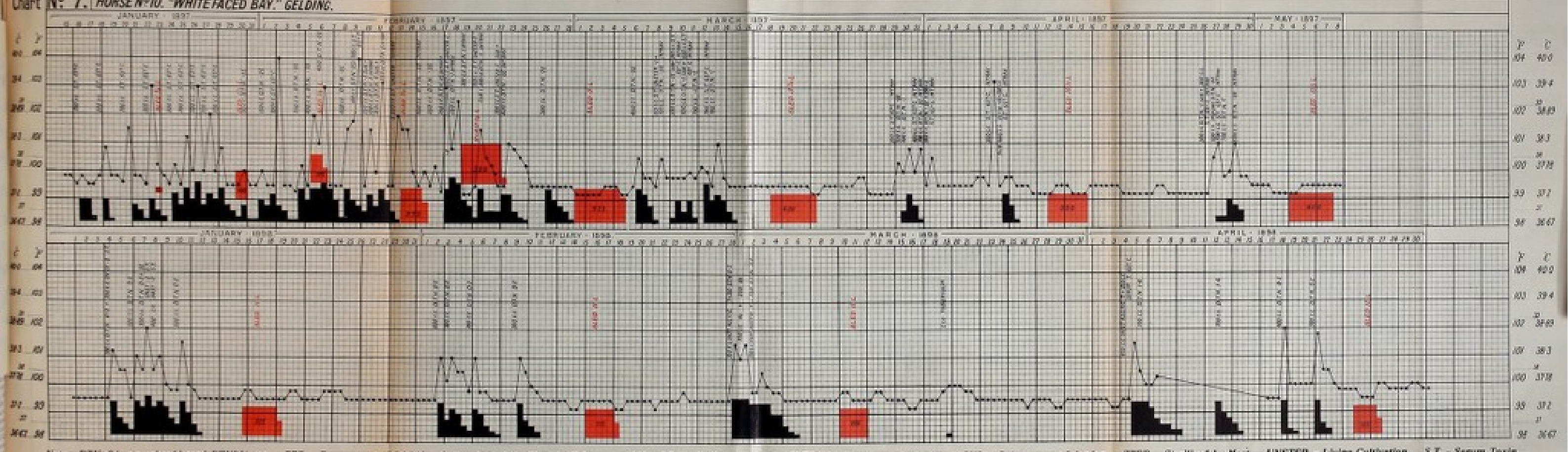
Temperature, Swelling, and Antitoxin Chart of Horse No. 9.

Note.—DTN '94, etc., should read DTN^{94}, etc. FER. = Fermented. PRODIG. = Cultivation of Bacillus Prodigiosus. ALK. ALB. = Alkaline Albumen. INTRAV. = Intravenous Injection. SUB. = Subcutaneous Injection. STER. = Sterilized by Heat. UNSTER. = Living Cultivation. S.T. = Serum Toxin.

BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum. (Each square corresponds to 10 Antitoxin Units per c.c.) L. (in Red) = Litre.

Temperature, Swelling, and Antitoxin Chart of Horse No. 10.

Chart No. 7. HORSE No. 10. "WHITE FACED BAY." GELDING.



Note.—DTN ·94, etc., should read DTN[·94], etc. FER. = Fermented. PRODIG. = Cultivation of Bacillus Prodigiosus. ALK. ALB. = Alkaline Albumen. INTRAV. = Intravenous Injection. SUB. = Subcutaneous Injection. STER. = Sterilized by Heat. UNSTER. = Living Cultivation. S.T. = Serum Toxin.

BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum. (Each square corresponds to 10 Antitoxin Units per c.c.) L. (in Red) = Litre.

TABLE CXX.—Horse No. 10, White Faced Bay, weighs 521·8 kilos. Blood—$\frac{1}{13}$ of body weight = 40 kilos (litres) = 20 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres). Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1897 —	—	—	1897 Jan. 9th	0·8	1	20,000	20,000	20,000	—	—	1½ c.c. Mallein on Dec. 7th, 1896.
Jan. 16th to 22nd	—	—	Jan. 23rd	0·75	10	200,000	180,000	23,750	—	—	1030 c.c. S.T.
Jan. 24th to 28th	—	—	Jan. 30th	1·5	100	2,000,000	1,800,000	98,750	—	—	1600 c.c. S.T.
Jan. 30th to Feb. 5th	20,000	200	Feb. 6th	0·75	125	2,500,000	500,000	145,625	1 to 2,500	1 to 728	200 c.c. unsterilised S.T.
Feb. 6th to 12th	39,250	592	Feb. 13th	0·75	275	5,500,000	3,000,000	248,750	1 to 7,607	1 to 420	350 c.c. unsterilised S.T.
Feb. 15th to 20th	33,250	925	Feb. 20th	0·75	500	10,000,000	4,500,000	436,250	1 to 13,554 ! !	1 to 471	300 c.c. unsterilised S.T.
Feb. 20th to 26th	17,000	1,095	March 2nd	9·0	525	10,500,000	500,000	2,798,750	1 to 2,941	1 to 2,556	Intravenous. 450 c.c. unsterilised S.T.
March 6th to 13th	38,750	1,482	March 20th	9·75	400	8,000,000	Fall	4,748,750	Fall	1 to 3,204	Intravenous. 1700 c.c. S.T.
March 29th to April 8th	6,500	1,547	April 14th	10·5	350	7,000,000	Fall	6,586,250	Fall	1 to 4,257	Intravenous. 1350 c.c. S.T.
April 26th to 29th	11,400	1,661	May 6th	10·5	400	8,000,000	1,000,000	8,686,250	1 to 8,772	1 to 5,229	Intravenous. 800 c.c. S.T.
June 16th to 19th	24,500	1,906	June 23rd	12·8	175	3,500,000	Fall	9,806,250	Fall	1 to 5,150	Intravenous. 450 c.c. S.T.
July 10th to 13th	21,800	2,124	July 19th	4·8	450	9,000,000	5,500,000	10,886,250	1 to 25,229 ! !	1 to 5,134	220 c.c. S.T.
Aug. 9th to 12th	18,400	2,308	Aug. 19th	11·2	250	5,000,000	Fall	12,286,250	Fall	1 to 5,366	
Aug. 31st to Sept. 4th	48,000	2,788	Sept. 11th	12·8	400	8,000,000	3,000,000	14,846,250	1 to 6,250	1 to 5,325	
Sept. 20th to 27th	27,000	3,058	Oct. 5th	10·4	275	5,500,000	Fall	16,276,250	Fall	1 to 5,322	Impure Toxin.
Oct. 11th to 15th	38,400	3,442	Oct. 25th	12·8	310	6,200,000	700,000	18,260,250	1 to 1,823	1 to 5,305	1150 c.c. unsterilised S.T.
Nov. 9th to 14th	40,600	3,848	Nov. 24th	11·2	325	6,500,000	300,000	20,080,250	1 to 739	1 to 5,218	1450 c.c. unsterilised S.T.
Dec. 1st to 9th	51,050	4,359	Dec. 20th	11·2	325	6,500,000	—	21,900,250	—	1 to 5,024	830 c.c. S.T.
1898 Jan. 4th to 10th	49,700	4,856	1898 Jan. 17th	8·8	325	6,500,000	—	23,330,250	—	1 to 4,804	635 c.c. unsterilised S.T.
Feb. 2nd to 9th	26,000	5,116	Feb. 16th	8·8	275	5,500,000	Fall	24,540,250	Fall	1 to 4,796	
Feb. 28th to March 1st	19,000	5,306	March 11th	8·8	250	5,000,000	Fall	25,640,250	Fall	1 to 4,832	950 c.c. unsterilised Ascitic Toxin. March 19th, 2 c.c. tuberculin.
April 4th to 21st	74,000	6,046	April 26th	9·6	225	4,500,000	Fall	26,720,250	Fall	1 to 4,419	230 c.c. S.T. + 470 c.c. unsterilised Ascitic Toxin.

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc.

In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.

days' reaction, it rose to 400; falling on the 5th of October to 275; rising to 310 on the 25th of the same month—the result of a prolonged reaction; and it remained at this figure practically until the end of the year—330 units per c.c. on the 29th of November, and 325 units per c.c. on the 20th of December, both these after well-marked and continuous reactions—the temperature during the last series rising to over 103° F. (39·5° C.). In order to show how the strength of the serum falls off when the treatment is only intermittent, even when good local and temperature reactions are obtained, we may refer to the same chart, in which is included a period extending from January, 1898, to April, 1898. It will be seen that in the first ten days of January good reactions were obtained, and on the 17th of the month the value of the serum remained the same as in December—325 units per c.c. The animal was then allowed to rest for about a fortnight, at the end of which time three reactions were obtained in seven days by means of four injections; the temperature never rose beyond 101° F. (38·3° C.), and the swelling was not continuous. On the 16th the serum had a value of only 275 units per c.c. After another rest, a series of well-marked reactions, extending over four days, was obtained by means of three injections: the animal, bled nine days afterwards, gave a serum now of only 250 units per c.c. After a still longer rest, during which the animal was carefully tested with tuberculin, with absolutely negative results, another series of four reactions, extending over a period of about three weeks, was obtained; but on the 26th of April, instead of a rise, there had been a further slight fall to 225 units per c.c. It is evident, then, from a study of this case, that by means of the preliminary serum toxin treatment it is possible to obtain antitoxin of high potency very quickly, but that after the highest point has been attained it may be a somewhat difficult matter to maintain this level without having recourse to very active treatment of the animals—a treatment which, of course, it is impossible they can stand for any lengthened period, as it is absolutely necessary that they should be maintained in a high state of health, as evidenced by their power to assimilate food and to gain weight, and by the condition of the coat. The antitoxin-producing power rises very rapidly under the serum toxin treatment, but the cells appear to undergo certain modifications, as a result of which they are less susceptible to the specific stimulus of the serum toxin, and even of ordinary toxin; and in this case it was only by means of enormously increased doses of toxin acting locally that we were able to stimulate the cells sufficiently to keep them up at the high antitoxin-forming level, the immunity of the tissues being increased at a greater rate than the antitoxin-forming powers.*

Strength of serum falls off when treatment is intermittent.

High state of health necessary.

Horse No. 11, "Big Bay Gelding."—Chart No. 8 and Table CXXI.

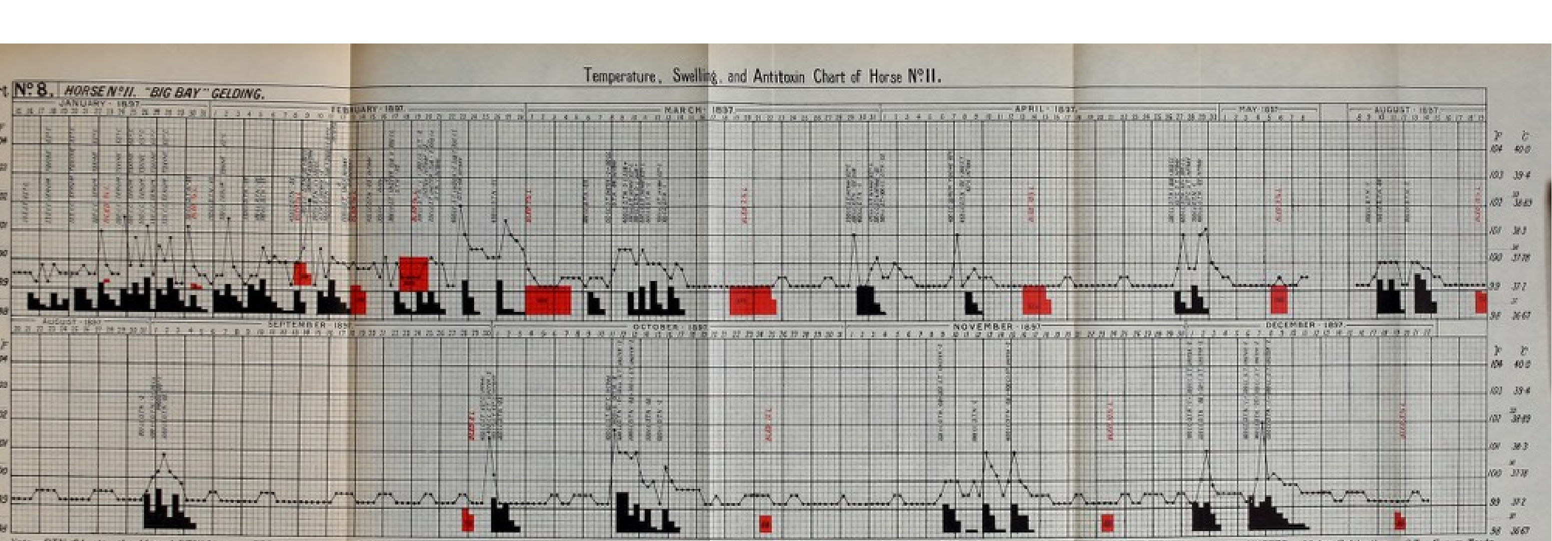
This horse was also taken by Dr. Wood for the purpose of testing the efficacy of his method of rapidly preparing animals for the reception of considerable doses of toxin by means of large preliminary injections of serum toxin. The result was almost exactly the same as in the case of Horse No. 10, except that the rise was perhaps scarcely so rapid as in the former case. Between the 16th and 22nd of January, 1897, 1,020 c.c. of serum toxin was injected at four injections. On the 23rd the serum had a value of 5 antitoxin units per c.c. During the next five days 1,800 c.c. of serum toxin was injected: on the 30th of January the blood was found to contain 15 units of antitoxin per c.c. On the same date 50 c.c. D T $N^{0 \cdot 25}$ was injected subcutaneously, but was followed by little local reaction; on the 1st of February 170 c.c. D T $N^{0 \cdot 25}$ was injected. This was followed by considerable swelling, but there was no rise of temperature until 300 c.c. of serum toxin was injected on the 2nd of February, when the temperature rose to 101·5° F. (38·6° C.). On the 4th of February, or 20 days from the commencement of treatment, 350 c.c. of D T $N^{0 \cdot 25}$ was injected, and although it caused considerable swelling the temperature rose only to 100·5° F. (38° C.) On the 9th of February, after several subcutaneous injections of toxin had been given, the strength of the serum had risen to 100 units per c.c.; and on the 13th, after several intravenous injections of toxin and serum toxin, the antitoxic value had risen to 140 units per c.c. On the 19th, after four other intravenous injections, in which 1,400 c.c. D T $N^{0 \cdot 25}$ and 300 c.c. of serum toxin had been injected, the strength had risen to 300 units per c.c.; on the 20th and 22nd further intravenous injections were made; and on the 26th 400 c.c. D T $N^{0 \cdot 25}$ was injected subcutaneously. These injections were followed by smart temperature reactions, but the local swelling was in no case very marked. On the 1st of March, or 46 days after the treatment had been commenced, the serum had a value of 400 units per c.c. After this, again, the treatment was somewhat intermittent. It may, however, be followed in the chart, from which it will be seen that there is a steady fall in the strength of the antitoxin, which can only be accounted for by the fact that the temperature and local reactions were not nearly so marked or so continuous as during the earlier periods of treatment. It will be noted, probably as a consequence of this, that on March the 20th the value of the serum had gone down to 375 units per c.c., on the 14th of April to 225, and on the 6th of May to 150 units per c.c. The following figures are given for the purpose of affording some idea of the variations of the serum at different times and under different conditions, and of the difficulty of maintaining above a certain level the antitoxin-forming power in horses after they have been under treatment for a prolonged period. On the 22nd of June the serum had a value of only 90 units per c.c.; but on July 17th, after a period of continual stimulation, and a local reaction which lasted for five days, it had risen to 175, only to fall, 24 days later, to 120 units per c.c. After this date, although several well-marked but isolated reactions were obtained—reactions which were never prolonged for more than a day or two—the antitoxic value of the serum never again reached 100. On the 20th of December the serum contained 50 antitoxin units per c.c., after which date it was not used for treatment of cases in the hospitals; but a quantity of it was used in a series of preliminary experiments made

400 A.U. in 46 days.

* Since this was written, by means of frequent injections of strong toxins, the antitoxic value of the serum from this horse has again been raised to 425 units per c.c.

Temperature, Swelling, and Antitoxin Chart of Horse No. II.

Chart No. 8. HORSE No. II. "BIG BAY" GELDING.



Note.—DTN '04, etc., should read DTN^{o} ^{4}, etc. FER. - Fermented. PRODIG. - Cultivation of Bacillus Prodigiosus. ALK. ALB. - Alkaline Albumen. INTRAV. - Intravenous Injection. SUB. - Subcutaneous Injection. STER. - Sterilized by Heat. UNSTER. - Living Cultivation. S.T. - Serum Toxin.

BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum. (Each square corresponds to 10 Antitoxin Units per c.c.) L. (in Red) - Litre.

TABLE CXXI.—Horse No. 11, Big Bay, weighs 423 kilos. Blood—$\frac{1}{13}$ of body weight = 32·5 kilos (litres) = 16·25 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres). Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1897			1897								
—	—	—	—	—	—	—	—	—	—	—	29th December, 1896, 1½ c.c. Mallein.
Jan. 16th to 22nd	—	—	Jan. 23rd	0·75	5	81,250	81,250	81,250			920 c.c. S.T.
Jan. 24th to 30th	1,250	12	Jan. 30th	0·75	15	243,750	162,500	6,875	1 to 13,541	1 to 7,239	1800 c.c. S.T.
Feb. 1st to 9th	33,000	342	Feb. 9th	0·75	100	1,625,000	1,381,250	124,375	1 to 4,185	1 to 363	300 c.c. S.T.
Feb. 9th to 13th	25,125	594	Feb. 13th	0·75	140	2,375,000	750,000	176,875	1 to 2,976	1 to 297	Intravenous injection. 125 c.c. S.T. + 250 c.c. unsterilised S.T.
Feb. 15th to 19th	31,000	904	Feb. 19th	0.75	300	4,875,000	2,500,000	289,375	1 to 8,064	1 to 320	300 c.c. unsterilised S.T.
Feb. 19th to 26th	38,600	1,290	March 1st	7·5	400	6,500,000	1,625,000	1,789,375	1 to 4,209	1 to 1,387	920 c.c. S.T., half intrav.
March 6th to 13th	38,100	1,671	March 20th	2·25	375	6,093,750	Fall	2,211,250	Fall	1 to 1,323	Intravenous injection. 1700 c.c. S.T.
March 29th to April 8th	6,800	1,739	April 14th	10·5	225	3,656,250	Fall	3,392,500	Fall	1 to 1,950	1125 c.c. S.T., of which 400 intravenous.
April 26th to 29th	12,500	1,864	May 6th	9·75	150	2,437,500	Fall	4,123,750	Fall	1 to 2,212	Intravenous injection. 600 c.c. S.T.
June 16th to 19th	37,300	2,237	June 23rd	9·6	90	1,462,500	Fall	4,555,750	Fall	1 to 2,036	Intravenous and unsterilised. 800 c.c. S.T.
July 10th to 12th	23,900	2,476	July 17th	4·8	175	2,843,750	1,381,250	4,975,750	1 to 5,779	1 to 2,009	220 c.c. unsterilised S.T.
—	—	2,476	July 24th	8·0	120	1,950,000	Fall	5,455,750	Fall	1 to 2,203	
Aug. 9th to 12th	20,800	2,684	Aug. 19th	8·4	75	1,218,750	Fall	5,770,750	Fall	1 to 2,150	
Aug. 31st to Sept. 2nd	38,000	3,064	Sept. 29th	4·8	70	1,137,500	Fall	5,938,750	Fall	1 to 1,938	20 c.c. prodigiosus.
Sept. 30th to Oct. 15th	62,100	3,685	Oct. 25th	9·6	60	975,000	Fall	6,226,750	Fall	1 to 1,689	1000 c.c. S.T. intravenously + 750 c.c. unster. S.T.
Nov. 9th to 15th	41,000	4,095	Nov. 24th	8·4	60	975,000	—	6,478,750	—	1 to 1,582	750 c.c. unsterilised S.T.
Dec. 1st to 8th	61,400	4,709	Dec. 20th	7·8	50	812,500	Fall	6,673,750	Fall	1 to 1,417	1050 c.c. unsterilised S.T.

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc.

In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood at the next bleeding.

Used as standard antitoxin.

for the purpose of obtaining a standard test antitoxin, and it still remains one of the standards by which the strength of our toxins is measured.

Horse No. 12. "Brown Cob Gelding."—Chart No. 9 and Table CXXII.

A single injection of serum toxin followed by one A.U. in blood.

After this animal had been tested with mallein, it received the first treatment on the 16th of January, 1898, when 450 c.c. of serum toxin was injected: although there was comparatively slight local reaction, the swelling continued from the 17th to the 23rd, and there was a steady rise of temperature for two days, at the end of which period the thermometer registered 105° F. (40·5° C.). The temperature then fell regularly until the 22nd. Nothing further was done to this animal until the 2nd of February, when it was found that the blood contained 1 unit of antitoxin per c.c. On the 7th treatment with D T $N^{0\cdot2}$ was commenced: 20 c.c. gave rise to a comparatively slight reaction; on the 9th 75 c.c., and on the 10th 150 c.c. were given; on the 11th 200 c.c., these being followed by some swelling and a rise of temperature to 103° F, (39·5° C.); on the 12th an injection of 300 c.c. was followed by a very slight rise of temperature, but little or no increase of the swelling. It was found, on bleeding the animal on the 13th. that the serum contained 4 antitoxin units per c.c.; on the 14th and 15th, after 600 c.c. D T $N^{0\cdot2}$ had been injected, on each occasion the temperature rose to 102° F. (39° C.) between these two injections, and there was well-marked local reaction on the 16th, and in three days there had been a rise from 4 antitoxin units per c.c. to 150. Between the 22nd of February and the 27th well-marked local reaction was again obtained, and a similar reaction was obtained from the 28th to the 5th, the temperature once at least during each reaction rising to 102·5° F. (39·2° C.). On the 11th of March the serum had a value of 400 units per c.c.; on the 21st, after another marked reaction, the value was still 400; whilst on the 4th, when there had been no treatment, but the animal in the meantime had been tested with tuberculin, the strength of the serum had fallen to 350 units per c.c. In April, between the 12th and the 21st, the temperature was kept in a somewhat unstable condition by means of three injections of strong toxin (D T $N^{1\cdot4}$), but the local reaction was not continuous, nor was the temperature maintained in a sufficiently oscillating condition; still, the animal, bled on the 25th, gave a serum of 550 antitoxin units per c.c., and since that date the strength of the serum has risen still higher.

Cumulative treatment useful in keeping up a condition of "instability."

Horse No. 13. "White-Faced Mare."—Chart No. 10 and Table CXXIII.

One A.U. in three days.

Here again the serum toxin treatment was used, 1,050 c.c. being given by Dr. Wood in three days; the swelling and temperature being fairly marked throughout this period, and for some little time afterwards. On the third day the serum contained over 1 unit of antitoxin. After a further period of treatment of three days, during which time 1,700 c.c. of the serum toxin was injected, the blood, taken five days after the cessation of treatment, contained 20 antitoxin units. On the 11th and 12th of March 600 and 700 c.c. respectively of serum toxin were injected; and then, on the 17th, 18th, and 19th, 300 c.c., 400 c.c., and 750 c.c. D T $N^{0\cdot2}$ were injected. Blood taken on the 21st was found to contain 125 units per c.c. As will be seen from the chart, the treatment after this date on to the 21st of April was somewhat intermittent, but good local reactions and moderate temperature reactions were obtained after each injection or series of injections. The animal, bled on the 25th, was found to give a serum of 350 units per c.c.; whilst since that date, under a more continuous treatment, a considerably stronger serum has been obtained. It is evident, on the consideration, especially of the later animals of which records are here given, that the production of antitoxin may be commenced at once, and in suitable animals carried on very rapidly; whilst, as pointed out by Wood in his note (see *Lancet*, 1896, Vol. I., p. 982), it is possible at a very early stage of treatment to determine whether an animal possesses the power of giving good antitoxin or not, so that it is unnecessary to waste time and material in injecting animals which even during the first two or three weeks do not react properly or sufficiently actively to serum toxin. If they do not give a fair antitoxin value at a very early period when injected with the serum toxin, they may be put on one side as unlikely to give strong serum, and material and energy may be devoted to other horses. In this way the stable may be kept full of horses of high antitoxin-producing power, and there comes to be great saving both as regards fodder and labour; a few horses which give potent antitoxic serum doing the work of a considerable number which give a much weaker serum. The cost of production—maintenance of horses and stable staff—may thus be very materially diminished when once good horses have been selected. Then, too, from the fact that such potent antitoxic serum may be obtained so rapidly from good horses, there is a further economy, as animals begin to pay for their keep and to be productive almost within a month of coming under treatment. It is, however, a comparatively easy matter, where there are a few spare stalls and a couple of observation boxes, to keep up an almost unlimited supply of potent serum, using the term "potent" as containing a strength of over 250* units per c.c. As bearing on this point, it may be mentioned that, although antitoxin has been sent out to the hospitals under the Board at a rate of from a little more than half a million to over six million units per month during the last two years (1896 and 1897), at no time have there been more than nine horses in the stables, and during most of the time not more than seven. It will be observed that in almost every instance of which a record is here given there has been a very rapid rise of the antitoxic value of the serum up to a certain point, but that, this point being reached, it is a matter of considerable difficulty to maintain the strength for any lengthened period, and that after two bleedings there is a slow but steady fall in the number of units per c.c. Sometimes it is possible, by means of a large and

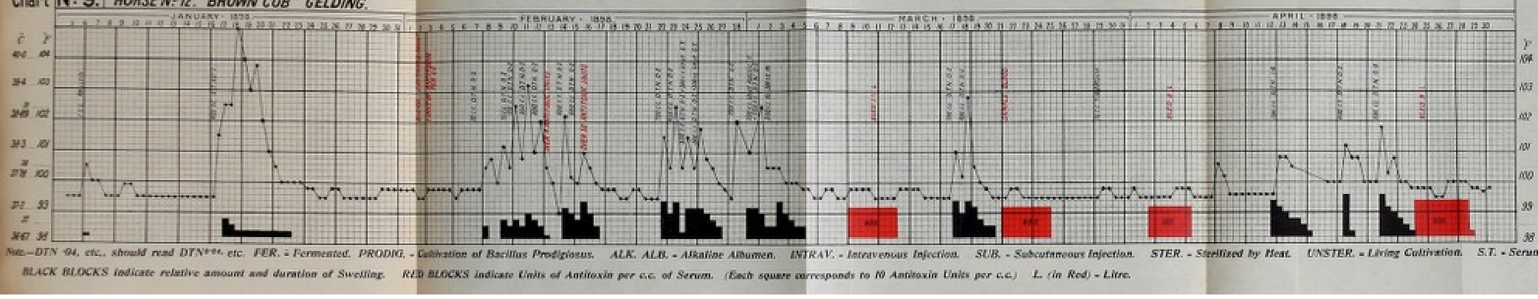
Economic value of serum treatment of horses.

More energetic treatment required to obtain same results in horses long under treatment.

* Since this was written we have been so successful in the production of what the Americans call high-grade serum, that I should now apply the term "potent" only to serums having an antitoxic value of at least 400 units per c.c.

Temperature, Swelling, and Antitoxin Chart of Horse No. 12.

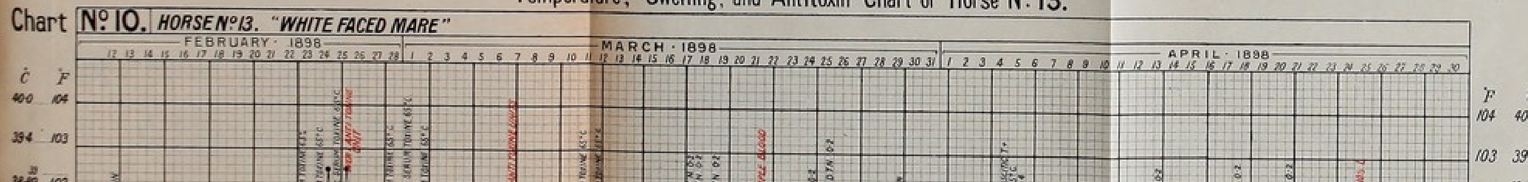
Chart No. 9. HORSE No. 12. "BROWN COB" GELDING.



Note.—DTN ·94, etc., should read DTN·94, etc. FER. = Fermented. PRODIG. = Cultivation of Bacillus Prodigiosus. ALK. ALB. = Alkaline Albumen. INTRAV. = Intravenous Injection. SUB. = Subcutaneous Injection. STER. = Sterilized by Heat. UNSTER. = Living Cultivation. S.T. = Serum Toxin.

BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum. (Each square corresponds to 10 Antitoxin Units per c.c.) L. (in Red) = Litre.

Temperature, Swelling, and Antitoxin Chart of Horse No. 13.



Note.—DTN ·04, etc., should read DTN0·04, etc. FER. - Fermented. PRODIG. - Cultivation of Bacillus Prodigiosus. ALK. ALB. - Alkaline Albumen. INTRAV. - Intravenous Injection. SUB. - Subcutaneous Injection. STER. - Sterilized by Heat. UNSTER. - Living Cultivation. S.T. - Serum Toxin. BLACK BLOCKS indicate relative amount and duration of Swelling. RED BLOCKS indicate Units of Antitoxin per c.c. of Serum. (Each square corresponds to 10 Antitoxin Units per c.c.) L. (in Red) - Litre.

Table CXXII.—Horse No. 12, Brown Cob, weighs 397·7 kilos. Blood—$\frac{1}{13}$ of body weight = 30·5 kilos (litres) = 15·25 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres). Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1898 —	—	—	1898 Feb. 2nd	0·02	1	15,250	15,250	15,250	—	—	Jan. 6th, 1 c.c. Mallein. Jan. 16th, 450 c.c. S.T.
Feb. 7th to 12th	14,900	149	Feb. 13th	0·02	4	61,000	45,750	15,290	1 to 307	1 to 102	
Feb. 14th and 15th	24,000	389	Feb. 16th	0·1	5	76,250	15,250	15,540	1 to 63	1 to 39	
Feb. 22nd to March 2nd	61,500	1,004	March 11th	5·5	400	6,100,000	6,023,750	1,115,540	1 to 9,794	1 to 1,111	500 c.c. unsterilised S.T. D. T. N. 0·1. 550 c.c. unsterilised Ascitic Toxin. D. T. N. 0·1.
March 17th and 18th	22,000	1,224	March 21st	0·25	400	6,100,000	—	1,165,540	—	1 to 951	
—	—	—	April 4th	8·0	350	5,337,500	Fall	2,565,540	Fall	—	March 29th 1½ c.c. tuberculin.
April 12th to 21st	46,000	1,684	April 25th	9·0	550	8,387,500	3,050,000	5,040,540	1 to 6,630	1 to 2,933	

Table CXXIII.—Horse No. 13, White Faced Mare, weighs 499·5 kilos. Blood—$\frac{1}{13}$ of body weight = 38·40 kilos (litres) = 19·20 litres serum.

1898 Feb. 23rd to 25th	—	—	1898 Feb. 25th	0·1	1	19,200	19,200	19,200	—	—	1 c.c. Mallein on Feb. 12th. 1050 c.c. S.T.
Feb. 28th to March 2nd	—	—	March 7th	0·1	20	384,000	364,800	20,200	—	—	1700 c.c. S.T.
March 11th to 19th	29,000	290	March 21st	0·1	125	2,400,000	2,016,000	26,450	1 to 6,952	1 to 91	1300 c.c. S.T.
March 24th to April 21st	77,300	1,063	April 25th	10·5	350	6,720,000	4,320,000	1,863,950	1 to 5,588	1 to 1,753	1½ c.c. tuberculin on Mar. 29th. 170 c.c. S.T. + 330 c.c. unsterilised Ascitic Toxin.

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc.

In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.

steadily increasing number of injections of strong toxin, to prevent a very rapid fall, and in some instances it has been possible to obtain a certain increase after there has been a fall; but it must be admitted that after a certain period the tendency in almost every horse that we have had under treatment has been for the serum to fall off—in some instances, however, much more rapidly than in others. We have now come to recognise this as an unavoidable condition, with the result that we have determined that after the serum of a horse falls to a certain antitoxic value it is wiser to get rid of the animal than to keep him on occupying space and consuming fodder and large quantities of toxins that, applied to other and fresher horses, would give much more satisfactory results. The whole of our experience, therefore, has been in the direction of selecting animals by means of the preliminary injections with serum toxin, and then to get rid of those animals which no longer react readily to toxins and serum toxins, and which no longer produce antitoxin of at least 200 or 250 units per c.c. In some cases we have kept two or three of such animals as reserves and for special work, but as a rule we find it far more economical to get rid of them.

The following horses treated by Wood's serum toxin method afford additional evidence of the advantages of this preliminary method of treatment. Dr. Wood will no doubt take some opportunity of giving a full description of these later animals which were under his care.

TABLE CXXIV. (see also Tables CXXV.–CXXVIII.).

Horse.	Treatment commenced	Strength of antitoxin after treatment for											
		7	9	11	13	15	16	17	20	22	25	29	33 weeks.
No. 14, "Bay Horse"	June 14th, 1898 ...	...	...	150	...	...	295	...	225	225	225	150	200 units per c.c. (sold)
No. 15, "Brown Mare" ...	June 14th, 1898 ...	...	...	150	...	...	...	225	150	...	...	...	
No. 16, "Big Bright Bay"	October 17th, 1898 ...	625	...	325	...	600	500	...	...	...	...	...	...
No. 17, "Chestnut Horse"...	November 23rd, 1898	...	75	...	800	...	...	650	...	...	...	...	...

NOTES ON ANTITOXIN.

Theories as to the source and production of antitoxin.

Since first the questions of the production of immunity and the formation of antitoxin were raised many theories as to the nature of the processes by which these were brought about have been put forward. Without going into any discussion as to the nature of the evidence on which these are founded, it may be stated generally that there can now be little doubt that, although the immunity and antitoxin-producing power may at certain points overlap, they are by no means the same thing, nor are they always developed simultaneously. Indeed, Behring maintains that, during certain periods when the antitoxin-producing power is fairly well marked, there may still be an even increased susceptibility of the animal as a whole to the action of the disease-producing organisms.

Theories as to source bound up with nature of antitoxin.

It is of importance that as many as possible of the theories as to the source of antitoxin should be eliminated, as bound up with this question we have that of the nature of antitoxin; and any evidence that will help in this should be noted.

Antitoxin the result of a special stimulation of certain cells.

One of the original theories put forward by Roux and Vaillard(1), and afterwards emphasised by Ehrlich(2), is that antitoxin is formed as the result of a special stimulation of certain cells, probably the connective tissue cells or cells allied to them, as a result of which there is a special reaction and a secretion or overflow of the products of this reaction. This process, as put forward by Emil Fischer (see also p. 150), Weigert, and Cartwright Wood (*Proc. R. Soc. Edin.*, vol. xvi., 1889), fits in so accurately with the facts at present at our disposal that we may look upon it for the present as a good working basis.

Additional evidence of this.

In support of this I venture to put in evidence the Charts (1 to 10) and Tables (CXI. to CXXIX.) in this Report, from which it will be seen that it is only when there is marked reaction, both local and constitutional, that there is any increase in the amount of antitoxin produced. It will appear, however, from a careful study of these Tables that the constitutional reaction is really of secondary importance, because the toxin injected must exert its greatest stimulating power—in fact one might almost say its only stimulating power—on those tissues with which it comes directly in contact, that is, before it becomes mixed with any large quantity of lymph or finds its way into the circulation, in which at the temperature of the body, the combination of toxin and antitoxin goes on with great rapidity, the amount of antitoxin in the blood of some of the animals being thousands, or even tens of thousands, of times the quantity required to neutralise the whole of the toxin injected. Acting locally, however, one can quite understand how the toxin, given in gradually increasing quantities, can still continue to stimulate the connective tissue cells to the production, excretion, and overflowing of the antitoxin into the surrounding fluids.

Local production of antitoxin.

Number of lethal doses in test dose of toxin.

In the Tables referred to the test dose is calculated at one hundred times the lethal dose. Of course, as has been pointed out by Ehrlich (*Die Werthbemessung*, l. c.), there is no constant proportion between the two. In certain rare cases the test dose is over one hundred times the lethal dose (see also p. 150), but more usually it comes out at about 50 or 33 (average). For convenience of calculation, however, and in order to see whether there was any relation between the amount of toxin and antitoxin, the early theoretical test dose of one hundred times the lethal dose has been adopted. It must, however, be borne in mind that the Tables would bring out the same facts were the test dose only a single lethal dose.

Antitoxin not a modified toxin.

A second theory, which for some little time occupied the attention of those who were working at this subject, was that antitoxin is a modified toxin. Attempts were made to prove that by electrolysing toxin antitoxin was produced. It was soon found, however, that this was not a case of production of antitoxin; the toxin in such cases is actually destroyed by the chloro-hypochlorites

(1) *Annales de l'Institut Pasteur*, 1893, tome vii.
(2) *Die Werthbemessung, &c.*, *Klin. Jahrb.* Bd. vi., 1897.

TABLE CXXV.—Horse No. 14, Bay Horse, weighs 423·1 kilos. Blood—$\frac{1}{13}$ of body weight = 32·5 kilos (litres) = 16·25 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres.) Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1898 May 24th	—	—	1898 —	—	—	—	—	—	—	—	1 c.c. mallein.
May 28th	—	—	—	—	—	—	—	—	—	—	3½ c.c. tuberculin.
June 10th	—	—	—	—	—	—	—	—	—	—	1 c.c. mallein.
June 14th to Aug. 19th	101,000	1,010	Aug. 30th	0·75	150	2,437,500	2,437,500	2,437,500	1 to 2,413	1 to 2,413	3000 c.c. S.T. + 1775 ascitic toxin.
Sept. 14th to 28th	43,000	1,440	Oct. 4th	6·0	295	4,793,750	2,356,250	3,322,500	1 to 5,479	1 to 2,307	
Oct. 4th to 27th	62,000	2,060	Oct. 31st	9·0	225	3,656,250	Fall	4,335,000	Fall	1 to 2,104	
Nov. 4th to 15th	54,000	2,600	Nov. 15th	0·75	225	3,656,250	—	4,419,375	—	1 to 1,699	
Nov. 19th to Dec. 1st	149,000	4,090	Dec. 6th	9·0	225	3,656,250	—	5,431,875	—	1 to 1,328	
Dec. 12th to 30th	129,000	5,380	Jan. 6th, 1899	9·0	150	2,437,500	Fall	6,106,875	Fall	1 to 1,135	
1899 Jan. 14th to 26th	100,000	6,380	1899 Jan. 31st	9·0	200	3,250,000	812,500	7,006,875	1 to 812	1 to 1,098	

TABLE CXXVI.—Horse No. 15, Brown Mare, weighs 474·1 kilos. Blood—$\frac{1}{13}$ of body weight = 36·4 kilos (litres) = 18·2 litres serum.

1898 May 24th	—	—	1898 —	—	—	—	—	—	—	—	1 c.c. mallein.
May 28th	—	—	—	—	—	—	—	—	—	—	3½ c.c. tuberculin.
June 14th to Aug. 22nd	108,500	1,085	Aug. 30th	0·75	150	2,730,000	2,730,000	2,730,000	1 to 2,516	1 to 2,516	2145 c.c. ascitic toxin + 3400 c.c. S.T., of which 700 c.c. intrav.
Sept. 13th to Oct. 8th	84,000	1,925	Oct. 13th	3·75	225	4,095,000	1,365,000	3,039,375	1 to 1,625	1 to 1,578	
Oct. 19th to Oct. 27th	17,000	2,095	Oct. 31st	8·25	150	2,730,000	Fall	3,658,125	Fall	1 to 1,746	Mixture of pneumococcus and diphtheria toxin. 1700 c.c.

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc.
In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.

produced when a weak saline solution is electrolysed, as when no sodium chloride had been added to the solution there was little or no destruction of the toxin. Professor Fraser[1], of Edinburgh, from his observations on snake venom and antivenine, came to the conclusion that in his antivenine he was dealing with a modified venom. He says that the antitoxic or immunising substances originate, not from vital reactions upon the constituents of the body, but from the toxins themselves, being produced by chemical changes in these, or being actually among their normal ingredients.

On looking over the record of the treatment of our horses, I was at once struck by the fact that the amount of antitoxin formed is apparently out of all proportion to the amount of toxin introduced; as I have already stated, it is in some cases thousands of times as great, taking the test dose at its lowest toxic value. Bearing in mind, however, that we have the production of what Ehrlich calls toxoids, it was naturally suggested that these might be transition stages between the toxin and antitoxin. Against this, however, are the following facts: that these toxoids, like the toxins, although they have the power of stimulating the cells to produce antitoxins, appear also to act like toxins in neutralising antitoxins. A further fact is that Wood's serum toxin has so far lost its toxic effect, that three or even five c.c. of this substance produces no appreciable lethal effect when injected into a guinea-pig, or only a temporary swelling which soon passes off. Although serum toxin has the power of producing antitoxin in the tissues, of which we have evidence in several of the tables relating to the later horses, it appears to exert absolutely no antitoxic action; the substance contained must therefore be looked upon as a toxin greatly modified, but not in any way converted into an antitoxin, as it neither materially increases nor diminishes the antitoxic action of a test dose of antitoxin acting upon a test dose of toxin.

Additional evidence of the "secretory" theory of antitoxin.

As early as 1893 Roux and Vaillard[2] pointed out that animals treated with toxin may lose blood equal to the whole of the body-weight, if this be prolonged over a period of several days, without there being any marked falling-off of strength in the antitoxic value of the blood that remains, this affording evidence that the production of antitoxin must be going on as the continued result of a special stimulation of antitoxin-forming cells; the toxin has all disappeared, but antitoxin is still being formed. Salomonsen and Madsen[3] have also recently proved that there may be an actual rise after considerable volumes of blood have been withdrawn from an animal treated with toxin, and they agree with those who maintain that there is a new production of antitoxic substance going on as a result of a special stimulation. My observations, as I have before stated, all go to prove that the antitoxin is in great measure formed locally, that it is the result of a special reaction between the toxin and the subcutaneous and connective tissues, and that the antitoxin is produced as a kind of secretion from these special cells reacting to the special stimulation. To put it into the words of Salomonsen and Madsen (*op. cit.*) certain cells of the organism have acquired a new secretory property which persists over a considerable period.

Antitoxin excreted more or less rapidly in urine, milk, etc.

Numerous experiments have been carried out for the purpose of showing that antitoxin is somewhat rapidly excreted in the various secretions of the body, and some have maintained that it is actually destroyed within the body. Bulloch[4] shows that antitoxin injected into the donkey rapidly passes out in the excretions. Salomonsen and Madsen prove that it is present in the milk of suckling animals that are being treated for the production of antitoxin.

There seems to be some peculiarity about this excretion of antitoxin not yet thoroughly explained. When a prophylactic dose of antitoxin is injected into a child, the protective effect appears to wear off somewhat rapidly. This protection, at first almost perfect, appears to gradually diminish, and at the end of from three to six weeks the susceptibility may be again almost at the normal. In order to determine the rate of fall of the antitoxin contained in a horse that has been under treatment for some time, the accompanying charts may be examined, and it will be seen that in some cases, especially during the earlier stages of the treatment of these animals, the fall is very rapid indeed. In one case the fall was from 325 to 275 units in 31 days; in another from 400 to 150 in 67 days; in another from 1,000 to 700 in 34 days; in another from 180 to 125 in 27 days. These numbers might be greatly multiplied, and a reference to Tables CXI.-CXXIX. will show even more marked falls than these, especially in one case (Table CXXVII.), from 625 to 325 in 30 days, where the treatment had been forced or carried out rapidly. The fall by excretion of antitoxin may go on very rapidly then where the cells have not been properly trained to do their new work without special stimulation. In an animal, however, that has been subjected to a long-continued course of treatment and where, consequently, we should expect that the cells have become specially accustomed to the regular production of antitoxin, we should expect to find, in spite of the rapid excretion, and in spite of the failure to apply the special

Antitoxic value of serum kept up in spite of great amount of antitoxin excreted, when animals have been kept under treatment for some time.

stimulation, that the production of antitoxin would still go on to such an extent as to throw a considerable quantity into the blood, and so maintain a considerable antitoxic value of that blood. We have the following evidence on this point:—The treatment of the Brown Pony (Horse No. 2., Table CXII.) was discontinued on April 25th, 1898, when the antitoxic strength of the serum was 300 units. On the 30th August the antitoxic value of the serum had fallen to 175; it then fell gradually until the 4th of October, when its antitoxic value was 135. It remained very close to this strength until November 5th, and even on the 12th January, 1899, it was still above 100. So that if the excretion of antitoxin goes on equally in the various animals there must have been in this animal a continued reproduction of antitoxin in spite of the fact that there is no longer any specific stimulation of the tissues. There was certainly no toxin being thrown into the animal from which antitoxin could be formed. That being the case, the only conceivable source is the cells that have become accustomed to secrete antitoxin, this function persisting even after the removal of the stimulation.

(1) An address to the Royal Institution (*Nature*, 1896, vol. liii., p. 571), also *Brit. Med. Journ.*, 1896, vol. i., p. 957.
(2) *Annales de l'Institut Pasteur*, 1893, tome vii., p. 82.
(3) *Annales de l'Institut Pasteur*, tome xii., p. 762.
(4) *Journal of Pathology*, vol. x. (1898), p. 244.

TABLE CXXVII.—Horse No. 16, Big Bright Bay, weighs 522 kilos. Blood—$\frac{1}{13}$ of body weight = 40·1 kilos (litres) = 20·05 litres serum.

Date of Treatment.	Lethal doses of Toxin. Test dose = 100 lethal doses.	Total test doses from commencement of Treatment.	Date of bleeding.	Amount of blood withdrawn (in litres). Serum calculated at half this Amount.	Antitoxic value of serum = units per c.c.	Number of units in whole blood at time of bleeding.	Rise in number of units since last bleeding.	Total units accounted for since commencement of Treatment.	Proportion of test doses of Toxin to rise in number of units since last bleeding.	Proportion of whole number of test doses of Toxin to total units of antitoxin, accounted for from commencement of Treatment.	
1898 July 4th	—	—	1898 —	—	—	—	—	—	—	—	1 c.c. mallein.
July 11th	—	—	—	—	—	—	—	—	—	—	3½ c.c. tuberculin.
Oct. 13th	—	—	—	—	—	—	—	—	—	—	3½ c.c. tuberculin.
Oct. 17th to 30th	—	—	Dec. 5th	7·5	625	12,531,250	12,531,250	12,531,250	—	—	6950 c.c. S.T.
Dec. 12th to 28th	—	—	Jan. 4th, 1899	9·0	325	6,516,250	Fall	13,993,750	—	—	2550 c.c. S.T.
1899			1899								
Jan. 12th to 26th	144,000	1,440	Jan. 31st	8·5	600	12,030,000	5,513,750	16,543,750	1 to 3,829	1 to 11,488	
Feb. 11th to 22nd	227,400	3,714	March 3rd	9·0	500	10,025,000	Fall	18,793,750	Fall	1 to 5,060	

TABLE CXXVIII.—Horse No. 17, Chestnut Horse, weighs 494 kilos. Blood—$\frac{1}{13}$ of body weight = 38·0 kilos (litres) = 19·0 litres serum.

1898			1898								
Oct. 13th	—	—	—	—	—	—	—	—	—	—	3½ c.c. tuberculin. 1 c.c. mallein.
Nov. 23rd to Dec. 30th	—	—	Jan. 4th, 1899	9·0	75	1,425,000	1,425,000	1,425,000	—	—	5100 c.c. S.T.
1899			1899								
Jan. 12th to 26th	123,000	1,230	Jan. 31st	9·0	800	15,200,000	13,775,000	5,025,000	1 to 11,199	1 to 4,085	
Feb. 11th to 25th	144,100	2,671	March 3rd	9·0	650	12,350,000	Fall	7,950,000	Fall	1 to 2,908	

No account is taken of loss of A.T. by excretion, tissue destruction, neutralisation by Toxin, etc.

In rise of strength no account is taken of the units withdrawn at each bleeding as diminishing the antitoxic value of the blood for the next bleeding.

TABLE CXXIX.—SUMMARY OF RESULTS SET FORTH IN TABLES CXI.–CXXVIII. (INCLUSIVE).

Number of Horse.	Duration of first period of Treatment with Toxin, in days.	Number of test doses given during this period. Test dose = 100 lethal doses.	Proportion of Toxin to antitoxin for this period.	Greatest rise of antitoxin between any two bleedings. In A.T. units.	Proportion of Toxin to antitoxin for this period.	Test doses of Toxin given throughout whole period of Treatment.	Proportion of Toxin to antitoxin throughout whole period of Treatment.	Smallest ratio of Toxin to antitoxin during any single period of Treatment.	HIGHEST POINT REACHED.			
									Days.	Test doses of Toxin.	Units of antitoxin per c.c.	Ratio between Toxin and antitoxin up to this point.
1	135	50	1 to 8,000	1,300,000	1 to 7,386	1,359·5	1 to 3,490	1 to 1,408	429	562	140	1 to 3,800
2	239	67·5	1 to 6,511	3,662,500	1 to 40,581	6,911	1 to 4,487	1 to 311	433	427	400	1 to 9,440
3	180	96	1 to 1,790	1,116,700	1 to 3,500	1,337	1 to 1,489	1 to 1,790	431	715	100	1 to 1,601
4	164	51	1 to 11,372	870,000	1 to 4,328	1,023	1 to 4,450	1 to 2,819	355	666	170	1 to 4,854
5	201	58	1 to 16,138	14,040,000	1 to 50,686	7,468	1 to 8,691	1 to 857	306	571	1,000	1 to 14,307
6	48	46	1 to 3,913	1,350,000	1 to 5,578	1,259	1 to 2,662	—	263	804	150	1 to 2,119
7	187	313	1 to 4,811	1,390,000	1 to 1,282	645	1 to 3,724	1 to 1,282	248	617	80	1 to 3,166
8	56	128	1 to 31,250	5,000,000	1 to 2,202	1,677	1 to 8,178	1 to 2,202	148	481	500	1 to 14,708
9	28	73	1 to 22,774	1,662,500	1 to 22,774	781	1 to 3,780	1 to 752	57	203	180	1 to 7,703
10	21	200	1 to 2,500	5,500,000	1 to 25,229	6,046	1 to 4,419	1 to 739	41	1,095	525	1 to 2,556
11	14	12	1 to 13,541	2,500,000	1 to 8,064	4,709	1 to 1,417	1 to 2,976	41	1,290	400	1 to 1,387
12	5	149	1 to 307	6,023,750	1 to 9,794	1,684	1 to 2,933	1 to 63	23	1,004	400	1 to 1,111
13	24	290	1 to 6,952	4,320,000	1 to 5,588	1,063	1 to 1,753	1 to 5,588	57	1,063	350	1 to 1,753
14	77	1,010	1 to 2,413	2,356,250	1 to 5,479	6,380	1 to 1,098	1 to 812	110	1,440	295	1 to 2,307
15	77	1,085	1 to 2,516	1,365,000	1 to 1,625	2,095	1 to 1,746	1 to 1,625	121	1,925	225	1 to 1,578
16	106	1,440	1 to 3,829	5,513,750	1 to 3,829	3,714	1 to 5,060	—	49	No Toxin given	625	—
17	69	1,230	1 to 11,199	13,775,000	1 to 11,199	2,671	1 to 2,908	—	69	1,230	800	1 to 4,085

THE PRINCIPLES AND METHOD OF TESTING THE POTENCY OF ANTI-DIPHTHERIAL, OR DIPHTHERIAL ANTITOXIC, SERUM.

At the very outset, when the question of the determination of the amount of antitoxin or the measurement of the activity of the specific antitoxic action in any given anti-diphtherial serum was approached, it was evident that very serious differences of opinion existed, first, as to the possibility of obtaining any accurate determination, and, second, as to the best method to be adopted for such determination. Initial difficulties.

One of the great difficulties that presented itself was that even for some time after antitoxic serum had been prepared in considerable quantities, and fairly definite information had been obtained as to the effects produced on the course of even severe cases of diphtheria, there were very different opinions held by those who presumably were best informed on the subject as to the mode of action of antitoxin on patients suffering from diphtheria. By some it was maintained that this substance exerted a beneficial effect on the course of the disease through the possession of a power of destroying the diphtheria bacillus itself; by others it was held that this effect was produced through a specific action which the antitoxin was capable of bringing to bear on the cells of the tissues of the body by means of which they are enabled to withstand the invasion of the bacilli and to carry on their special work, even in the presence of large amounts of the toxic products of these bacilli; whilst others, again, held that the value of antitoxin as a remedy was owing to its possession of a power of actually "neutralising" the toxic products of the diphtheria bacillus as they are absorbed from the local manufactory—the throat—into the lymphatics and blood-vessels of the patient. Bactericidal theory.

Behring and Ehrlich, the chief adherents and exponents of this latter theory, claimed at a very early stage of the controversy raised on this question that the action of antitoxin upon toxin, whether in the case of diphtheria or tetanus, is in many respects comparable to the neutralising action exerted by an acid upon an alkali—a comparison, however, that does not appear to hold good throughout, except in so far as it relates to such substances as double salts, phosphates and carbonates of lime, &c. Chemical theory.

Upon this latter supposition Behring based his early method of testing the strength of the antitoxin that he had been able to prepare, although he, at the same time, seems to have had in his mind the possibility that antitoxin might also exert some kind of germicidal influence on the diphtheria bacilli themselves, for we find that in one of his early methods of testing he injected a definite quantity of a living diphtheria culture (a 48 hours' culture 10 times the 24-hour lethal dose for a guinea-pig of 500 grammes weight), having previously injected a certain quantity, say the 1-100th part of a cubic centimetre, of the serum to be tested. Such a serum, if the animal remained alive, was said to possess a strength of 50,000, because 1 c.c. (= 1 gramme) would protect 50,000 grammes weight of guinea-pig: *i.e.*, 1-100th c.c. protects 500 grammes guinea-pig; therefore 1 c.c. would protect 50,000 grammes. If 1-200th c.c. protected 500 grammes guinea-pig, the strength was put down as 100,000; and so on. Behring's early method.

After a time Behring appears to have become dissatisfied with this method, as the results obtained on different animals, throughout a long series of experiments, appeared to be by no means constant. This method is, however, still used, especially in France; though, as recently pointed out by Madsen, the results obtained with the same serum may vary as much as 50 per cent. In the first experiments carried out with the object of testing our serum, this method was compared with that later devised by Ehrlich in conjunction with Behring, and ultimately we came to the conclusion that the newer method was for many reasons vastly superior to Behring's original method. Later method of testing.

One of the objections to the earlier method was that with living bacilli it was impossible to determine with any degree of accuracy the effect produced on an animal by any measured quantity; for although the quantity might be measured as regards actual bulk, it was by no means a fixed quantity, the number of organisms contained in it varying according to the rate of growth of the culture—a rate very much modified by even minute variations in the composition of the bouillon—the vigour of the culture, and the like,—with the result that the organisms differ very materially in their power, first, of growing, and, second, of forming toxins after they had been introduced into the tissues. Then, too, it soon became evident that the power of neutralising the action of the diphtheria bacilli was, after all, not the special point to be aimed at, as, especially in the early stages of the disease, the bacillus does not necessarily get into the circulation; whilst, on the other hand, toxins are invariably absorbed, sometimes in large quantities, from the seat of the local mischief, even when the bacilli remain strictly localised. If a definite quantity of toxin be added to an exact neutralising dose of antitoxin in a test tube and injected subcutaneously into a guinea-pig, the animal shows absolutely no symptoms of toxin poisoning; if there be an excess of toxin equal to a single lethal dose, the animal dies; and if an excess of slightly less than a lethal dose, it may have severe toxic symptoms, but does not die.

Further, we find that the bulk of the antitoxin introduced into the body of an animal appears to remain there for some considerable time, though a process of excretion commences at once and goes on slowly for probably a month or six weeks. What remains in the body, however, is always ready to combine with any toxin that may be injected or absorbed, so that given a certain quantity of antitoxin in the tissues and fluids of an animal and the animal is in a position to resist the effects of the introduction of a certain quantity of toxin. As soon, however, as all the antitoxin in the body is used up to combine with the toxin, and an excess to the extent of a single lethal dose of toxin still remains, the animal must succumb; whilst, if less than a full lethal dose remains unneutralised, evidence of the presence is afforded in the fact that the animal suffers from local swelling, loss of weight, and perhaps paralysis, impaired cardiac action due to the occurrence of Antitoxin remains in body for some time.

degenerative changes in the peripheral nerves and in the heart muscle. In some cases symptoms due to the impairment of functions of such structures as the epithelium of the kidney, the liver cells, and the vascular and lymphatic endothelium, were also traced.

The toxins are not stable and constant.

Behring's original method, based on the fact that diphtheria toxin is of more or less constant quality, was soon re-introduced. Here a single lethal dose of toxin, from which the diphtheria bacilli had been separated by means of filtration through a Pasteur-Chamberland filter, was used, the lethal dose being reckoned as the quantity that would, without fail, kill a guinea-pig of 500 grammes weight. This dose was injected subcutaneously, and a quantity of antitoxin sufficient to neutralise this dose was given 12 hours later; the strength of the antitoxin was calculated on the basis of the quantity of antitoxin required to neutralise the lethal dose of toxin. The method as revived was, however, modified in so far that the toxin and antitoxin were mixed in a test tube before they were injected. It was evident to us that the use of this method is accompanied by a very grave objection. The *lethal* action of the toxin is of course neutralised by a very small proportion of the antitoxin used: thus, if it requires 10-10ths—*i.e.*, one lethal dose—to kill the animal, 8-10ths, or even 9-10ths, would be insufficient to produce the same effect; so that it is only necessary to neutralise 1 or 2 10ths of certain toxins in order to enable the animal to pull through alive, although it may suffer more or less severely from diphtheria poisoning, losing weight, and exhibiting a more or less marked local lesion. This method is all the more unreliable because it was found that toxins having a certain lethal action varied very greatly, (*a*) in their power of producing swelling, (*b*) in their effect on the reduction of the weight of the animal, and (*c*) in their power of causing paralysis.

Theory of multiple doses.

In order to mimimise these drawbacks, Ehrlich and Behring, in place of using a single lethal dose, devised a method in which, having determined by direct experiment the exact lethal dose of a certain toxin, they then took 10 times this lethal quantity, and by titration and animal experiments determined the exact amount of the antitoxin they were testing that it was necessary to inject subcutaneously along with this large dose of toxin (the two having previously been thoroughly mixed in a test tube) in order to exactly neutralise not only the lethal action of the toxin, but also any local action, so that when the animal was examined four days later not a trace of swelling—beyond that set up by the reaction along the track of the needle, and which might be due to the slight injury to the tissues by the passage of the needle—remained. It is evident that the margin of error even as regards the lethal action of the toxin must here be greatly diminished, as if there were 10 doses of toxin present, at least a fraction more than nine of them must have been neutralised before the animal could remain alive, whilst the presence or absence of swelling would further reduce the possible 8 or 9 per cent. margin of error.

This method of testing was obviously so much better than the earlier method, that it was at once adopted.

Modification of Diphtheria Toxin.

As the result of a series of observations on toxins that had been kept in a warm chamber, and even at the ordinary temperature for some time, I was convinced that diphtheria toxin became modified. Ehrlich in his paper(1) showed that under these conditions ordinary toxin loses its toxic activity,(2) but still retains its power of combining with diphtheria antitoxin. These modified toxins, which still retain the specific power of combination, Ehrlich names "toxoids," and he explains the fact that different crude diphtheria toxins have very different relative lethal activities and combining powers, to the transformation of the lethal toxins into comparatively non-lethal toxoids. A most interesting observation on this point was made with a toxin of which the neutralising strength was 0·31—as near as possible 100 toxin doses of the absolute toxicity for a guinea-pig of 250 grammes—0·003; nine months later the amount required for a single lethal dose had risen exactly three times, being now 0·009, but the power of entering into combination remained exactly the same, 0·31 still neutralising an antitoxin unit, the L_0 value and the L_+ value remaining absolutely the same, so that these toxoids, although they have lost their lethal activity, have still retained their exact power of neutralisation throughout. All this points to the fact that in the rearrangement of the atoms in the molecule the combining bonds still remain the same, but the special characteristic of the toxin is so far altered by the rearrangement that it no longer has the power of acting upon the protoplasm, to the same extent, at any rate, as it had previously. This opens up a very interesting question in connection with the production of immunity, as it is evident that the possibility of the stimulation of the lateral chains and the production of antitoxin by bodies which do not retain their full toxic action would render the possibility of protecting animals a much safer one than where it is necessary to use active toxins for this purpose. Cartwright Wood's experiments with the albumoses produced by the diphtheria bacillus (received by Royal Society February 20th, 1896, published in *Lancet* April 11th), of course have a most important bearing on this question. His serum toxin, which, although it had to a great extent lost its toxic power—*i.e.*, the enzyme molecule has been destroyed by heat—still retains its power not only of conferring an immunity upon the animal organism, but actually of stimulating its cells to the production of very considerable quantities of free antitoxin. At first I thought that these albumoses of Martin's should retain the power of neutralising antitoxin. On that special point I have as yet no evidence, but I find that *serum toxin exerts little, if any, such effect*. In consequence of the changes above noted it was found necessary to reproduce the standard from time to time as the toxin failed in strength, or a fresh quantity had to be prepared. Here, had the standard been lost, the difficulty was added to and rendered more complicated by the fact, as already pointed out, that the relation of lethal activity to local action varied enormously in different samples of toxins.

Toxoid

Diphtheria albumoses.

Difficulty of preserving standard.

(1) *Loc. cit.* See also *Cobbett, Journal of Pathology and Bacteriology*, 1896, vol. iii., p. 327.

Further, from published accounts it was gathered that the original standard used by Behring was not obtained by taking an exact multiple of 10 lethal doses. He describes his normal toxin as of such strength that 0·3 c.c. kills 1 kilogramme of guinea-pig, whilst the dose that he takes of this toxin is 0·8 c.c. As he used animals weighing about 250 grammes, the test dose, if corresponding to 10 lethal doses, should have been 0·75. It is probable, therefore, either that some factor is not mentioned, or, a more or less arbitrary standard having been carefully worked out on this figure, he looked upon it as being sufficiently accurate for all practical purposes. He states, indeed, that this test dose must, after all, be looked upon as an arbitrary standard, although in the first instance the result obtained was based on experiment and calculation. Animal experiments with diphtheria toxin, however, are open to such variations that it would become an exceedingly difficult matter to reproduce exactly the standard were it once lost, and anyone who has attempted to determine the exact lethal action of a diphtheria toxin will at once see that it would be almost an impossibility to reproduce any given standard simply by animal experiments. This will be the more readily understood when Ehrlich's statement that he has sometimes to use a hundred animals before he can determine the exact lethal dose of a toxin is borne in mind.

Standard purely arbitrary.

The standard being arbitrary, then, and the toxin being to a certain extent unstable, it was at one time impossible to reproduce a toxin of precisely similar strength as the original by any process of titration. It would, of course, be possible to titrate against the toxin of diminished strength, but by no process of titration and calculation could the original standard be arrived at. Behring, working on this basis in connection with the tetanus toxin and antitoxin, finding that the antitoxin was far more stable than the toxin, prepared an antitoxin which he could use as a more stable standard—one against which he could titrate the less stable toxin. He made his antitoxin of such strength that a certain quantity would exactly neutralise one lethal dose of tetanus toxin injected into a mouse, and having obtained such a standard he could always, by means of animal experiments, obtain the strength of any toxin, and then, by dilution, again obtain a standard toxin for use in testing antitoxins of unknown strength. Having a standard antitoxin solution, he was able to obtain a standard toxin; from this a fresh standard antitoxin; and so on. The standard antitoxin, however, once obtained, was carefully preserved from the action of air, light, and heat, and was termed a "normal antitoxin."

Diphtheria toxin more stable than tetanus toxin.

Although the toxin of diphtheria is more stable than that of tetanus, it is still, as I have already stated, a somewhat variable and varying quantity, even when kept in bulk; here also, then, it is necessary to preserve a standard antitoxin. Having fixed the normal toxin, Ehrlich and Behring took a quantity of this sufficient to kill ten 250-gramme guinea-pigs; as it happened in this case, they then added just sufficient antitoxin to neutralise this quantity of toxin, injecting the mixture into one guinea-pig of the same size. The exact point of neutralisation was taken as that at which there was no swelling produced, or this swelling was merely temporary and had passed off before the end of the fourth day. The animal, under these conditions, does not fall in weight but continues to feed well, and may even gain in weight. The figure representing the amount of serum required to neutralise these 10 lethal doses was multiplied by 10, the product representing a unit of antitoxin; normal antitoxic serum corresponding to the normal anti-tetanus serum is of such strength that 1 c.c. contains one unit of antitoxin, and should, therefore, neutralise 100 theoretical lethal doses of toxin.

Evidence of neutralisation of toxin.

Newer methods of standardising more accurate and more convenient.

This method of estimating the strength of antitoxin appeared to promise much more accurate results than the method adopted by Roux. When, however, this work was commenced, a careful study of the literature available revealed the fact that there was no exact statement published as to the method adopted for the determination of the lethal dose; the various forms of acute and chronic diphtheria poisoning were mentioned, but little indication was given as to the exact period at which the lethal dose was to act, and it was at once found that there existed enormous differences between the dose necessary to kill in from 24 to 30 hours and the dose that kills only in a week or ten days, or even longer. It was found, however, that much more constant results were obtained when doses sufficient to kill the animal in 48 hours were used than in the case of the more chronic forms of poisoning, and in all our earlier experiments the lethal dose was taken as that quantity that was sufficient to kill a 200-gramme guinea-pig in 48 hours. I was afterwards informed by Professor Ehrlich that he calculated the lethal dose as the quantity of toxin necessary to kill a 250-gramme guinea-pig on the fourth day after the injection; and on comparing the lethal dose used in these laboratories with that used by Professor Ehrlich, it was calculated that here the standard had been pitched at from 25 to 30 per cent. too high—*i.e.*, above that which had been worked out in Germany. The result of all this (along with the fact that before we had acquired full confidence in our method we thought it essential to err, if at all, on the side of safety) was that the earlier serums down to No. 28 contained a greater number of normal antitoxin units than were originally calculated; so that the earlier serums up to this number were really stronger than they were said to be.

Early testings erred on safe side.

Lethal activity of toxin to be neutralised.

In diphtheria it is the lethal action of the poison that must be neutralised, and therefore in testing the activity of antitoxic serum it is its power of neutralising this lethal activity that must be determined as accurately as possible. The local reaction, although giving approximately accurate results, is not to be relied upon as giving the absolute lethal activity of a toxin, and therefore this local action should be as far as possible left out of account in testing antitoxin. This fact, I think, is even more important than the difficulty mentioned by Ehrlich that where a purely subjective method of determining the line at which the swelling ceases has to be taken into account, the personal factor in the equation has to be reckoned with, and therefore, according to the individual using the method, differences may occur; for this reason it is absolutely necessary, by the original method of testing, for each experimenter to test his own personal element and determine his own normal abscissa. I had already decided that it was necessary to bring the lethal factor into greater prominence in testing antitoxin when Ehrlich published his now famous paper, and I recognised that he had made a distinct step forward when he returned to the time of death as the determining factor in judging of the activity of a test toxin, and consequently of the activity or neutralising power of an antitoxin.

As the result of the examination of a series of different toxins prepared by different methods, preserved under different conditions, and kept for varying periods, Ehrlich found that it was necessary first of all to determine the absolute toxicity of a toxin, though he afterwards determined the relation of the swelling-producing powers to this toxicity, for the purpose of analysing the toxins.

Determination of absolute toxicity.

In order to determine the absolute toxicity of a toxin, Ehrlich, as above noted, took the death period as four days from the time of injection. He pointed out that, although quantities of a toxin sufficient to kill animals on this fourth day might, in the case of susceptible animals, exert its lethal action in from 36–48 hours, a certain proportion of the animals would always survive to the fourth day; but, if the dose was strong enough, no animal should live beyond that period, or at any rate beyond the fifth day. Theoretically, 100 times this dose injected along with one unit of antitoxin should not kill the animal before the fourth day, on which day, however, the animal might die, whilst it certainly should not live beyond the fifth or sixth day. It was found, however, as has already been pointed out, that, as a matter of experiment, this multiple of 100 + the unit of antitoxin did not give these definite results. Having arrived at this conclusion, and having a standard antitoxin at command, Ehrlich determined accurately two neutralisation points—first, the amount of toxin which one antitoxin unit exactly neutralises: *i.e.*, the effect is such that not only does the animal not die, but no swelling is developed; there is little, if any, loss of weight, and no other ill effect is produced on injection of the mixture. This first neutralisation point Ehrlich denotes by L_0—*i.e.*, there is nothing left to be neutralised. The second neutralisation point is that at which the quantity of toxin present is sufficient to neutralise the whole of the antitoxin, a sufficient quantity of the toxin to kill the animal on the fourth day remaining uncombined. This point is spoken of as L_+. Theoretically, the difference between L_0 and L_+ should correspond to exactly one lethal dose of toxin sufficient to kill a guinea-pig of 250 grammes in four days, and L_0 and L_+ should be 100 and 101 multiples of the single dose respectively, as in the first case we have complete neutralisation, in the second an excess of toxin sufficient to kill the animal in the same time that a single lethal dose would bring about the same result. This, however, by no means holds good in actual practice. I may illustrate this by the results obtained by Prof. Ehrlich with toxin supplied from these laboratories. The lethal dose of this toxin to a guinea-pig of 250 grammes was 0·027. Theoretically, 2·7 should be exactly neutralised by one unit of antitoxin; but we find that when this is tested by the standard antitoxin unit, 2·6 is the point at which complete neutralisation takes place—that is, the error in this case is 4 per cent. If the toxin were a pure toxin, with nothing but substances which would bring about the death of the animal, the addition of 0·027 to the neutral mixture should be sufficient to kill the animal in four days, but we find as a matter of fact that in order to kill the animal in four days it is necessary to add 0·45—that is, it is necessary to give 3·05 of this toxin, or a quantity corresponding to 113 calculated lethal doses, in order to kill the animal—so that between the two points there is a calculated difference of 17 single experimentally determined lethal doses instead of one. From this, and from a series of 12 toxins, every one of which gave different results, Ehrlich found that the value L_0, which theoretically should be equal to 100 single lethal doses, contained in the toxin so investigated from only 27 to 109 single lethal doses, whilst the difference between L_0 and L_+—which, as we have seen, should correspond to one lethal dose—varied from 1·7 (a very close approximation to the theoretical figure) to 28 (a very wide deviation).

Two neutralisation points.

Reaction between toxin and antitoxin.

In explanation of these facts, Erhlich advances the theory that there is a definite chemical action and reaction between toxin and antitoxin. He brings forward in proof of this the facts that neutralisation goes on more quickly in concentrated solutions than when they are diluted; that heat accelerates the process of combination, and that cold retards it; and he points out that these are just the conditions under which ordinary chemical double salts are formed. He was thus led to look upon the neutralisation of toxins by antitoxins as resulting in a double salt formation; and, "as multiples of the two under the same conditions lead to multiple neutralisation in exact proportions to the quantity used," he lays down the rule that "one equivalent of the toxin will always neutralise an equivalent of the anti-substances, and that multiples of one of these will also neutralise similar multiples of the other." Arguing from analogy, therefore, it is assumed that a molecule of toxin binds a definite and constant quantity of the anti-substances, and, moreover, that they have a special affinity one for the other, or, as he puts it, "a specific atomic group of the toxic complex having a maximal specific affinity for a definite atomic group of the antitoxin complex, these readily splicing into each other like key and lock," as suggested by Emil Fischer.

A chemical double decomposition.

Production of antitoxin.

Ehrlich maintains, further, that small quantities of tetanus toxin are actually selected by the motor ganglion cells of the central nervous system from the fluids in which this toxin is conveyed throughout the body; it is firmly held by these cells, which, with their selective power, act much as do the anti-substances. Every functioning cell is supposed to consist primarily of a nucleus, associated with which we have the main function of the vitality of the cell; in addition to this, however, there are associated what are called lateral chains, with subsidiary or special functions. These lateral chains have specific combining powers, one of them, at any rate, having a special affinity for the tetanus poison; which poison is, as it were, grasped and "anchored" so that the living protoplasm is brought under the continued influence of the attached tetanus poison, "which brings about a slowly advancing, but long continuing functional disturbance, so long as the union of the lateral chain and the toxin continues," and as this usually remains permanent "we have an explanation of the formation of the anti-substances." The function of the lateral

Lateral chains.

chains holding the toxin molecule is something quite outside the ordinary normal cell activity. As fresh toxin molecules are presented in the cell there is induced in it (the cell) a greater and greater power of combining with the toxin, this power assuming a specific character according as the toxin molecule presented be that of diphtheria, tetanus, snake-venom, abrin, ricin, or the like; and this special function gradually becomes more and more developed in the cell itself, and as new doses of the poison are introduced new combining groups are formed to take the place of those already used up. These again combine with the poison, and the cell is stimulated into special and specific activity in connection with their formation; so that, as more poison is introduced, we have a further formation of the lateral chains, which also have the specific power of combining with the specific toxin. There is, in fact, a special impress, as it were, made on the functions of the cells, which become trained to produce these lateral chains to a greater and greater extent beyond the immediate requirements of the case: the cell, in fact, begins to make provision, not only for dealing with the toxin with which it actually comes in contact, but for larger proportions of toxins with which it *may* have to deal. It may be said to become trained to do work more than sufficient for the moment, and in time this special function is developed to such a point, or, as Ehrlich says, "the overplus of lateral chains is produced to such an extent that they"—the lateral chains or special functions—"can no longer be retained in the cell, but are thrown off into the blood unused, but ready to come into operation whenever they come into contact with the specific molecules with which they have an affinity." Ehrlich points out that "according to this view the anti-substances represent the lateral chains of the cell protoplasm produced in excess of the capacity of the cell to hold it, and they are, therefore, cast off into the fluid constituents of the blood; and as soon as these lateral chains have escaped from the cell, they appear to have a greater power of combining with a specific toxin than they had within the cell, as the whole of their combining branches are, as it were, free to unite with the special molecule for which they have an affinity." Professor Dönitz, moreover, has demonstrated that it is actually possible by means of antitoxins to withdraw toxins combined with the ganglion nerve cells, even after they have been fixed in the protoplasm of the cell for twenty hours, this indicating that the separated anti-substances have a greater affinity for the toxins than have the anti-substances still contained in the protoplasm of the cells.

The latent period of action of the diphtheria toxin, and theory of antitoxin formation.

This theory certainly affords a most beautiful working hypothesis, and suggests an explanation of the fact that improvement may take place even beyond that which can be attributed to the neutralisation of the toxic substances that are circulating in the fluids of the body. It is certainly a most interesting fact, as Ehrlich points out, that even large doses of toxins—with the exception, perhaps, of snake-venom, which acts more rapidly—require a considerable period in which to exert their toxic activity. Unlike crystallised toxins, poisonous alkaloids, the vegetable glucosides, and other substances of which we know the chemical composition and formula, these toxins always require a certain time in which to develop their toxic activity. He suggests that this indicates that the toxin must be forming definite molecular combinations with the protoplasm of the cell or its lateral chains, and that, once entered into this combination, the toxin acquires the power of doing one of two things—of (1) gradually paralysing the cell or of interfering with its main function, or of (2) so stimulating the special function that, in place of succumbing, the cells gradually acquire the faculty of combining with and rendering harmless larger and larger quantities of toxin. In the one case we have death of the cells and of the animal; in the other we have the production of antitoxic substances. In the case of certain poisons that have a definite and recognised chemical composition, especially those of a crystalline nature, the cells have no free bonds, or groups of open molecular affinities, for their reception and fixation; the poisonous action is never counteracted, and no antitoxin is ever produced. Further, Ehrlich maintains, however, that if the special cells of an animal or organ do not possess lateral chains that will unite with the specific proteid or enzyme toxin molecule, the toxin does not prove fatal to these cells, and no antitoxin is ever produced. The bearing of this on the production of antitoxin by susceptible animals, and the failure to reproduce it in animals which are immune to the action of certain of these specific organic poisons, is a matter of extreme interest, and one that has a most important bearing on the nature of the processes that are necessary to be used in the production of antitoxin.

Relative values of test toxins.

In connection with the fact that test toxins vary enormously in their relative lethal and local activities, Ehrlich insists that if these test solutions contain only the lethal toxin in addition to indifferent matter the values L_0 and L_+—that is, the point of exact neutralisation and the point at which death takes place on the fourth day—should be very near one another; there should, in fact, be only a single lethal dose, or 1 per cent., of difference between them, so that L_0 should equal 99, and L_+ 100, and D (difference) should equal 1. Of 11 toxins examined by Ehrlich only one gave D as approximately equal to one single toxin dose, the others gave from 5 to 53 times the single lethal dose as the value of D. It is evident that any diphtheria toxin which gives these high values for D must contain a large proportion of substances which have the power of entering into combination with the anti-substances, but have not the power of killing the animal; and the greater the quantity of such substances that have to be neutralised by the anti-bodies before the neutralisation is complete, the greater will be the value of D, the relations between L_0 and L_+ being markedly disturbed by these non-lethal combining substances. At first Ehrlich was inclined to believe that these "toxoids" could be classified according to their power of combining with antitoxin in relation to the power of the toxin of doing the same, and he divided them into three groups—protoxoids, those that have a greater affinity for antitoxin than has toxin; syntoxoids, those which have an equal value with the toxins in their power of entering into combination; and epitoxoids, those in which the combining value is less than that of toxin. He compared these various toxoids to acids of various combining strengths acting upon an alkali in a purely chemical process, and he gives as an example hydrochloric acid and acetic acid acting on an alkali,

Neutralising values of different toxoids.

which may be compared to protoxoid and toxin acting upon antitoxin. In the chemical combination the hydrochloric acid is first combined, and until that has occurred no acetate is formed, but as soon as the hydrochloric acid has entered into combination then the weaker acid begins to play its part. So, too, if there were only what Ehrlich calls protoxoids and toxin in a solution, the protoxoid would first become neutralised, and until this had taken place no toxin would be allowed to combine with the antitoxin; it is only when there is sufficient antitoxin to combine with the whole of the protoxoid and an excess is left that the toxin can be neutralised, and it is possible to imagine that under these conditions a single lethal dose of toxin combined with 99 of protoxoid would exactly neutralise a unit of antitoxin. In that case the single lethal dose, and the neutralisation dose or test dose, would be identical. Thus 99 + 1 being the exact L_0 dose, the addition of one part of protoxoid would be sufficient to kill the animal. In such a case the whole of the antitoxin unit would be neutralised by the protoxoids, and the single dose of toxin would be left to do its work of killing the animal. Here it would not be necessary to add any toxin at all to the mixture to kill the animal; the protoxoid is sufficient of itself to neutralise the antitoxin, leaving the toxin free, just as the addition of a drop of hydrochloric acid to the above chemical mixture would set acetic acid free. As regards the syntoxoids, there can be no actual evidence of their existence, as they should act exactly as does the toxin in regard to neutralisation, but, of course, not in regard to lethal action. The epitoxoids behave to the toxin exactly as does the toxin to the protoxoids. It is the substance which enters last into combination, and, therefore, does not affect the equation in the same way. Ehrlich gives as an example a toxin-antitoxin mixture, equalling 90 + 10 toxin-epitoxoid-antitoxin mixture: these should give the exact neutral, or neutralised point; 11 toxin units must be added, in order to obtain the L_+ or lethal action, when the equation should be 100 toxin-antitoxin + 1 toxin free + 10 epitoxoid free to give the L_+ effect. In this case the toxin apparently disappears; it is, however, simply playing the part of the stronger acid in a chemical combination, and turning out the weaker acid which it sets free; not until there is an excess of the toxin do we get any of it free, just as there is no free hydrochloric acid present until the whole of the acetic, or weaker, acid has been turned out. It is evident from these equations that the protoxoids and the syntoxoids, if such there are, can in no way increase the value of D in the equation $L_0 \times D = L_+$. Indeed, it is evident that in an equation of this kind we have the only real evidence of the presence of epitoxoids, though, just as in the case of the protoxoid, the relation of the L_0 to the L_+, and of these to D, can only be determined by actual experiment. From the fact that with epitoxoids the value of D is very great, we must come to the conclusion that these epitoxoids have not only a comparatively small lethal action, but also exert but little local influence, as we very seldom obtain any great swelling or necrosis. On the other hand, I have frequently observed what Ehrlich and Madsen have both noted, where animals recover from the test dose of antitoxin: that with certain toxins the number of paralyses is comparatively high where the animal lives on to the end of the second or third week—a condition which seldom occurs when toxins (in small doses, of course) alone are given without antitoxins. It would appear, therefore, that the epitoxoids, although negative in other directions, may exert a certain trophic effect on the nerves, especially when given in considerable doses. Martin's experiments, already referred to, point in much the same direction, and my own experiments[1] confirm these conclusions in a most remarkable manner.

A weak chemical combination.

Toxoids and epitoxoids.

Pathological action of the toxoids.

Syntoxoids and epitoxoids purely theoretical substances.

As Ehrlich points out, these syntoxoids and epitoxoids are purely theoretical substances; but the epitoxoids may be distinguished from the other toxoids, although these cannot be distinguished from one another. It is well, therefore, to adopt Ehrlich's classification only so far as he divides his toxoids into toxoids and epitoxoids, the toxoids representing everything in the mixture which is not toxin or epitoxoid, but which has the power of neutralising certain proportions of antitoxin. The exact neutralisation point—L_0—may then be put in an equation in the following form:—

$L_0 = x$ (saturated toxoid) $+ y$ (saturated toxin) $+ z$ (saturated epitoxoid). The lethal doses contained are, of course, of known value, the absolute lethal activity giving the value of y. In the same way the L_+ value is obtained from the equation.

L_+ (which, of course, is L_0 and the quantity of the "toxin," &c., that is required to cause the death of the animal) $= x$ (saturated toxoid) $+ y + z$ (saturated toxin), the z here representing the number of epitoxoids that were saturated in the original solution + 1 free toxin (which now does the lethal work) $+ z$ (free epitoxoid, which has been turned out of combination by the stronger toxins and toxoids, and which therefore remains free, and, as we have seen, does comparatively little harm). From his observations on toxins Ehrlich has come to the conclusion that all toxins at some period or other may be said to have a theoretically exact lethal dose, which corresponds with its power of combining with antitoxin, by which it is exactly neutralised, and that, if the single lethal dose is found, a hundred times this amount should exactly neutralise one antitoxin unit; but that in course of time a process of conversion of toxoids into epitoxoids takes place, the epitoxoids being formed at comparatively high temperatures—*i.e.*, when the broth is left in an incubator or in a warm room, or exposed to light—but that the other toxoids, although formed in the same way on the toxic solution being kept, are only formed when the temperature is low.

Preservation of test toxins.

It is evident from this, therefore, that as these toxoids do not interfere to the same extent with the value of the test dose as does the presence of the epitoxoids, test toxin solutions should always be kept cool and in the dark, and, as far as possible, protected from the atmosphere. The epitoxoids are apparently much more stable than are the toxins and other toxoids, and their value once found, they remain comparatively stable for long periods. It is curious, however, that this disintegration does not take place in all samples of toxin; for example, in the sample that was supplied from our laboratories to Professor Ehrlich, the lethal activity remained at 96, as against a calculated 100, for a considerable period, but most of the other toxins that were examined

(1) *Brit. Med. Journ.*, 1898; vol. ii. p. 593.

underwent a very curious breaking up. In five of them two-thirds of the toxin was converted into toxoids; so that in the one case the calculated lethal dose, in place of being 100 or thereabouts, was reduced to 33, although the neutralising power and dose remained practically the same, whilst in the other, in place of remaining at 100, it fell to a figure at or near 50, indicating that the power of neutralisation remaining the same, the lethal activity was diminished by two-thirds or one-half; that toxoids have been formed in these proportions, and therefore the L_+ dose is only one-third or one-half of the calculated lethal value when the test dose is mixed with antitoxin. The exact neutralising value of a pure toxin, then, should be exactly the number of toxin units; but in a mixture of x toxoid + y toxin + z epitoxoid the neutralising value when mixed with antitoxin is the sum of $x + y + z$, and in two toxins Ehrlich was actually able to determine the exact value of all of these three factors. Of one of these he found that the single lethal dose was 0·0025 c.c. for a guinea-pig of 250 grammes. Here the equation that he obtained was—

$$\begin{array}{l} L_+ \; 0{\cdot}25 \;\; = 100 \text{ toxin doses.} \\ \underline{L_0 \; 0{\cdot}125 = \;\; 50 \text{ toxin doses.}} \\ D = 0{\cdot}125 = 100\,\% \; = 50 \text{ toxin doses.} \end{array}$$

Here 50 per cent. of the neutralising material is not toxin, and 50 per cent. is. It is necessary, therefore, to multiply the figures obtained by 2 in order to get the theoretical value of x, y, and z. We therefore have the sum of $200 = x + y + z$; y must equal 50; we have, in addition, $50 = x$, and the remainder must equal z; so that the equation should run—

50 toxoid + 50 toxin + 100 epitoxoid. The multiplication by 2 is because this toxin has weakened off dichotomously, and is only one-half the original strength.

Importance of these experiments in connection with standardisation of toxins and antitoxins.

It is important to bear in mind the fact that the toxin used by us in testing many of our earlier antitoxins had this high lethal value, and that it corresponded so nearly to the theoretical calculation, because on this depends the fact that our earlier estimations were so substantially accurate (96 instead of 100) as much of the testing carried out was done on purely theoretical grounds, on the supposition that the original statement made by Behring and Ehrlich as to the lethal value of a neutralising dose of toxin held good throughout; and it was assumed, after a considerable series of experiments had been made, that this was the case, from the fact that the results obtained coincided so closely with those described; and, although the coincidence was not absolute, and the very fact that the results came out so closely to what they should theoretically be, led us to rely somewhat too implicitly upon the theoretical standard, and it was only when other toxins were examined that the conclusion could be arrived at that it was necessary to standardise each separate toxin against a standard antitoxin, though this precaution had been adopted as a matter of routine to guard against any possible fallacies.

It is an interesting point, too, that the toxin used in all the earlier experiments, though kept cool (at fairly constant temperature), and exposed to the air as little as possible, was not treated with any preserving fluid, nor covered with toluol; it had, however, been carefully filtered and all the bacilli removed.

Test toxins become stable in time.

From Ehrlich's investigations it is evident that a test toxin that is to be used (*i.e.*, to be kept as a standard test toxin) should not only be carefully prepared, but should be kept under observation for a lengthened period, and should not be used until it has arrived at what may be called a stable condition—a condition corresponding apparently to one of the schemes given by Ehrlich in which the toxin has broken up either in a tripartite fashion, or dichotomously—but as soon as the toxin has become divided in one of these proportions into toxin and toxoids, it may be looked upon as having become stable, and therefore ready for standardisation; at the same time it must be borne in mind that this process should be allowed to go on in a cool place and away from light and air, otherwise epitoxoids are formed and there is a lowering of the neutralising value of the "toxin" as a whole, as the larger the proportion of epitoxoids present, the larger must be the test dose. The great importance of Ehrlich's work appears to be, if these figures hold good—and my experience confirms them, at any rate so far as the question of practical standardisation of antitoxin goes—that it is no longer necessary to depend entirely upon an arbitrary standard as were this at any time to be lost it should be possible, by means of the use of *a series* of toxins, to reproduce the standard with almost mathematical accuracy.

Preservation of toxins.

I found that the most permanent sample of test toxin that we ever obtained was one that was filtered, filled into sterile test tubes, plugged at once with sterile cotton wadding, and covered with india-rubber caps. This, placed in a dark room kept at about from 8 to 12 degrees above freezing point, remained apparently unaltered for at least five months, but the toxin in a few tubes at the end of the series which were exposed to light undoubtedly fell away somewhat. The next toxin of the series was prepared by killing the diphtheria bacilli with carbolic acid. This was filtered and kept in the same way, but there was such a rapid falling off in its strength that several serious errors in connection with the testing of the antitoxins sent out were made—*i.e.*, the antitoxins were not so potent as appeared from the tests. About this time Professor Ehrlich sent word that he was using toluol for the purpose of sterilising his cultures, and was also keeping a layer of this substance on the surface of the toxin for the purpose of preventing oxidation; he had found, he stated, that he was thus able to keep his toxin permanently and at a fixed strength. Toluol was accordingly added to our test toxin—both to that in bulk, and to some small quantities that had been put into separate bottles instead of into test tubes, as in the case of the very stable toxin with which we had performed our earlier experiments. The toxin in bulk remained stable, but that which had been preserved in smaller quantities and had been placed in bottles that had been washed out with carbolic acid or trikresol rapidly deteriorated, and the use of one or two of these small quantities that had been kept for some time again led to errors in the testing of the strength of some of the antitoxic serum sent out. Another source of error on one or two occasions was the mixing of two separate toxins after they had been filtered.

Toluol as a preserving agent for toxins.

They were first tested, and their strengths having been determined they were mixed in proportions to give a definite strength. This mixture was tested at once and carefully standardised, but a fall in the strength of the mixture appears to have commenced at once and to have gone on steadily and constantly until it had fallen very materially from the original strength. As several tests were made with toxin of falling strength before the rapid fall was recognised, one or two antitoxins were on this account sent out considerably below the proper standard. One or two other antitoxins were below the proper standard, although they were tested with a small quantity of Ehrlich's own test toxin which remained after a series of experiments had been completed. At that time the fact had not been appreciated that even when under toluol small quantities of a test toxin which is perfectly stable in bulk may rapidly deteriorate. The same thing had already been noticed in connection with the small quantities that had been placed under toluol, but here the fall had been ascribed to the presence of traces of trikresol or carbolic acid, and I was therefore not on my guard against this fall of strength in the small quantities of toxin in which these substances were not present. This fall was soon detected, but these experiences made it evident that in order to obtain anything like constant results it was absolutely necessary to standardise test toxin from time to time by means of a standard antitoxin. Through the kindness of Professor Ehrlich, I was supplied by the German Government with a standard antitoxin which remained stable for at least three months, and since that date Professor Ehrlich has sent to me standard antitoxin as required; and I take this opportunity of expressing to him and to his colleague, Dr. Dönitz, and to the German Minister of Education, my most sincere thanks, and my appreciation of the courtesy and kindness with which on all occasions my requests for information and advice have been met.

Thanks to German Government.

Description of method of testing.

With a stable toxin the testing of antitoxin by Ehrlich's original method was a comparatively easy matter when once the different natures of the swellings and the nature of the general reactions had been carefully observed, and it may be well here to give the method of testing as used in our laboratory, and some of the results obtained. It is at once evident that in order to ensure satisfactory results the utmost care must be exercised, first, in obtaining accurately graduated pipettes each of which shall be standardised against all the others, and then to use these properly. It was found, after some trial, that the best method of making very high dilutions is the following:—Specimen tubes with flat bottoms, and sufficiently large to hold about 14 or 15 c.c., others holding 30 or 40 c.c., and small ones containing about 5 c.c., are thoroughly washed, plugged with clean cotton wadding, and then sterilised in the dry air chamber at a temperature of about 150-170° C. (= 302-338° F.). Let it be assumed that dilutions of 1-2,000th, 1-3,000th, and 1-5,000th are to be made of a serum to be tested—that is, the serum is to be tested for strengths of 200, 300, and 500 units per c.c. A wooden block with holes bored deep enough and large enough to receive the largest sized tubes—the smaller ones will, of course, easily go in—is prepared. There are now arranged in a row, in this block, three of the medium-sized tubes, two of the larger ones, and one of the smaller ones. For convenience of description we will call these tubes Nos. 1, 2, 3, 4, 5, and 6. Into each of the medium-sized tubes—*i.e.*, Nos. 1, 2, and 3—a carefully measured quantity of 9 c.c. of sterile normal saline solution is pipetted by means of a 10-c.c. pipette; into the first of the large-sized tubes—*i.e.*, No. 4—is measured 19 c.c. of normal saline solution; into the second—*i.e.*, No. 5—29 c.c.; and into the small tube—No. 6—4 c.c. One c.c. of the serum to be tested is then measured by means of a standardised full-delivery pipette and transferred to the first of the medium tubes, No. 1; the pipette is washed out by filling and emptying the mixture until the whole is thoroughly mixed. We have thus a dilution containing 1 in 10; of this 1 c.c. is taken with this same pipette—after it has been carefully washed out, first with cold sterile saline solution, and then with boiling water, and allowed to cool—and transferred to the second tube, No. 2. The same process is gone through with tube No. 3; so that we have now in tubes Nos. 1, 2, and 3 dilutions of 1 in 10, 1 in 100, and 1 in 1,000. From tube No. 2, 1 c.c. of the mixture is transferred to tube No. 4, and 1 c.c. to No. 5; so that we have in these two tubes dilutions of 1 in 2,000 in one, and 1 in 3,000 in the other. From tube No. 3, 1 c.c. is transferred to No. 6 tube, in which there is then a dilution of 1 in 5,000. From each of the three last dilutions 1 c.c. is withdrawn and placed in three corresponding small tubes, each of which is fitted into a second hole bored in the wood block opposite the dilution from which the test dilution is taken. We have then in each of these small tubes 1 c.c. of a dilution, one of them containing 1-2,000th of a c.c. of the original serum, the second 1-3,000th of a c.c., and the third 1-5,000th.

Apparatus used.

Details of mixing.

To each of these small tubes, opposite Nos. 4, 5, and 6, is added the test dose—*i.e.*, the 10 lethal doses of the test toxin—and then the mixture is further diluted by the addition of a sufficient amount of sterile 1 per cent. saline solution to make up each of the mixtures to about 4 c.c. In cases where the test toxin is of considerable strength, and where, consequently, small quantities would have to be measured if it were used in its full strength, it is well to dilute with normal saline solution in equal bulk, so that the test dose of the mixture is double that of the original toxin.

I may here mention that Professor Ehrlich, in making his dilutions, instead of flat-bottomed test tubes, uses small narrow-mouthed bottles, which are carefully washed and sterilised, the mouths being closed with cotton wadding plugs until they are used; and, in place of keeping the tubes in deep holes in blocks of wood, he covers them with little tin canisters which effectually protect the fluid contained in the bottles against the action of light. He also closes the mouth of the bottle with a clean new cork which is burnt in a Bunsen flame immediately before it is inserted. This cork serves two purposes: in addition to closing the mouth of the bottle so that the fluid may be thoroughly well shaken and thus mixed, there are detached in this process of shaking small particles of the burnt cork, which may be seen floating in the fluid as soon as the mixture is allowed to rest. The reason for this will be seen immediately.

Details of injection.

The mixture is now ready to be injected. Previous to this there have been selected from a number of half-grown guinea-pigs animals that are steadily increasing in weight, that exhibit no trace of disease of any kind, and that weigh, at the time they are taken, from 250 to 275 grammes. These animals are carefully described and the descriptions entered in the record book opposite the experiments with which the animals are specially concerned. The 4 c.c. of one of the mixtures of toxin and antitoxin is drawn into a syringe that has been carefully sterilised by means of carbolic acid and strong spirit, and then washed out with sterile saline solution. An assistant then holds the guinea-pig, taking the head and fore-limbs in the left hand and the hind-limbs in the right hand, the animal resting comfortably on its back across the palms of the hands. The hypodermic needle is then taken in the right hand of the operator, and the skin of the guinea-pig is raised, a little to the left of the xiphoid cartilage, and the needle is inserted into the subcutaneous tissue and is made to traverse the subcutaneous tissue *superficially to the muscles* a little to the left of the median line, so that it runs from before backwards above the aponeuroses of the muscles forming the abdominal wall. The whole of the mixture is then slowly injected into the subcutaneous tissue and the needle is withdrawn. It is very important that the needle should be felt immediately under the skin along the whole of its track. As a rule the animals remain perfectly quiet under this operation, which appears to give no pain, provided that the needle is sharp and that the injection is made *beneath* the skin, and not into it. Each of the selected guinea-pigs is injected in this way with the dilution assigned to it.

The careful disposition of the needle before the injection is made is a matter of very great importance. If the fluid passes into the muscle beneath the aponeurosis and away from the middle line, the swelling is never so marked or so localised as when it is injected purely subcutaneously. The same kind of reaction is not obtained, and the results may be very misleading indeed.

Test animals examined daily for four days.

At the end of 24 hours these animals are examined, and again on the second, third, and fourth days.

If we suppose that the antitoxin being tested contains 300 units per c.c., the appearances in the animals injected with the above mixtures would probably be as follows:—At the end of 24 hours in animal No.1, receiving the test dose of toxin and 1-2,000th c.c. of serum, there will be absolutely no trace at the site of injection that anything had been done. In animal No. 2, the one containing 1-3,000th c.c. of serum, there may be some slight swelling—not very firm, but not soft or œdematous; whilst in the third, which has received 1-5,000th c.c., there will probably be a large soft swelling extending for a considerable distance around the seat of injection: in some cases, and in such a case as this, it will probably cover a considerable portion of the abdomen. The first animal has probably gained considerably in weight, the second slightly, whilst the third may or may not have fallen in weight.

At the end of 48 hours animal No. 1 has still no swelling, and its weight is increased; in animal No. 2 the swelling is perhaps slightly harder, but little, if any, larger, and the weight may again have increased slightly; whilst animal No. 3 in all probability is dead, having lost considerably in weight.

On the third day No. 1 is still increasing in weight, and there is no trace of swelling; in No. 2 the swelling has almost disappeared, and the weight is stationary or may have slightly increased; No. 3 is certainly dead.

On the fourth day No. 1 as before. No. 2 is increasing in weight more rapidly; there is no trace of swelling left, or there may be merely a very slight thickening, scarcely perceptible, along the track of the needle, and especially at the point at which the needle entered, and there is a loss of hair over and around the track: where this is the case the dosage is exactly correct.

This is a typical example of the reactions obtained in one of our series of testings.

Sources of fallacy.

It was soon evident, however, when the results obtained came to be compared with those of other workers, that the subjective judgment might differ somewhat in different cases: what one man would call a distinct swelling another would call merely a trace; and it was found that each individual had to fix his own standard, judging his results against a standard antitoxin with a standard toxin. These subjective differences, of course, lead to differences of opinion as to the relative strengths of individual antitoxins tested by different persons. So marked were the differences in some cases that we had commenced to experiment with a method of testing in which the lethal rather than the local action of the toxin should be taken as the determining factor in the process of measurement of strength of antitoxin. We had got as far as determining that a dose of the toxin standardised as killing in two days was more reliable than one killing at a later date, when we received from Professor Ehrlich an abstract of his new method of testing, which was shortly afterwards published in full. A glance at this new method at once showed that we had here a great advance on anything that had hitherto been done in connection with the accurate determination of the strength of antitoxic serums.

Ehrlich's new method of testing.

Certain of the factors in the equation remain the same in the new method, but others are distinct variations from those relied upon in the earlier method, and the ultimate result depends, not on the determination or measurement of subjective phenomena, but upon the time at which the animal dies after the injection of the test mixture. The factors that still remain the same are the antitoxin unit, the old standard being still maintained; the lethal unit was also supposed to be approximately the same, though, as will be seen later, this varies considerably in the case of different toxins. In place of the "10 times" lethal dose, Ehrlich bases his calculation on a "100 times" lethal dose, and therefore injects a sufficient quantity of toxin to exactly neutralise his standard unit of antitoxin; his neutralisation indication in this instance being that the animal must live on to the fourth day after the injection, but must die before the end of that or the following day. The loss of weight, the swelling, and other phenomena are left entirely out of account, the time of death only being taken as the determining factor. Having in this way determined the amount of toxin that will exactly neutralise one unit of antitoxin, he proceeds as before to mix his serum dilutions to tenths instead of hundredths, and hundredths instead of thousandths. For example, let it be assumed that the same serum, a note of the testing of which has been given above, is to be tested by this new method. By means of graduated pipettes dilutions of the serum of 200, 300, and 500 are made as follows:—Into one of the large tubes 19 c.c. of saline is measured, and then 1 c.c. of the antitoxic serum is added. Into a second tube 9 c.c. of saline and 1 c.c. from tube No. 1: in this second tube there will then be a dilution of 1 in 200. Into a third tube 14 c.c. of saline solution is measured; 1 c.c. from the first tube added to this gives a dilution of 1 in 300. Into the fourth tube 24 c.c. of saline solution is measured; 1 c.c. from the first tube added to this gives a dilution of 1 in 500. From each of these dilutions 1 c.c. is pipetted into small test tubes, and to each of these is added the full test dose, as above determined, of toxin. (Latterly dilutions of half the above strengths are made, and 2 c.c. of the dilution instead of 1 c.c. is used). The toxin solution is usually made by diluting the toxin with 0·7 or 1 per cent. saline solution to such a strength that 2 or 3 c.c., as the case may be, contains the full test dose. After allowing the dilutions (one of antitoxin and three of test toxin, or two of each, according to the dilutions used) to stand for 10 minutes or a quarter of an hour, each is injected into a separate animal, carefully weighed and selected, as above. Here again it may be well to follow the result on the supposition that the antitoxic value of the serum is 300 units per c.c. The first animal shows no trace of the action of the toxic substance at any time; its weight rises, there is no local swelling, and the animal remains perfectly well, except that there *may* be a loss of hair near the seat of injection. In the case of the second animal there is probably a fairly well-marked swelling, commencing perhaps even on the first day, but certainly being distinct and somewhat indurated, and spreading for some distance from the seat of injection on the second day; this animal probably loses weight by the second day, and on the third and fourth days this loss of weight may be considerable; though the guinea-pig lives until the fourth day if the strength be exactly 300, it should then die, certainly on the fifth day; if, however, it is slightly over 300, the animal may live until the fifth or sixth day, or even recover altogether. The injection of the dilution of 1 in 500 gives rise to marked local swelling and loss of weight, even at the end of 24 hours; in some cases the animal may be dead by this time, but it is sure to be found dead on the morning of the second day, this indicating that the amount of serum injected has been quite insufficient to neutralise the test dose of toxin. In this method the swelling is entirely ignored; the same holding good also of loss of weight and hair. The time of death (on the fourth day after injection) is the single factor on which dependence for the determination of the strength of an antitoxin is placed.

TABLE CXXX.

EXPERIMENTS WITH ANTITOXIN SENT TO PROFESSOR EHRLICH.

Day.	Dilution of Antitoxic Serum.	Quantity of Diluted Serum injected.	Test Dose of Toxin (received from Ehrlich) used.	Weight of Guinea-Pig.	Local Reaction.
				Grammes.	
0	$\frac{1}{240}$	1 c.c.	0·23 (= 10 normal lethal doses) diluted to 1 c.c. with normal saline.	260	
1	...	...	...	265	Very slight œdema.
2	...	...	...	250	Perhaps trace of thickening.
3	...	...	...	...	
4	...	...	...	250	Mere trace of induration (?). Pass 240 A.U. per c.c.
0	$\frac{1}{250}$	1 c.c.	0·23	270	
1	...	...	...	285	Slight swelling.
2	...	...	...	280	Swelling a little more marked.
3	...	...	...	...	
4	...	...	...	305	Trace of induration (?). Pass 250 A.U. per c.c.
0	$\frac{1}{250}$	1 c.c.	0·23	260	
1	...	...	...	270	*Nil.*
2	...	...	...	280	Trace of thickening.
3	...	...	...	290	Perhaps trace of thickening.
4	...	...	...	295	Not a trace. Pass 250 A.U. per c.c.
55	...	...	...	...	Alive and well.
0	$\frac{1}{260}$	1 c.c.	0·23	250	
1	...	...	...	265	Distinct swelling.
2	...	...	...	245	Swelling quite marked.
3	...	...	...	...	
4	...	...	...	265	Very slight thickening (?). Does not pass 260 A.U. per c.c.
0	$\frac{1}{270}$	1 c.c.	0·23	260	
1	...	...	...	245	*Nil.*
2	...	...	...	245	Slight thickening.
3	...	...	...	245	Distinct deposit.
4	...	...	...	250	Deposit. Does not pass 270 A.U. per c.c.
55	...	...	...	...	Alive and well.
0	$\frac{1}{280}$	1 c.c.	0·23	275	
1	...	...	...	285	*Nil* (?).
2	...	...	...	290	Thickening.
3	...	...	...	285	Deposit.
4	...	...	...	280	Deposit. Does not pass 280 A.U. per c.c.
27	...	...	...	180	Dead.

In order to compare the results obtained in the Laboratories of the Royal Colleges by the older method of testing, with those obtained by Ehrlich with the newer method, a fairly strong antitoxin was standardised as accurately as possible by means of a toxin the exact strength of which had immediately before been accurately determined. At the same time a sample was forwarded, sealed and numbered, without any statement as to the strength of the antitoxin, to Professor Ehrlich, who had in the meanwhile kindly offered to standardise such an antitoxic serum. By the old method, and using the accurately standardised toxin, the value of this special serum was determined as being from 250 to 260 units per c.c. (Table CXXX.).

Comparison of results obtained in our laboratories and by Ehrlich.

TABLE CXXXI.

PROFESSOR EHRLICH'S REPORT, OCTOBER 1ST, 1897, COMMUNICATED WITH THE PERMISSION OF THE GERMAN MINISTER OF EDUCATION; SERUM RECEIVED FROM DR. WOODHEAD.—Tested by the new method of estimation, which at that time had not been published. With toxin of autumn (mark brown). Single lethal dose for guinea-pig of 250 grammes = 0·0009 c.c. Test dose (= L_+), 0·355 c.c. Owing to the difficulty of measuring 0·355 c.c., the toxin in the first four experiments was first diluted with equal parts of water, and 0·71 c.c. of this mixture used for the purpose of testing.

Day	Dilution of Antitoxic Serum injected.	Quantity of Diluted Serum injected.	Test Dose of Toxin (0·355 + 0·355 Saline) used.	Weight of Guinea-Pig.	Local Reaction.
				Grammes.	
0	$\frac{1}{1000}$	4 c.c.	0·71 c.c.	245	= Test for 250 units per c.c.
1	...	...	...	245	Trace of infiltration.
2	...	...	...	240	A strand.
3	...	...	...	250	Extended.
4	...	...	...	250	Distinctly less, &c.
0	$\frac{1}{1200}$	4 c.c.	0·71 c.c.	270	= Test for 300 units per c.c.
1	...	...	...	250	Thumb-thick infiltration.
2	...	...	...	...	Dead. Marked œdema, and moderate thickening of muscles of abdominal wall. Marked hydro-thorax. Adrenals moderately reddened. Acute diphtheria poisoning.
0	$\frac{1}{1120}$	4 c.c.	0·71 c.c.	240	= Test for 280 units per c.c.
1	...	...	...	230	Marked infiltration.
2	...	...	...	220	,, ,,
3	...	...	...	...	Dead. Thick induration of abdominal wall. Adrenals dark red. Distinct hydro-thorax. Acute diphtheria poisoning.
0	$\frac{1}{1040}$	4 c.c.	0·71 c.c.	230	= Test for 260 units per c.c. This animal too small. Test not reliable.
1	...	...	...	235	Marked infiltration.
2	...	...	...	230	,, ,,
3	...	...	...	215	,, ,,
4	...	...	...	200	Infiltration harder and flat (band-like).
5	...	...	...	200	Band.
6	...	...	...	195	,,
7	...	...	...	190	Commencing necrosis.
0	$\frac{1}{540}$	4 c.c.	0·71 c.c. of undiluted toxin	270	= Test for 270 units per c.c.
1	...	...	...	265	Moderately well-marked infiltration.
2	...	...	...	245	Marked infiltration. Animal sleepy.
3	...	...	...	...	Dead. Typical diphtheria poisoning.
0	$\frac{1}{535}$	4 c.c.	0·71 c.c. of undiluted toxin	260	= Test for 267·5 units per c.c.
1	...	...	...	245	Marked infiltration.
2	...	...	...	225	,, ,,
3	...	...	...	220	Very great infiltration. Weak and dull. Dead at mid-day. Large thick œdematous hardening of abdominal wall. Adrenals only slightly reddened. Small quantity of sero-sanguinolent exudation into pleura.
0	$\frac{1}{530}$	4 c.c.	0·71 c.c. of undiluted toxin	250	= Test for 265 units per c.c. = exact antitoxic value of serum.
1	...	...	...	240	Marked infiltration.
2	...	...	...	230	,, ,,
3	...	...	...	220	Very marked infiltration.
4	...	...	...	...	Dead. Thick induration of abdominal wall. Adrenals greatly reddened. Diaphragm hæmorrhagic. A few drops of pleuritic transudation. Diphtheria poisoning.
0	$\frac{1}{525}$	4 c.c.	0·71 c.c. of undiluted toxin	250	= Test for 262·5 units per c.c.
1	...	...	...	230	Fairly marked infiltration.
2	...	...	...	215	More extensive.
3	...	...	...	205	Marked infiltration.
4	...	...	...	205	,, ,,
5	...	...	...	180	Commencing necrosis.
6	...	...	...	170	,, ,,
7	...	...	...	160	Very dull.
8	...	...	...	...	Dead. Thick induration in abdominal wall. Adrenals reddened.

The result of Professor Ehrlich's experiments, carried out at about the same time, I did not learn until I went to Berlin in the autumn of 1897, when Dr. Dönitz gave me a copy of the full experiments, the testing in half of the experiments having been carried out by the neutralisation of a double test dose instead of a single one—*i.e.*, with a calculated 200 times the nominal lethal dose instead of with the calculated 100 times. On a comparison of the two sets of figures given below, it will be seen that our testing was within 3 per cent. of that obtained in the German Government Testing Station at Berlin (Table CXXXI.).

TABLE CXXXII.

Details concerning Serums supplied to the Hospitals under the Board from September 2nd, 1895, to December 31st, 1897.

Number of Serum.	Number of Bottles.	C.C.'s in each Bottle.	Strength sent out, in Units per C.C.	Time between the Two Testings, in Months.	Expected Strength at Final Testing, in Units per C.C.	Actual Strength at Final Testing, in Units per C.C.	Percentage Fall from Strength claimed.
1 (1)	88	20	10	28	8·2	10	...
2 (1)	164	20	15	28	12·3	30	...
3 (1)	70	20	6	28	4·9	12	...
4 (1)	134	20	10	27	8·3	35	...
5 (3)	156	20	15	27	12·4	25	...
6 (2)	158	20	10	27	8·3	20	...
7 (1)	53	20	20	26	16·7	40	...
8 (3)	32	20	15	27	12·4	40	...
9 (1)	16	20	15	27	12·4	45	...
10 (2)	16	20	13	27	10·8	45	...
11 (2)	8	20	13	27	10·8	45	...
12 (2)	26	20	20	27	16·6	55	...
13 (2)	29	20	20	26	16·7	50	...
14 (3)	306	20	10	26	8·3	40	...
15 (3)	79	20	10	26	8·3	40	...
16 (2)	170	20	25	26	20·9	25	...
17 (2)	52	20	25	26	20·9	25	...
18 (4)	713	20	35	25	29·5	40	...
19 (1)	114	20	35	24	29·7	40	...
20 (2)	129	20	25	24	21·2	45	...
21 (3)	143	20	25	24	21·2	50	...
22 (2)	192	20	25	25	21·1	45	...
23 (2)	96	20	15	25	12·6	20	...
24 (3)	97	20	20	25	16·8	25	...
25 (3)	128	20	35	25	29·5	40	...
26 (6)	97	20	40	24	34·0	45	...
27 (5)	491	20	30	23	25·6	33	...
28 (5)	164	20	30	23	25·6	33	...
29 (1)	193	20	30	23	25·6	30	...
30 (5)	94	20	50	24	42·5	55	...
31 (4)	41	20	40	24	34·0	40	...
32 (2)	192	20	50	24	42·5	35	17·6
33 (1)	234	13	75	22	64·6	75	...
34 (1)	256	13	75	23	64·2	50	14·2
35 (1)	264	13	75	23	64·2	65	...
36 (1)	398	4	250	24	175·0	58	66·8
37 (1)	571	5	200	23	142·5	160	...
38 (2)	260	10	100	24	85·0	42	50·6
39 (5)	603	7	140	23	99·7	125	...
40 (1)	240	7	140	24	98·0	100	...
42 (1)	189	5	200	24	170·0	120	30
43 (1)	290	10	100	22	72·5	100	...
44 (1)	470	7	140	22	101·5	115	...
45 (1)	609	6	165	22	119·6	140	...
46 (3)	495	8	125	22	90·6	125	...
50 (1)	342	10	100	20	87·5	100	...
51 (1)	453	7	140	20	105·0	140	...
52 (1)	277	10	400	20	233·3	400	...
53 (1)	579	10	400	20	233·3	400	...
54 (4)	667	5	200	20	150·0	150	...
55 (4)	794	5	200	20	150·0	150	...
56 (1)	460	10	100	20	87·5	100	...
57 (1)	497	10	150	20	112·5	140	...
58 (1)	491	10	100	20	75·0	100	...
59 (1)	313	10	100	20	75·0	100	...
60 (4)	1,340	10	400	19	241·6	380	...
63 (1)	140	10	200	17	157·5	250	...
64 (3)	719	10	100	21	86·8	65	25·1
66 (2)	195	10	255	16	204·0	265	...
67 (2)	326	10	400	19	225·0	350	...
68 (2)	824	10	400	18	250·0	215	14·0
69 (1)	464	10	100	17	89·3	30	66·4
70 (2)	144	10	100	17	No sample	No sample	...
71 (1)	686	10	100	18	88·7	75	15·4
72 (2)	197	10	100	18	88·7	75	15·4
73 (1)	168	10	400	16	266·6	360	...
74 (1)	225	10	400	16	266·6	310	...
76 (1)	365	10	100	13	91·8	65	29·2

Number of Serum.	Number of Bottles.	C.C.'s in each Bottle.	Strength sent out, in Units per C.C.	Time between the Two Testings, in Months.	Expected Strength at Final Testing, in Units per C.C.	Actual Strength at Final Testing, in Units per C.C.	Percentage Fall from Strength claimed.
77 (1)	334	10	150	18	116·2	80	31·1
78 (3)	545	10	300	15	No sample	No sample	...
79 (3)	211	10	200	13	162·5	50	69·2
*80 (5)	2,626	10	400	14	291·6	180	38·2
84 (1)	80	10	400 E	9	325·0	350	...
85 (5)	3,103	10	400	13	291·6	400	...
88 (2)	300	10	300	8	270·0	300	...
89 (2)	176	10	300	8	270·0	300	...
90 (2)	367	10	300	8	270·0	300	...
91 (2)	296	10	300	8	270·0	300	...
92 (2)	1,035	10	300	8	270·0	300	...
93 (6)	398	10	200	7	182·5	200	...
94 (6)	288	10	200	8	180·0	200	...
95 (6)	332	10	200	8	180·0	200	...
96 (6)	160	10	200	8	180·0	200	...
97 (2)	588	10	200	8	180·0	200	...
98 (4)	264	10	200	8	180·0	200	...
99 (6)	380	10	200	6	175·0	200	...
100 (5)	592	12	166	6	153·5	200	...
101 (5)	182	11	180	6	166·5	200	...
102 (2)	560	12	166	7	151·4	166	...
103 (2)	302	10	200	7	182·5	200	...
104 (3)	406	10	200	4	190·0	200	...
105 (2)	557	10	200	5	187·5	200	...
106 (2)	312	10	200	4	190·0	200	...
107 (2)	293	10	200	4	190·0	200	...
108 (2)	192	10	200	4	190·0	200	...
110 (7)	223	10	200	4	190·0	160	15·7
111 (8)	279	10	200	4	190·0	200	...
112 (2)	418	10	200	4	190·0	200	...
113 (5)	1,230	10	200	3	192·5	200	...
114 (3)	714	10	200	3	192·5	200	...
115 (3)	208	10	200	2	195·0	200	..
116 (6)	246	10	200	2	195·0	200	...
117 (6)	437	10	200	2	195·0	200	...
118 (2)	1,114	10	200	2	195·0	200	...
119 (7)	588	10	200	2	195·0	160	18·0
120 (3)	1,306	10	200	1	197·5	160	19·0
121 (2)	992	10	200	2	195·0	195	...
122 (4)	2,612	12	160	1	158·0	160	...
123 (3)	350	10	200	1	197·5	200	...
124 (4)	320	10	200	1	197·5	195	1·2
125 (4)	1,008	10·5	190	1	187·6	190	...
126 (3)	462	11	180				
127 (5)	483	10	200				
128 (2)	392	10	200				
129 (4)	1,558	12·5	160				
130 (2)	415	10	200				
131 (3)	1,850	7	314				
132 (4)	2,170	9	230				
133 (1)	293	10	200				
134 (1)	57	8	250				
135 (4)	1,851	7·75	265				
136 (5)	3,948	7	290				
137 (5)	4,290	5	400				
138 (4)	1,433	9	...				
	781	4·5	475				
139 (4)	2,305	8·5	475				
140 (1)	929	5	200				
141 (4)	2,192	10	400				
142 (1)	230	7·75	230				
143 (1)	610	6·75	275				
144 (1)	639	6·25	325				
145 (1)	388	9	225				
146 (4)	1,874	10	400				
147 (2)	848	8	250				
148 (1)	334	9	225				
149 (1)	447	10	400				
150 (6)	1,421	10	400				

It is evident, however, that accurate results can be obtained only when the standard toxin remains constant, and, as has already been noted, it was found from time to time that our standard toxin had fallen off, with the result, of course, that during any period in which the strength of the toxin was falling we had an apparent corresponding increase in the strength of the antitoxins. So satisfied was I that all our antitoxins were not up to the full strength that I determined, for the purpose of affording accurate information as to the strength of the various antitoxins used in the hospitals under the Board, to apply Ehrlich's new method, not only to the serums sent out after the description of this method had been published, but also to those which had been sent out to the hospitals under the Board from the very commencement of our work. This was now perfectly feasible from the fact that Professor Ehrlich had kindly placed at my disposal a supply of standard antitoxin by means of which we were able from time to time to control the strength of the test toxin used.

It had, of course, been fully recognised that antitoxic serum, although, under favourable conditions, *fairly* stable, still undoubtedly undergoes a certain amount of deterioration, even when kept under the most favourable conditions—*i.e.*, protected from light, air and heat, in well-stoppered bottles deposited in a cool dark chamber; nevertheless, I was not prepared to meet with a fall of more than from 5 to 20 per cent. per annum, except in some of the very high-value serums, as it appears now to be well recognised that the higher the value of the serum the greater is the percentage fall in strength. As a result of observation and reading I was prepared to find, however, that with the very weak serums there might be a fall of from 5 to 10 per cent. per annum—an average of 7½ per cent. per annum was, in this case, taken as the normal fall, and this fall was allowed for in all our calculations; with the medium serums of from 10 to 20 per cent.—average 15; and with the strong serums of from 20 to 30 per cent.—average 25. Under "weak" serum are included all serums ranging from 10 to 100 units per c.c., as "medium" serums all ranging between 100 and 300 units per c.c., whilst serums having anything above this potency are reckoned as "strong" serums. Instability of antitoxin. Average annual fall in potency.

With two exceptions (and of these samples had not been retained), the whole of the serums—up to No. 125—sent out have been re-tested; the results are given in Table CXXXII. In the first column is given the number of the antitoxic serum; as such serum may consist of the serum from a single horse only, or of a mixture of the serums from two or more horses, each is marked on the right of the numeral with a figure in brackets, which is put there to indicate that the sample consists of a mixture of the serum from a corresponding number of horses. In the second column is given the quantity of this serum supplied; in the next the dose in which it was sent out; in the fourth column is given the number of units per c.c. calculated at the time that the serum was sent out; in the fifth the number of units per c.c. as recently determined by Ehrlich's new method; in the sixth column we have the number of units to which it was expected that the value of serum would fall, calculating on the basis of deterioration above mentioned. Most serums sent out were mixtures.

On going carefully over the antitoxins one can tell almost at a glance where the different toxins were used. Up to No. 25, a toxin that was standardised for the first set of experiments, and which was taken as 10 times the minimum lethal dose, was used. At first it gave results very much too low, and it soon became evident that it was necessary to re-standardise it; the effect of this may be seen at intervals. Thus up to No. 16 the results were invariably very much lower than they should have been, the antitoxins in some cases being four times as strong as they were calculated to be. From this point up to No. 25 the results came out fairly accurately, except that, having "passed" a certain standard, some of the antitoxins were sent out as being of that strength, although we were aware that they were really considerably higher. Different toxins used in testing serum.

From No. 26 on to No. 55 another toxin was used—"toxin M"—the test dose of which was calculated at 0·5 c.c. On referring to the lethal action of this toxin at different dates, we found that on the 20th January 0·05 c.c. kills a 250-grammes guinea-pig within the test period, and it retained this strength for a considerable period. Thus the results up to No. 33 (February 21st) are, with one exception, exceedingly accurate. At this point a tube of toxin that had fallen off considerably in strength appears to have been used, as up to No. 40 several of the antitoxins have a markedly lower strength than that indicated. On the 25th March this toxin was again standardised, and was used up to the 3rd of April. A slight fall may be noted in one or two of the antitoxins, but nothing more than can be accounted for by the deterioration due to keeping; and even Nos. 54 and 55, which in a year and nine months appear to have lost 25 per cent. of their strength, were probably fully up to their strength at the time the testing was made, as both these two serums contained a proportion of certain serums which originally contained 400 units per c.c.

The next test toxin—"T. 40"—in a dose of 0·05 c.c. killed 250-grammes guinea-pigs within the test period; it remained at that strength up to June, and there were tested with it the serums from Nos. 56 to 67, all of which, as will be seen from the table, are as high, or higher, with one single exception, than they were calculated to be. One batch of this toxin that was opened and used, but not tested, on the 3rd of June, gave results very much too high; and we find, in consequence, that serums Nos. 68, 69, 71, 72, 76, 77, 79, and 80 were all of them considerably over-rated, though No. 73, which was tested with another toxin, was probably about the normal standard when it was distributed. No. 80 should have been sent out as containing 2,000, and not 4,000, units in 10 c.c., as it was never tested for the higher potency. A number of the bottles were recalled, but many had already been used. So the original figure of 400 units is retained and the percentage of error calculated on that basis.

From No. 84 onwards the testings were made with a toxin carefully filtered and kept in bulk in a large bottle. To this toxin no toluol, or antiseptic of any kind, was added. Every serum which had been tested with this toxin by the old method—up to No. 113—and by Ehrlich's new method—from Nos. 114 to 125—on being re-tested with Ehrlich's toxin, or with toxin standardised freshly against Ehrlich's standard antitoxin, came within 2½ per cent. of that originally calculated, with the exception of serums Nos. 110, 119, and 120, which in a very short time appear to have fallen something like 15–20 per cent.; all three of these were mixtures from at least three horses, two of them from seven, and each contained a quantity of old serum which on former occasions had been found to have appreciably fallen off in strength.

General data. In the table giving data concerning these antitoxic serums, it will be seen that of the 111 batches of serum sent out 77, or 69·4 per cent., are still up to the full strength, two are within $2\frac{1}{2}$ per cent., one within 5 per cent., two within 10 per cent., five within 15 per cent., six within 20 per cent., five within 25 per cent., two within 30 per cent., three within 35 per cent., two within 47 per cent., one each within 55, 58, 75, and 76 per cent. One, owing to an oversight—No. 69—was sent out untested, and two there are of which no sample remains to be tested; in one instance a 200-unit serum was labelled 400, and some of it had been used before the mistake was found out; a similar mistake was made with a 250-unit serum—No. 36—and as only a few bottles of it had been prepared it had all been used up before the mistake could be rectified. Sample No. 69, on being tested afterwards, was found to contain only 30 units per c.c. No. 78 cannot, however, be included amongst those that come up to full strength at the present date, as it was tested at a period when unstable samples of test toxin were being used.

After making allowances for the fall in strength, basing our calculations on the percentages mentioned above, which are based on the statements made by those who have had the most experience of the keeping properties of antitoxic serum, I find that of the 111 samples sent out during the period under consideration (Nos. 126 to 150 were sent out in 1898, and are therefore not included within this period), 91, or 81·99 per cent., in all probability contained the full number of antitoxic units claimed for them; whilst the others—20 in number, or 18·01 per cent. —might be classified as follows:—One came within 2 per cent., and may therefore be almost included in the first group; five came within a fraction of 15 per cent., three under 20 per cent., one within a fraction of 25 per cent.; two within a fraction of 30 per cent., one 31·1 per cent., one 38·2 per cent., one 50·6 per cent., two a fraction over 66 per cent., and one 69·2 per cent. of the strength claimed for them; and two of the serums could not be re-tested, as all the samples had been used up in the earlier experiments. Taking into consideration all the difficulties that had to be overcome at certain periods of our work, these results must be looked upon as eminently satisfactory.

Table CXXXIII. gives the number of doses of antitoxic serum and number of units of antitoxin supplied during the period under consideration.

TABLE CXXXIII.

Number of Doses and Units of Antitoxin supplied to the Hospitals under the Management of the Metropolitan Asylums Board.

Year.	Month.	No. of Doses.		No. of Units.	
1895	September	619		147,120	
"	October	660		137,410	
"	November	818		491,200	
"	December	731		425,500	
	TOTAL		2,828		1,201,230
1896	January	924		545,000	
"	February	776		610,400	
"	March	1,268		1,268,000	
"	April	1,188		1,188,000	
"	May	1,396		1,396,000	
"	June	1,525		1,525,000	
"	July	1,395		2,505,000	
"	August	1,073		1,820,000	
"	September	1,437		3,048,000	
"	October	1,192		2,830,000	
"	November	1,375		4,055,000	
"	December	1,875		4,864,000	
			15,424		25,652,400
1897	January	1,300		4,750,000	
"	February	1,050		4,089,000	
"	March	1,100		4,325,000	
"	April	1,300		5,125,000	
"	May	1,725		6,161,000	
"	June	1,964		5,092,000	
"	July	2,475		4,950,000	
"	August	2,650		5,300,000	
"	September	2,125		4,250,000	
"	October	2,700		5,400,000	
"	November	2,775		5,550,000	
"	December	2,700		5,400,000	
			23,864		60,392,000
	GRAND TOTAL		42,116		87,245,230

APPENDIX.

DETAILS OF CASES ADMITTED DURING PART OF THE YEAR 1894.

PERCENTAGE MORTALITY AT DIFFERENT AGES OF ALL CASES THAT HAVE BEEN BACTERIOLOGICALLY EXAMINED, AND IN WHICH DIPHTHERIA BACILLI WERE FOUND (SHOWING DAY OF DISEASE AS TAKEN FROM THE AMBULANCE NURSES' REPORT).

Here the number of cases was so small that it is unnecessary to state the figures in tabular form.

At the Fountain Hospital: Between the age of 3 and 4 years, one case on the fifth day; between 4 and 5 years, one case on the second and one on the fifth day; 5—10 years, two cases with one death on the third day, one case on the fourth, giving a percentage mortality at this age of 33·3 per cent.; 10—15 years, one on the first day, one on the second, and one on the fourth; 15—20 years, two on the fourth day; giving totals of one case on the first, two on the second, two with one death on the third, four on the fourth, two on the fifth, or a total of 11 cases with one death—a mortality of 9·09 per cent.

At the Eastern Hospital: Between 2 and 3 years, one case on the first day, which died; 4—5 years, one on the fourth day; 5—10 years, one on the second, and one on the third day; 10—15 years, one case on the seventh day; giving a total of one case (which died) on the first day, one on the second, one on the third, one on the fourth, one on the seventh, or five cases and one death—percentage mortality, 20 per cent.

At the South-Eastern Hospital: Between 1 and 2 years, one on the fourth, one on the sixth, one on the seventh; 2—3 years, two on the third, one on the fourth, one on the fifth; 3—4 years, one on the second, two on the third, one on the fourth, one on the fifth (died), one on the sixth, and one after the seventh; 4—5 years, one on the first, one on the second, one on the sixth, one after the seventh; 5—10 years, two on the second, four on the third; 10—15 years, one on the third, one on the seventh; 15—20 years, one on the seventh; 20 years and upwards, one on the second; a total of one on the first, five on the second, nine on the third, three on the fourth, two with one death on the fifth, four on the sixth, one on the seventh, four after the seventh, or 29 cases and one death—percentage mortality, 3·4.

PERCENTAGE MORTALITY AT DIFFERENT AGES OF CASES IN WHICH DIPHTHERIA BACILLI WERE FOUND, AND IN WHICH ANTITOXIC SERUM WAS INJECTED.

The day on which antitoxic serum was injected is reckoned from the appearance of the initial symptoms as reported by the Ambulance Nurse.

Fountain Hospital: Between 3 and 4 years, on the fifth day one case; 4—5 years, one case which commenced in hospital; 5—10 years, on the fourth day one case, one case which commenced in hospital and died; 10—15 years, one case which commenced in hospital; total, one case on the fourth day, one on the fifth, three, with one death, which commenced in hospital (33·3 per cent.), or five cases with one death (20 per cent.).

Eastern Hospital: Between 2 and 3 years, one case which commenced in hospital and died.

South-Eastern Hospital: Between 1 and 2 years, one on the seventh day, two commenced in hospital; 2—3 years, one on the third, one on the fourth, and one on the fifth day; 3—4 years, one on the third, and one on the fourth day; 4—5 years, one on the second, one on the fourth, one on the seventh day; 5—10 years, one on the second, two on the third, one on the sixth day; 10—15 years, one on the fifth, one on the seventh day; 20 years and upwards, one on the second day, or a total of three cases on the second day, four on the third, three on the fourth, two on the fifth, one on the sixth, three on the seventh, and two commenced in hospital, without a single death.

PERCENTAGE MORTALITY AT DIFFERENT AGES OF CASES IN WHICH DIPHTHERIA BACILLI WERE FOUND, BUT IN WHICH NO ANTITOXIC SERUM WAS INJECTED.

In the Fountain Hospital there were six cases with no deaths. The age-incidence of these cases was—one between the age of 4 and 5 years, one 5—10 years, two 10—15 years, and two 15—20 years.

At the Eastern Hospital: Between 4 and 5 years, one; 5—10 years, two; 10—15 years, one; or four cases with no deaths.

At the South-Eastern Hospital: Between 1 and 2 years, one; 2—3 years, one; 3—4 years, five cases with one death (20 per cent.); 4—5 years, one; 5—10 years, two; 15—20 years, one; or eleven cases with one death (9·09 per cent.).

TABLE Ia. showing the site of the affection in those cases in which Diphtheria bacilli were found, and Antitoxic Serum was injected. The total deaths and percentage mortality amongst these sets of cases (at different ages) are also shown.

1894.

FOUNTAIN HOSPITAL.

Ages.	Cases.						Total (cases).		Deaths.						Total (deaths).		Mortality per Cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
3 to 4 ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5 ...	...	...	1	...	..	1	...	1	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10 ...	...	1	1	...	...	2	1	1	...	...	1	...	...	1	...	1	0·0	100·0
10 ,, 15 ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total ...	2	1	2	...	...	5	3	2	...	..	1	...	...	1	...	1	0·0	50·0
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	0·0	50·0	0·0	0·0	20·0	...	...	...	...

EASTERN HOSPITAL.

Ages.	Cases: Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Total (cases): Faucial.	Laryngeal.	Deaths: Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Total (deaths): Faucial.	Laryngeal.	Mortality per Cent.: Faucial.	Laryngeal.
2 to 3 ...	...	...	...	1	...	1	...	1	...	...	...	1	..	1	...	1	0·0	100·0
Total ...	...	...	...	1	...	1	...	1	...	...	...	1	..	1	...	1	0·0	100·0
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	0·0	0·0	100·0	0·0	100·0	...	..	...	...

SOUTH-EASTERN HOSPITAL.

Ages.	Cases.						Total.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.
1 to 2 ...	2	...	...	...	1	3	2	1
2 ,, 3 ...	1	...	2	...	...	3	1	2
3 ,, 4 ...	2	...	...	...	...	2	2	...
4 ,, 5 ...	1	1	1	...	...	3	2	1
5 ,, 10 ...	3	1	...	...	...	4	4	...
10 ,, 15 ...	2	...	...	...	...	2	2	...
20 and upwards	1	...	...	...	...	1	1	...
Total ...	12	2	3	...	1	18	14	4

No Deaths.

TABLE IIa. showing the site of affection in those cases in which Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

1894.

FOUNTAIN HOSPITAL.

Ages.	Cases.						Total.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.
4 to 5 ...	...	1	...	...	...	1	1	...
5 ,, 10 ...	1	...	...	...	...	1	1	...
10 ,, 15 ...	2	...	...	...	...	2	2	...
15 ,, [illegible] ...	2	...	...	...	...	2	2	...
Total ...	5	1	...	...	...	6	6	...

No Deaths.

EASTERN HOSPITAL.

Ages.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Total: Faucial.	Total: Laryngeal.
4 to 5 ...	...	...	...	1	...	1	...	1
5 ,, 10 ...	1	1	...	...	...	2	2	...
10 ,, 15 ...	...	1	...	...	...	1	1	...
Total ...	1	2	...	1	...	4	3	1

No Deaths.

SOUTH-EASTERN HOSPITAL.

Ages.	Cases.						Total.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	
1 to 2 ...	...	1	..	...		1	1	..
2 ,, 3 ...	...	1	...	...	...	1	1	...
3 ,, 4 ...	*3	...	1	1	...	5	3	2
4 ,, 5 ...	1	...	...	..	...	1	1	...
5 ,, 10 ...	2	...	...	...	...	2	2	...
15 ,, 20 ...	1	...	...	...	...	1	1	...
Total ...	7	2	1	1	...	11	9	2
Mortality per cent.	16·6	...	...	...	...	...	...	...

* 1 case Died.

In the following hospitals the average number of days that cases (in which diphtheria bacilli were found and antitoxic serum was injected) remained in hospital were as follows:—

In the Fountain Hospital, four cases, all of which recovered, were in hospital on an average 107·5 days, one case (in which probably the onset of the disease was in the hospital) died, 99 days.

In the Eastern Hospital, one case died after being 138 days in hospital.

In the South-Eastern Hospital, eighteen cases, all of which recovered, were in hospital on an average 104·8 days.

In similar cases in which diphtheria bacilli were found but no antitoxic serum was injected there were:—

In the Fountain Hospital, six cases, all of which recovered, the average number of days in hospital being 90·1.

In the Eastern Hospital, four cases, which were sent out of hospital after being in an average of 98·5 days.

In the South-Eastern Hospital, ten cases recovered after remaining on an average 136·2 days in hospital; one died after being in hospital for 106 days.

The following is the percentage mortality at different ages in cases in which diphtheria bacilli were found, and in which tracheotomy was performed and antitoxic serum injected:—

In the Fountain Hospital there were two such cases, one between 4 and 5 years which recovered, one 5—10 years which died.

In the South-Eastern Hospital there was one case between 1 and 2 years, which recovered.

In similar cases, but in which no antitoxic serum was injected, there were:—

At the South-Eastern Hospital two cases were operated upon, both occurring between the ages of 3 and 4 years; one of them died.

TABLE IIIA. showing complications in cases treated with and without antitoxin.

1894.

Hospitals.	Albuminuria.		Vomiting.		Urine Scanty.		Anuria.		Adenitis.		Otitis.		Nephritis.		Suppurating Cellulitis.	
	Injected.	Not injected.	Injected.	Not injected.	Injected.	Not injected.	Injected.	Not injected.	Injected.	Not injected.	Injected.	Not injected.	Injected.	Not injected.	Injected.	Not injected.
Fountain	1	...	...	...	..	...	...	...	...	2	..	...	...	...	...	...
Eastern	1	1	1	1	...	...	...	1	...	1	..	..	...	1	...	...
South-Eastern	9	5	2	1	1	...	...	...	1	2	2	..		1	1	...
Total	11	6	3	2	1	...		1	1	5	2	...	...	2	1	...

PARALYSES.

At the Fountain Hospital there was one case of palatal paralysis, occurring in a child between 5 and 10 years. Here diphtheria bacilli were found, and antitoxin was injected, but the patient died.

At the South-Eastern Hospital there were three cases of ocular paralysis, two in cases between 2 and 3 years, and one 10—15 years; three cases of ocular and palatal paralysis, 2—3 years one, and 5—10 years two; and one case of general paralysis; all of these recovered.

Of similar cases in which no antitoxin was injected, there were in the South-Eastern Hospital, one case of ocular paralysis between 5—10 years; three cases of ocular and palatal paralysis; 1—2 years one, 2—3 years one, and 3—4 years one; this last ending fatally.

In this year there were two cases which were re-injected with antitoxin after a lapse of a period of at least fourteen days. One of these was in the Fountain Hospital, 5—10 years; the second, at the South-Eastern Hospital, 2—3 years; both recovered. Diphtheria bacilli were demonstrated in both cases.

In the Fountain Hospital three of the cases in which diphtheria bacilli were found, and which were treated with antitoxin, developed rashes; two of them an erythematous rash on the eighth and the tenth day, one a scarlet fever rash, which occurred on the ninth day.

In the Eastern Hospital there was only one rash, and this was not described; whilst in the South-Eastern Hospital there were three urticarial rashes, which appeared from the fourth to the fifteenth days, two erythematous rashes on the third and fourteenth days, one blotchy rash on the twenty-third day, two "antitoxic rashes" on the fourth and seventeenth days, and in one a rash not described, appearing on the twenty-seventh day. There were thus nine cases in all, or 50 per cent. of the cases in which diphtheria bacilli were found, and in which antitoxin was injected. In addition to the rashes above mentioned, there was one bright rash in a case in which no antitoxic serum was given, this rash making its appearance on the third day.

At the South-Eastern Hospital there was one case of punctiform erythematous rash, which appeared on the second day.

One case of bronchitis occurred in a patient in whose throat diphtheria bacilli were found. This patient, 1—2 years of age, was injected with antitoxic serum, and recovered.

A second and similar case, 3—4 years of age, developed broncho-pneumonia, and recovered.

In a large proportion of the cases examined during 1894 diphtheria bacilli were found on the last occasion on which a specimen was examined. At the Fountain Hospital three of these were treated with antitoxic serum, and four were not injected.

At the Eastern Hospital there were two which received no antitoxic serum, and at the South-Eastern six which were treated with antitoxic serum, and six without.

At this period none of the antitoxic serum was supplied from the Laboratories of the Colleges.

A certain number of the cases were sent into hospital certified as suffering from scarlet fever and diphtheria.

In all the following cases diphtheria bacilli were found.

At the Fountain Hospital there were two cases, both of which recovered.

At the Eastern Hospital, three cases, one of which recovered. There were five similar cases in which no antitoxic serum was given—four at the Fountain, and one at the Eastern; all of these recovered.

There were three cases certified as scarlet fever in which diphtheria bacilli were found and no antitoxic serum was given—one at the Fountain Hospital, two at the Eastern; all three recovered. Seven cases transferred to the Northern Hospital developed diphtheria, and diphtheria bacilli were found in the membrane; four of these were injected: all recovered; three were not injected: they also recovered.

Of the cases in which diphtheria bacilli were found and which were injected with antitoxic serum, two died—one in the Fountain Hospital, age 5—10 years, in which tracheotomy was performed, death being due to cardiac failure, after the child had been in hospital 99 days. The other death occurred at the Eastern Hospital, age 2 to 3 years; the note in this case was "croupy otorrhœa," time in hospital 133 days. Another case in which diphtheria bacilli were found, which resulted in death, occurred at the South-Eastern Hospital. This was not treated with antitoxic serum. The child, aged three years, suffered from paralysis of the palate and severe diarrhœa; it was 106 days in hospital.

DETAILS OF CASES ADMITTED DURING THE YEARS 1895 AND 1896.

TABLE IVA.—Percentage Mortality, at different ages, of all cases that have been bacteriologically examined, and in which Diphtheria bacilli were found. Day of disease taken from Ambulance Nurses' Report.

1895.

Day of Disease	1		2		3		4		5		6		7		8 and upwards.		No history.		Total.		Mortality per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
FOUNTAIN HOSPITAL.																					
Under 1	1	1	3	1	...	...	...	..	1	...	2	1	1	...	2	1	...	...	10	4	40·0
1 to 2...	1	...	10	2	4	1	9	5	4	2	3	...	1	...	4	2	1	1	37	13	35·1
2 ,, 3...	1	...	12	2	10	2	12	3	9	4	6	2	3	3	6	4	2	1	61	21	34·4
3 ,, 4...	5	1	16	3	15	6	9	6	10	3	8	3	5	3	7	3	1	...	76	28	36·8
4 ,, 5...	1	...	19	3	15	2	15	3	12	1	7	...	6	...	10	1	1	...	86	10	11·6
5 ,, 10...	4	...	40	2	62	11	46	8	28	6	26	8	13	1	31	3	6	...	256	39	15·2
10 ,, 15...	3	...	11	...	26	...	22	3	7	1	7	...	5	...	12	...	1	...	94	4	4·2
15 ,, 20...	...	...	2	...	4	1	12	1	6	...	5	1	1	...	3	1	2	...	35	4	11·4
20 and upwards ...	...	...	6	...	6	...	3	1	7	...	1	...	3	1	6	...	...	...	32	2	6·2
Total	16	2	119	13	142	23	128	30	84	17	65	15	38	8	81	15	14	2	687	125	...
Mortality per cent.	...	12·5	..	10·9	...	16·1	...	23·4	..	20·2	...	23·07	...	21·05	...	18·5	...	14·2	...	18·1	...
WESTERN HOSPITAL.																					
Under 1...	...	...	...	...	2	...	3	...	...	...	2	1	...	...	3	1	...	...	10	2	20·0
1 to 2...	2	..	5	3	8	3	3	2	7	3	2	2	2	...	3	2	...	...	32	15	46·8
2 ,, 3...	2	...	12	1	7	1	13	6	5	...	4	2	1	...	6	2	...	...	50	12	24·0
3 ,, 4...	2	...	13	1	19	7	14	7	14	4	10	3	4	2	12	3	1	...	89	27	30·3
4 ,, 5...	1	...	13	2	14	4	18	6	16	4	12	6	1	...	7	2	1	...	83	24	28·9
5 ,, 10	9	...	29	4	40	8	46	13	34	5	16	2	15	3	18	5	...	...	207	40	19·3
10 ,, 15...	...	...	9	...	19	1	15	2	7	1	6	1	3	1	4	...	...	...	63	6	9·3
15 ,, 20...	...	...	...	...	4	...	3	1	2	...	5	1	...	..	4	1	...	...	18	3	16·6
20 and upwards ...	2	...	6	...	9	...	12	...	12	1	3	...	2	...	3	...	...	...	49	1	2·04
Total	18	...	87	11	122	24	127	37	97	18	60	18	28	6	60	16	2	...	601	130	..
Mortality per cent.	...	0·0	...	12·6	...	19·6	...	29·1	...	18·5	...	30·0	...	21·4	...	26·6	...	0·0	...	21·6	..
EASTERN HOSPITAL.																					
Under 1	1	1	4	4	...	...	1	...	...	...	1	1	...	...	...	...	...	...	7	6	85·7
1 to 2...	6	4	5	3	9	7	9	7	6	3	1	...	1	...	7	4	...	...	44	28	63·6
2 ,, 3...	5	3	11	1	12	6	13	6	7	2	5	2	1	1	7	1	...	...	61	22	36·06
3 ,, 4...	5	3	14	3	14	5	17	6	12	4	9	4	3	...	11	3	...	...	85	28	32·9
4 ,, 5...	5	1	19	3	16	9	10	5	10	2	8	4	3	1	20	5	...	...	91	30	32·9
5 ,, 10...	13	3	44	9	54	15	43	6	38	9	15	5	18	5	25	8	1	...	251	60	23·9
10 ,, 15...	1	...	22	3	25	1	18	1	11	3	12	1	7	...	10	1	...	...	106	10	9·4
15 ,, 20...	1	...	7	1	6	...	6	...	5	...	2	...	1	..	2	...	1	...	31	1	3·2
20 and upwards ...	2	...	8	...	6	...	6	...	2	...	4	...	2	...	2	...	...	...	32	...	0·0
Total	39	15	134	27	142	43	123	31	91	23	57	17	36	7	84	22	2	...	708	185	...
Mortality per cent.	..	38·4	...	20·1	...	30·2	...	25·2	...	25·2	...	29·8	...	19·4	...	26·1	...	0·0	...	26·1	...

TABLE IVA. *(continued)*.—Percentage Mortality, at different ages, of all cases that have been bacteriologically examined, and in which Diphtheria bacilli were found. Day of disease taken from Ambulance Nurses' Report.

1895.

SOUTH-EASTERN HOSPITAL.

Day of Disease	1		2		3		4		5		6		7		8 and upwards.		No history.		Total.		Mortality per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	3	2	3	1	1	...	1	...	...	...	...	...	...	...	...	...	8	3	37·5
1 to 2...	1	...	7	2	6	4	4	3	3	...	3	2	2	1	6	2	...	...	32	14	43·7
2 ,, 3...	2	...	11	4	4	...	8	5	7	2	5	...	4	2	7	2	...	...	48	15	31·2
3 ,, 4...	2	...	7	1	9	1	10	2	7	2	3	1	4	1	8	3	...	...	50	11	22·0
4 ,, 5...	1	...	19	1	18	4	12	4	6	5	1	1	6	2	6	1	...	...	69	18	26·08
5 ,, 10...	6	...	42	4	39	9	32	11	35	8	22	5	11	5	16	...	...	...	203	42	20·6
10 ,, 15...	4	...	15	2	15	1	8	2	7	...	6	...	1	1	8	...	...	...	64	6	9·3
15 ,, 20...	1	...	1	...	4	...	7	...	...	...	2	...	1	...	2	...	...	...	18	...	0·0
20 and upwards ...	...	...	6	...	2	...	7	...	2	...	2	...	...	...	3	...	...	...	22	...	0·0
Total	17	...	111	16	100	20	89	27	68	17	44	9	29	12	56	8	...	...	514	109	...
Mortality per cent.	...	0·0	...	14·4	...	20·0	...	30·3	...	25·0	...	20·4	...	41·3	...	14·2	...	0·0	...	21·2	...

SOUTH-WESTERN HOSPITAL.

Ages	1 Cases	1 Deaths	2 Cases	2 Deaths	3 Cases	3 Deaths	4 Cases	4 Deaths	5 Cases	5 Deaths	6 Cases	6 Deaths	7 Cases	7 Deaths	8 and upwards Cases	8 and upwards Deaths	No history Cases	No history Deaths	Total Cases	Total Deaths	Mortality per cent.
Under 1	...	...	2	...	3	2	1	...	...	...	1	1	...	...	...	...	...	...	7	3	42·8
1 to 2	4	2	4	...	3	1	3	3	2	2	5	3	1	...	4	3	1	...	27	14	51·8
2 ,, 3	2	...	3	...	9	8	8	3	5	2	2	...	1	...	2	1	...	...	32	14	43·7
3 ,, 4	...	...	7	...	9	2	9	1	7	2	4	3	4	...	3	1	...	...	43	9	20·9
4 ,, 5	2	...	7	2	10	2	15	6	6	3	3	2	3	1	8	4	...	...	54	20	37·03
5 ,, 10	9	...	31	2	32	3	43	7	34	7	21	8	4	...	14	2	...	...	188	29	15·4
10 ,, 15	2	...	11	1	4	1	21	...	7	1	9	4	2	...	2	...	...	...	58	7	12·06
15 ,, 20	...	...	6	...	1	...	4	...	2	...	1	...	...	...	2	1	...	...	16	1	6·2
20 and upwards ...	2		2	...	3	...	5	1	4	...	2	...	1	1	...	...	...	...	19	2	10·5
Total	21	2	73	5	74	19	109	21	67	17	48	21	16	2	35	12	1	...	444	99	...
Mortality per cent.	...	9·5	...	6·8	...	25·6	...	19·2	...	25·3	...	43·7	...	12·5	...	34·2	...	0·0	...	22·2	...

NORTH-WESTERN HOSPITAL.

Ages	1 Cases	1 Deaths	2 Cases	2 Deaths	3 Cases	3 Deaths	4 Cases	4 Deaths	5 Cases	5 Deaths	6 Cases	6 Deaths	7 Cases	7 Deaths	8 and upwards Cases	8 and upwards Deaths	No history Cases	No history Deaths	Total Cases	Total Deaths	Mortality per cent.
Under 1	1	...	5	1	2	1	...	...	...		1	...	...	...	3	2	..	...	12	4	33·3
1 to 2	...	..	13	7	7	4	6	5	7	2	6	2	3	2	5	4	2	1	49	27	55·1
2 ,, 3	1	1	10	...	12	6	9	3	4	3	4	1	5	...	10	5	1	...	56	19	33·9
3 ,, 4	2	1	13	2	20	5	22	10	12	2	12	5	5	2	7	4	2	1	95	32	33·6
4 ,, 5	1	...	14	5	11	3	13	3	5	2	10	5	3	2	10	3	...	...	67	23	34·3
5 ,, 10	7	...	46	5	53	15	38	4	28	2	28	7	8	3	22	5	1	...	231	41	17·7
10 ,, 15	1	...	10	2	12	1	14	...	9	2	3	1	3	1	7	1	...	...	59	8	13·5
15 ,, 20	...	...	4	1	5	...	2	1	1	...	1	...	2	...	1	...	1	...	17	2	11·7
20 and upwards ...	...	...	7	...	7	1	9	...	3	...	5	..	1	...	3	...	...	...	35	1	2·8
Total	13	2	122	23	129	36	113	26	69	13	70	21	30	10	68	24	7	2	621	157	...
Mortality per cent.	...	15·3	...	18·8	...	27·9	...	23·0	...	18·8	...	30·0	...	33·3	...	35·2	...	28·5	...	25·2	...

NORTH-EASTERN HOSPITAL.

Ages	1 Cases	1 Deaths	2 Cases	2 Deaths	3 Cases	3 Deaths	4 Cases	4 Deaths	5 Cases	5 Deaths	6 Cases	6 Deaths	7 Cases	7 Deaths	8 and upwards Cases	8 and upwards Deaths	No history Cases	No history Deaths	Total Cases	Total Deaths	Mortality per cent.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	0·0
1 to 2	...	...	1	...	2	1	...	. .	...	...	...	...	...	...	...	...	...	...	3	1	33·3
2 ,, 3	1	...	6	4	2	1	1	1	...	...	...	...	1	1	2	...	...	...	13	7	53·8
3 ,, 4	...	...	1	1	2	1	2	...	1	...	3	...	...	...	1	...	...	...	10	2	20·0
4 ,, 5	2	...	1	1	1	...	1	...	...	...	1	...	...	...	...	...	...	...	6	1	16·6
5 ,, 10	1	...	5	...	6	...	1	...	5	2	...	...	...	...	...	...	...		18	2	11·1
10 ,, 15	2	...	4	...		...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	0·0
20 and upwards ...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0
Total	6	...	18	6	15	3	5	1	6	2	4	...	1	1	3	...	...	...	58	13	...
Mortality per cent.	...	0·0	...	33·3	...	20·0	...	20·0	...	33·3	...	0·0	...	100·0	...	0·0	...	0·0	...	22·4	...

NORTHERN HOSPITAL.

Ages	1 Cases	1 Deaths	2 Cases	2 Deaths	3 Cases	3 Deaths	4 Cases	4 Deaths	5 Cases	5 Deaths	6 Cases	6 Deaths	7 Cases	7 Deaths	8 and upwards Cases	8 and upwards Deaths	No history Cases	No history Deaths	Total Cases	Total Deaths	Mortality per cent.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
2 ,, 3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0
3 ,, 4	22	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22	1	4·5
4 ,, 5	29	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29	2	6·8
5 ,, 10	92	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	92	3	3·2
10 ,, 15	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	32	...	0·0
15 ,, 20	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	0·0
20 and upwards ...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	0·0
Total	191	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	191	6	...
Mortality per cent.	...	3·1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3·1	...

TABLE IVA. (*continued*).—Percentage Mortality, at different ages, of all cases that have been bacteriologically examined, and in which Diphtheria bacilli were found. Day of disease taken from Ambulance Nurses' Report.

1896.

FOUNTAIN HOSPITAL.

Day of Disease	1		2		3		4		5		6		7		8 and upwards.		Total.		Mortality per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	1	...	2	2	1	1	1	...	...	...	...	...	...	...	...	...	5	3	60·0
1 to 2	1	1	11	3	9	3	9	8	11	7	1	1	...	...	5	3	47	26	55·3
2 ,, 3	1	...	16	3	13	4	11	2	9	5	8	1	4	1	1	...	63	16	25·3
3 ,, 4	2	1	24	5	28	6	20	8	15	4	15	4	6	1	11	4	121	33	27·2
4 ,, 5	1	...	21	2	21	4	24	6	28	5	9	3	3	1	15	4	122	25	20·4
5 ,, 10	9	1	69	6	83	10	73	15	55	9	45	8	30	6	38	6	402	61	15·1
10 ,, 15	1	...	15	1	25	...	26	3	14	...	15	2	4	...	11	...	111	6	5·4
15 ,, 20	...	...	8	...	5	...	5	...	6	...	3	...	1	...	1	...	29	...	0·0
20 and upwards...	...	...	8	...	14	...	11	...	5	...	5	1	...	...	1	...	44	1	2·2
Total	16	3	174	22	199	28	180	42	143	30	101	20	48	9	83	17	944	171	...
Mortality per cent.	...	18·7	...	12·6	...	14·07	...	23·3	...	20·9	...	19·8	...	18·7	...	20·4	...	18·1	...

WESTERN HOSPITAL.

Under 1	1	...	2	1	3	2	3	...	2	...	1	1	1	1	1	1	14	6	42·8
1 to 2	...	...	10	6	16	7	12	5	5	1	5	2	1	1	4	1	53	23	43·3
2 ,, 3	5	1	19	9	21	8	16	6	14	2	5	2	5	3	7	1	92	32	34·7
3 ,, 4	4	1	16	2	28	5	16	4	18	4	15	4	10	3	8	1	115	24	20·8
4 ,, 5	2	...	17	3	30	10	20	7	18	7	8	1	8	2	14	3	117	33	28·2
5 ,, 10	7	...	47	2	63	6	53	6	34	6	32	8	17	4	39	8	292	40	13·6
10 ,, 15	2	...	11	...	16	2	20	4	18	2	10	...	5	...	9	2	91	10	10·9
15 ,, 20	2	..	2	...	12	...	3	...	8	2	2	...	3	...	3	1	35	3	8·5
20 and upwards...	...	...	10	...	14	...	20	...	8	...	8	...	4	...	11	...	75	...	0·0
Total	23	2	134	23	203	40	163	32	125	24	86	18	54	14	96	18	884	171	...
Mortality per cent.	...	8·6	...	17·1	...	19·7	...	19·6	...	19·2	...	20·9	...	25·9	...	18·7	...	19·3	...

EASTERN HOSPITAL.

Under 1	1	...	4	1	...	...	1	...	...	...	...	...	1	...	3	2	10	3	30·0
1 to 2	1	...	4	1	7	...	4	...	6	1	2	1	2	...	5	3	31	6	19·3
2 ,, 3	1	...	12	2	8	3	12	3	10	3	6	1	3	1	8	3	60	16	26·6
3 ,, 4	1	...	19	2	15	2	25	5	12	2	8	5	3	...	15	4	98	20	20·4
4 ,, 5	2	1	15	3	15	2	25	6	13	5	14	1	4	2	9	1	97	21	21·6
5 ,, 10	12	1	39	1	53	13	46	3	40	4	25	6	18	5	47	4	280	37	13·2
10 ,, 15	2	...	13	...	16	...	17	2	22	4	11	...	6	...	10	...	97	6	6·1
15 ,, 20	...	...	1	...	4	...	2	...	1	...	...	...	1	...	1	...	10	...	0·0
20 and upwards...	...	...	4	...	15	...	6	...	4	...	7	...	1	...	5	...	42	...	0·0
Total	20	2	111	10	133	20	138	19	108	19	73	14	39	8	103	17	725	109	...
Mortality per cent.	...	10·0	...	9·01	...	15·03	...	13·7	...	17·5	...	19·1	...	20·5	...	16·5	...	15·03	...

SOUTH-EASTERN HOSPITAL.

Under 1	1	...	2	1	6	1	3	3	2	1	...	...	2	2	4	1	20	9	45·0
1 to 2	...	...	5	2	16	11	5	1	3	1	6	3	1	...	4	1	40	19	47·5
2 ,, 3	3	2	7	1	12	3	14	7	14	2	11	3	3	...	8	3	72	21	29·1
3 ,, 4	1	...	21	3	15	4	14	4	10	1	12	6	4	1	12	4	89	23	25·8
4 ,, 5	2	...	17	...	24	4	16	2	11	2	8	2	12	2	14	3	104	15	14·4
5 ,, 10	4	...	38	4	45	2	60	9	29	8	29	4	20	7	27	3	252	37	14·6
10 ,, 15	1	...	8	...	14	1	12	...	11	3	6	...	4	1	11	2	67	7	10·4
15 ,, 20	...	...	4	...	4	...	2	2	3	...	3	...	1	...	4	...	21	2	9·5
20 and upwards...	1	...	2	...	13	...	7	1	4	...	2	...	1	...	5	1	35	2	5·7
Total	13	2	104	11	149	26	133	29	87	18	77	18	48	13	89	18	700	135	...
Mortality per cent.	...	15·3	...	10·5	...	17·4	...	21·8	...	20·6	...	23·3	...	27·08	...	20.2	...	19·2	...

SOUTH-WESTERN HOSPITAL.

Under 1	1	...	1	...	3	2	1	..	2	...	1	...	1	1	...	...	10	3	30·0
1 to 2	...	...	3	1	4	1	1	1	2	1	2	1	...	...	3	2	15	7	46·6
2 ,, 3	...	...	7	...	8	2	3	3	5	...	1	1	1	...	2	2	27	8	29·6
3 ,, 4	2	...	9	...	3	...	9	2	4	1	6	2	2	...	2	1	37	6	16·2
4 ,, 5	1	...	2	...	11	5	8	...	9	3	6	1	2	...	7	...	46	9	19·5
5 ,, 10	6	...	42	...	44	7	47	13	33	7	16	5	15	3	21	5	224	40	17·8
10 ,, 15	1	...	14	2	13	...	20	1	5	1	8	...	7	...	7	1	75	5	6·6
15 ,, 20	...	...	1	...	3	...	7	...	5	1	2	...	...	...	...	...	18	1	5·5
20 and upwards	...	...	5	...	3	...	8	...	3	...	3	...	4	...	3	...	29	...	0·0
Total	11	...	84	3	92	17	104	20	68	14	45	10	32	4	45	11	481	79	...
Mortality per cent.	...	0·0	...	3·5	...	18·4	...	19·2	...	20·5	...	22·2	...	12·5	...	24·4	...	16·4	...

TABLE IVA. (*continued*).—Percentage Mortality, at different ages, of all cases that have bee bacteriologically examined, and in which Diphtheria bacilli were found. Day of disease taken from Ambulance Nurses' Report.

1896.

NORTH-WESTERN HOSPITAL.

Day of Disease	1		2		3		4		5		6		7		8 and upwards.		Total.		Mortality per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	1	1	1	1	2	...	3	1	...	...	1	...	...	...	8	3	37·5
1 to 2	1	1	5	4	9	4	9	5	6	1	3	3	3	3	2	2	38	23	60·5
2 ,, 3	4	2	11	3	12	4	16	6	11	3	13	7	6	3	6	2	79	30	37·9
3 ,, 4	...	...	9	2	20	7	20	9	17	6	15	5	10	2	12	3	103	34	33·009
4 ,, 5	...	...	19	4	16	7	25	6	22	11	14	5	4	3	14	4	114	40	35·08
5 ,, 10	3	...	29	4	52	11	69	17	55	18	28	6	24	8	35	12	295	75	25·4
10 ,, 15	2	...	8	1	12	...	10	...	13	1	5	1	8	1	8	...	66	4	6·06
15 ,, 20	...	...	...	...	4	...	3	...	4	...	1	...	...	...	...	...	12	...	0·0
20 and upwards...	...	...	...	...	5	...	5	...	...	...	3	...	1	...	2	...	16	...	0·0
Total	10	3	82	19	131	34	159	43	131	41	82	27	57	20	79	22	731	209	...
Mortality per cent.	...	30·0	...	23·1	...	25·9	...	27·04	...	31·2	...	32·9	...	35·08	...	27·8	...	28·5	...

NORTH-EASTERN HOSPITAL.

Ages.	1 Cases.	1 Deaths.	2 Cases.	2 Deaths.	3 Cases.	3 Deaths.	4 Cases.	4 Deaths.	5 Cases.	5 Deaths.	6 Cases.	6 Deaths.	7 Cases.	7 Deaths.	8 and upwards Cases.	8 and upwards Deaths.	Total Cases.	Total Deaths.	Mortality per cent.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	...	...	...	...	1	...	1	...	1	1	...	...	...	...	...	...	3	1	33·3
2 ,, 3	...	...	1	...	...	...	...	...	1	...	2	1	...	...	2	...	6	1	16·6
3 ,, 4	...	...	...	...	2	...	...	...	1	...	...	...	...	...	1	...	4	...	0·0
4 ,, 5	...	...	1	...	1	...	1	...	4	1	...	...	1	...	...	...	8	1	12·5
5 ,, 10	...	...	2	...	3	3	3	1	1	...	1	1	...	...	4	...	14	5	35·7
10 ,, 15	...	...	1	...	2	...	1	...	2	...	...	...	1	1	...	...	7	1	14·2
15 ,, 20	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	2	...	0·0
20 and upwards...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	2	...	3	...	0·0
Total	...	...	5	...	10	3	6	1	11	2	4	2	2	1	9	0	47	9	...
Mortality per cent.	...	0·0	...	0·0	...	30·0	...	16·6	...	18·1	...	50·0	...	50·0	...	0·0	...	19·1	...

BROOK HOSPITAL.

Ages.	1 Cases.	1 Deaths.	2 Cases.	2 Deaths.	3 Cases.	3 Deaths.	4 Cases.	4 Deaths.	5 Cases.	5 Deaths.	6 Cases.	6 Deaths.	7 Cases.	7 Deaths.	8 and upwards Cases.	8 and upwards Deaths.	Total Cases.	Total Deaths.	Mortality per cent.
Under 1	...	...	2	1	...	...	...	...	2	...	2	...	...	...	1	...	7	1	14·2
1 to 2	...	...	2	...	3	1	5	2	...	...	1	...	1	1	2	2	14	6	42·8
2 ,, 3	...	...	1	...	4	...	3	...	1	1	1	...	1	...	4	1	15	2	13·3
3 ,, 4	1	...	5	...	8	...	3	1	4	1	7	3	1	...	1	...	30	5	16·6
4 ,, 5	...	...	3	1	4	3	6	1	8	3	3	...	2	1	3	...	29	9	31·03
5 ,, 10	6	3	17	2	16	4	16	...	17	2	5	1	6	1	11	4	94	17	18·08
10 ,, 15	...	...	3	...	8	...	3	...	2	...	3	1	1	...	1	...	21	1	4·7
15 ,, 20	...	...	...	...	2	...	1	...	2	...	1	...	...	...	...	...	6	...	0·0
20 and upwards...	...	...	...	...	...	...	3	...	...	...	3	...	...	...	2	...	8	...	0·0
Total	7	3	33	4	45	8	40	4	36	7	26	5	12	3	25	7	224	41	...
Mortality per cent.	...	42·8	...	12·1	...	17·7	...	10·0	...	19·4	...	19·2	...	25·0	...	28·0	...	18·3	...

NORTHERN HOSPITAL.

Ages.	1 Cases.	1 Deaths.	2 Cases.	2 Deaths.	3 Cases.	3 Deaths.	4 Cases.	4 Deaths.	5 Cases.	5 Deaths.	6 Cases.	6 Deaths.	7 Cases.	7 Deaths.	8 and upwards Cases.	8 and upwards Deaths.	Total Cases.	Total Deaths.	Mortality per cent.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
2 ,, 3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
3 ,, 4	33	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	33	1	3·03
4 ,, 5	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	25	...	0·0
5 ,, 10	129	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	129	3	2·3
10 ,, 15	47	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	47	...	0·0
15 ,, 20	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	...	0·0
20 and upwards...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0
Total	251	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	251	4	...
Mortality per cent.	...	1·5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·5	...

GORE FARM HOSPITAL.

Ages.	1 Cases.	1 Deaths.	2 Cases.	2 Deaths.	3 Cases.	3 Deaths.	4 Cases.	4 Deaths.	5 Cases.	5 Deaths.	6 Cases.	6 Deaths.	7 Cases.	7 Deaths.	8 and upwards Cases.	8 and upwards Deaths.	Total Cases.	Total Deaths.	Mortality per cent.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
3 ,, 4	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	0·0
4 ,, 5	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	...	0·0
5 ,, 10	46	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	46	...	0·0
10 ,, 15	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20	...	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
20 and upwards...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
Total	81	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	81	...	...
Mortality per cent.	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...

Table Va.—Percentage Mortality, at different ages, of all cases that have been bacteriologically examined, and in which no Diphtheria bacilli were found. Day of disease taken from Ambulance Nurses' Report.

1895.

Day of Disease ...	1		2		3		4		5		6		7		8 and upwards.		No history.		?		Total.		Mortality per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
FOUNTAIN HOSPITAL.																							
Under 1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	3	1	33·3
1 to 2	1	...	...	...	1	...	1	1	3	1	1	1	...	...	3	1	...	...	...	...	10	4	40·0
2 ,, 3	1	...	4	3	2	...	2	...	...	...	1	...	2	...	3	...	...	...	...	...	15	3	20·0
3 ,, 4	1	...	1	...	1	...	3	1	2	2	2	...	...	...	4	1	...	...	...	...	14	4	28·5
4 ,, 5	1	..	8	...	5	...	5	2	1	...	1	...	...	...	4	...	...	...	...	...	25	2	8·0
5 ,, 10	3	...	19	2	11	1	15	...	4	...	8	1	4	...	8	2	1	...	...	...	73	6	8·2
10 ,, 15	...	...	12	...	10	...	9	...	7	...	2	...	...	...	6	...	...	...	...	...	46	...	0·0
15 ,, 20	1	...	3	...	3	...	8	...	1	...	2	...	...	...	1	...	...	...	...	...	19	...	0·0
20 and upwards	...	...	4	...	10	...	10	...	6	1	3	...	4	...	1	...	...	...	...	...	38	1	2·6
Total	8	...	51	5	44	1	53	4	24	4	20	2	10	...	31	4	2	1	...	...	243	21	...
Mortality per cent.	...	0·0	...	9·8	...	2·2	...	7·5	...	16·6	...	10·0	...	0·0	...	12·9	...	50·0	...	0.0	...	8·6	...
WESTERN HOSPITAL.																							
Under 1	...	...	1	...	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	4	...	0·0
1 to 2	1	...	2	1	2	1	2	1	...	...	1	...	..	...	5	...	...	...	...	...	13	3	23·07
2 ,, 3	...	...	...	...	3	...	6	...	4	2	...	...	2	...	2	...	...	...	...	...	17	2	11·7
3 ,, 4	1	...	1	1	3	...	3	1	2	2	3	...	2	1	3	1	...	...	...	...	18	6	33·3
4 ,, 5	...	...	2	...	3	1	1	...	...	...	3	1	...	...	2	...	...	...	...	...	11	2	18·1
5 ,, 10	2	...	7	...	10	...	13	...	14	2	6	1	1	...	5	...	1	...	...	...	59	3	5·08
10 ,, 15	2	...	4	...	9	...	10	...	3	...	5	...	...	...	4	...	...	...	...	...	37	...	0·0
15 ,, 20	...	...	2	...	3	...	5	...	1	...	2	...	1	...	3	...	...	...	...	...	17	...	0·0
20 and upwards	...	...	10	1	15	...	19	...	7	2	3	...	1	...	6	...	...	...	...	...	61	3	4·9
Total	6	...	29	3	49	2	59	2	31	8	25	2	7	1	30	1	1	...	...	...	237	19	...
Mortality per cent.	...	0·0	...	10·3	...	4·08	...	3·3	...	25·8	...	8·0	...	14·2	...	3·3	...	0·0	...	0·0	...	8·01	...
EASTERN HOSPITAL.																							
Under 1	...	...	1	1	...	...	1	1	1	1	1	1	2	2	1	1	...	...	1	...	8	7	87·5
1 to 2	...	...	3	1	4	3	2	2	1	1	1	...	3	1	2	2	...	...	1	...	17	10	58·8
2 ,, 3	...	...	5	...	4	1	3	1	1	...	1	...	2	...	4	2	...	...	1	1	21	5	23·8
3 ,, 4	2	...	3	...	3	1	5	1	1	1	2	...	...	...	6	1	...	...	1	...	23	4	17·3
4 ,, 5	1	...	2	1	4	1	5	...	1	...	...	...	1	1	2	...	...	...	2	1	18	4	22·2
5 ,, 10	5	...	21	...	20	2	11	2	9	...	6	2	4	...	15	1	...	...	1	...	92	7	7·6
10 ,, 15	3	...	10	...	10	...	15	1	3	...	8	...	3	...	9	1	...	...	1	...	62	2	3·2
15 ,, 20	1	...	5	...	10	...	3	...	3	...	2	1	5	...	4	1	...	...	2	...	35	2	5·7
20 and upwards	2	...	2	...	11	...	13	...	6	...	4	...	...	...	5	...	...	...	3	...	46	0	0·0
Total	14	...	52	3	66	8	58	8	26	3	25	4	20	4	48	9	...	...	13	2	322	41	...
Mortality per cent.	...	0·0	...	5·7	...	12·1	...	13·7	...	11·5	...	16·0	...	20·0	...	18·7	...	0·0	...	15·3	...	12·7	...
SOUTH-EASTERN HOSPITAL.																							
Under 1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	2	1	50·0
1 to 2	1	...	...	...	4	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	7	...	0·0
2 ,, 3	...	...	2	...	2	1	1	...	3	2	...	...	1	...	...	...	...	...	...	...	9	3	33·3
3 ,, 4	3	1	2	...	2	1	2	...	5	2	4	2	1	...	4	...	...	...	1	...	24	6	25·0
4 ,, 5	3	1	3	1	3	1	1	...	2	...	2	...	...	...	2	...	...	...	1	...	17	3	17·6
5 ,, 10	4	...	13	1	13	1	10	1	7	1	4	...	2	...	6	...	...	...	2	...	61	4	6·5
10 ,, 15	...	...	17	1	10	1	3	1	3	...	1	1	3	...	4	...	...	...	...	...	41	4	9·7
15 ,, 20	...	...	6	...	5	...	5	...	3	...	2	...	1	...	...	...	...	...	...	...	22	...	0·0
20 and upwards	...	...	7	...	9	...	5	...	4	...	4	...	2	...	6	...	...	...	...	...	37	...	0·0
Total	11	2	51	3	48	5	27	2	27	5	19	3	10	...	23	1	...	...	4	...	220	21	...
Mortality per cent.	...	18·1	...	5·8	...	10·4	...	7·4	...	18·5	...	15·7	...	0·0	...	4·3	...	0·0	...	0·0	...	9·5	...
SOUTH-WESTERN HOSPITAL.																							
Under 1	...	...	2	1	...	..	1	...	...	...	...	..	...	...	2	2	...	...	...	...	5	3	60·0
1 to 2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	..	...	2	...	0·0
2 ,, 3	...	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	3	...	0·0
3 ,, 4	1	1	1	...	2	...	3	...	3	2	1	...	1	1	3	...	...	..	...	...	15	4	26·6
4 ,, 5	...	...	2	...	1	...	1	...	1	...	...	...	...	...	1	1	...	...	...	...	6	1	16·6
5 ,, 10	1	...	3	1	6	1	5	...	6	1	5	1	1	...	6	...	1	...	...	...	34	4	11·7
10 ,, 15 ...	1	...	2	...	6	...	4	...	3	...	...	...	1	...	1	...	...	...	..	...	18	0	0·0
15 ,, 20	...	...	3	...	2	...	3	...	2	1	1	...	...	...	...	...	...	...	...	...	11	1	9·09
20 and upwards	...	...	1	...	4	...	4	...	5	...	4	...	2	...	1	...	...	...	...	...	21	...	0·0
Total	3	1	16	2	22	1	21	...	21	4	11	1	5	1	15	3	1	...	...	...	115	13	...
Mortality per cent.	...	33·3	...	12·5	...	4·5	...	0·0		19·04	...	9·09	...	20·0	...	20·0	..	0·0	...	0·0	...	11·3	...

TABLE Va. (*continued*).—Percentage Mortality, at different ages, of all cases that have been bacteriologically examined, and in which no Diphtheria bacilli were found. Day of disease taken from Ambulance Nurses' Report.

1895.

NORTH-WESTERN HOSPITAL.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No history.		?		Total.		Mortality per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	1	1	1	1	...	...	1	1	1	1	...	...	1	...	...	...	...	...	5	4	80·0
1 to 2	...	...	3	...	1	1	2	1	..	...	3	2	...	...	2	1	...	...	2	2	13	7	53·8
2 ,, 3	...	...	3	2	2	...	2	1	1	1	1	...	2	...	3	2	...	...	...	...	14	6	42·8
3 ,, 4	2	...	2	...	2	...	4	2	5	1	2	...	1	1	2	1	...	...	...	...	20	5	25·0
4 ,, 5	...	...	2	...	1	...	3	3	1	...	3	1	...	...	2	...	...	...	...	...	12	4	33·3
5 ,, 10	...	...	5	...	4	...	4	1	11	1	6	...	3	...	4	3	...	...	2	1	39	6	15·3
10 ,, 15	1	...	2	...	6	1	4	...	5	...	4	1	...	...	2	...	...	...	...	...	24	2	8·3
15 ,, 20	...	...	4	...	3	...	1	...	1	...	2	1	1	...	...	...	...	...	...	...	12	1	8·3
20 and upwards	...	...	2	...	13	1	5	1	4	...	2	...	1	...	6	...	...	...	1	...	34	2	5·8
Total	3	0	24	3	33	4	25	9	29	4	24	6	8	1	22	7	...	...	5	3	173	37	...
Mortality per cent.	...	0·0	...	12·5	...	12·1	...	36·0	...	13·7	...	25·0	...	12·5	...	31·8	...	0·0	...	60·0	...	21·3	...

NORTH-EASTERN HOSPITAL.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No history.		?		Total.		Mortality per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	2	...	0·0
1 to 2	..	...	2	...	1	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	6	...	0·0
2 ,, 3	...	...	2	1	1	...	2	...	...	...	...	...	...	...	2	...	...	...	...	...	7	1	14·2
3 ,, 4	1	...	2	...	2	...	4	...	...	...	...	...	1	...	1	...	...	...	...	...	11	...	0·0
4 ,, 5	1	...	2	...	6	1	2	...	2	1	...	...	...	...	2	2	...	...	...	...	15	4	26·6
5 ,, 10	2	...	10	2	7	...	5	1	3	...	2	...	1	...	2	1	...	...	...	...	32	4	12·5
10 ,, 15	3	...	4	...	2	...	2	...	2	...	1	...	...	...	2	...	...	...	...	...	16	...	0·0
15 ,, 20	...	...	1	...	1	...	1	...	1	...	1	...	1	...	...	...	...	...	...	...	6	...	0·0
20 and upwards	...	...	1	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	0·0
Total	7	0	24	3	21	1	19	1	11	1	4	...	3	...	10	3	...	...	...	...	99	9	...
Mortality per cent.	...	0·0	...	12·5	...	4·7	...	5·2	...	9·09	...	0·0	...	0·0	...	30·0	...	0·0	...	0·0	...	9·09	...

NORTHERN HOSPITAL.

Day of Disease.	1		2		3		4		5		6		7		8 and upwards.		No history.		?		Total.		Mortality per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
3 ,, 4	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	0·0
4 ,, 5	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	0·0
5 ,, 10	35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	35	...	0·0
10 ,, 15	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	0·0
15 ,, 20	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
20 and upwards	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	0·0
Total	62	0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	62	0	...
Mortality per cent.	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...

TABLE VA. (*continued*).—Percentage Mortality, at different ages, of all cases that have been bacteriologically examined, and in which no Diphtheria bacilli were found. Day of disease taken from Ambulance Nurses' Report.

1896.

Day of Disease ...	1		2		3		4		5		6		7		8 and upwards.		No history.		?		Total.		Mortality, per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
FOUNTAIN HOSPITAL.																							
Under 1	...	...	1	1	1	1	1	1	1	...	1	...	...	...	...	...	...	...	...	...	5	3	60·0
1 to 2	...	...	4	...	3	2	2	...	1	...	1	...	...	...	3	2	...	...	...	...	14	4	28·5
2 „ 3	2	...	2	1	7	2	2	...	3	...	3	2	3	...	1	...	1	...	...	...	24	5	20·8
3 „ 4	...	...	1	...	5	3	4	2	5	1	4	1	2	1	6	1	1	...	...	...	28	9	32·1
4 „ 5	2	1	2	...	5	1	8	1	2	1	4	...	3	...	5	2	1	1	...	...	32	7	21·8
5 „ 10	4	...	8	...	24	2	22	1	17	2	14	2	8	...	17	1	1	...	...	...	115	8	6·9
10 „ 15	...	...	13	...	11	...	15	1	6	1	8	...	2	...	4	...	1	...	...	...	60	2	3·3
15 „ 20	1	...	4	...	5	...	7	...	6	...	4	...	1	...	6	...	1	...	...	...	35	...	0·0
20 and upwards	2	...	4	...	11	...	8	...	8	...	1	...	4	...	6	...	...	...	...	...	44	...	0·0
Total	11	1	39	2	72	11	69	6	49	5	40	5	23	1	48	6	6	1	...	...	357	38	...
Mortality per cent.	...	9·09	...	5·1	...	15·2	...	8·6	...	10·2	...	12·5	...	4.3	...	12·5	...	16·6	...	0·0	...	10·6	...
WESTERN HOSPITAL.																							
Under 1	...	...	1	1	1	...	1	...	...	...	1	1	...	...	1	1	...	...	...	...	5	3	60·0
1 to 2	...	...	1	...	3	1	2	...	...	...	1	...	...	...	3	2	...	...	...	...	10	3	30·0
2 „ 3	1	...	2	1	5	...	7	2	3	1	...	...	...	...	4	3	...	...	...	...	22	7	31·8
3 „ 4	...	...	3	...	7	...	...	...	4	...	...	...	2	1	4	1	...	...	...	...	20	2	10·0
4 „ 5	1	...	3	1	4	...	3	...	4	1	3	1	3	...	5	...	...	...	...	...	26	3	11·5
5 „ 10	1	...	7	1	12	1	21	3	6	2	9	...	5	...	14	2	...	...	...	...	75	9	12·0
10 „ 15	...	...	5	...	8	...	12	...	8	...	5	...	1	...	6	...	...	...	...	...	45	...	0·0
15 „ 20	1	...	3	...	8	...	6	...	3	...	2	...	1	...	2	...	...	...	...	...	26	...	0·0
20 and upwards	1	...	11	...	10	1	11	...	5	...	5	...	7	1	8	1	...	...	...	...	58	3	5·1
Total	5	...	36	4	58	3	63	5	33	4	26	2	19	2	47	10	...	...	...	...	287	30	...
Mortality per cent.	...	0·0	...	11·1	...	5·1	...	7·9	...	12·1	...	7·6	...	10·5	...	21·2	...	0·0	...	0·0	...	10·4	...
EASTERN HOSPITAL.																							
Under 1	...	...	1	...	...	...	1	1	...	...	...	...	...	...	1	...	...	...	...	...	3	1	33·3
1 to 2	...	...	...	...	4	1	1	...	2	...	...	...	1	1	6	2	...	...	...	...	14	4	28·5
2 „ 3	...	...	...	...	4	3	6	1	5	1	3	1	4	...	1	...	...	...	...	...	23	6	26·08
3 „ 4	2	...	6	1	6	...	7	1	4	2	3	...	2	...	8	3	...	...	...	...	38	7	18·4
4 „ 5	...	...	1	...	4	2	6	1	3	1	3	...	4	1	11	2	...	...	...	...	32	7	21·8
5 „ 10	2	1	9	1	16	1	13	...	9	...	14	1	9	1	15	2	...	...	1	...	88	7	7·9
10 „ 15	10	1	6	...	5	...	8	...	7	1	8	...	2	...	8	...	...	...	1	...	55	2	3·6
15 „ 20	...	...	4	...	3	...	6	...	3	...	5	...	2	...	4	...	...	...	2	...	29	...	0·0
20 and upwards	...	...	7	1	4	...	9	...	7	...	5	...	5	...	5	...	...	...	...	...	42	1	2·3
Total	14	2	34	3	46	7	57	4	40	5	41	2	29	3	59	9	...	...	4	...	324	35	...
Mortality per cent.	...	14·2	...	8·8	...	15·2	...	7·01	...	12·5	...	4·8	...	10·3	...	15·2	...	0·0	...	0·0	...	10·8	...
SOUTH-EASTERN HOSPITAL.																							
Under 1	1	...	1	1	1	1	2	...	1	...	...	...	...	...	...	...	...	...	...	...	6	2	33·3
1 to 2	...	...	2	1	4	...	4	2	3	1	1	...	3	1	2	...	...	...	...	...	19	5	26·3
2 „ 3	...	...	3	1	1	1	3	...	2	1	2	...	1	...	6	...	...	...	...	...	18	3	16·6
3 „ 4	...	...	...	...	2	1	5	1	3	...	2	2	2	...	7	3	...	...	...	...	21	7	33·3
4 „ 5	...	...	4	...	5	1	2	...	7	...	3	1	3	2	5	1	...	...	...	...	29	5	17·2
5 „ 10	2	...	6	...	19	3	7	...	7	...	6	...	10	...	13	1	...	...	...	...	70	4	5·7
10 „ 15	1	...	2	...	6	...	6	1	8	1	6	...	4	1	8	1	...	...	...	...	41	4	9·7
15 „ 20	...	...	4	...	4	...	6	1	7	1	3	1	1	...	6	...	...	...	...	...	31	3	9·6
20 and upwards	...	...	5	...	2	...	8	...	8	...	5	...	2	...	8	1	1	...	...	...	39	1	2·5
Total	4	...	27	3	44	7	43	5	46	4	28	4	26	4	55	7	1	...	...	...	274	34	...
Mortality per cent	...	0·0	...	11·1	...	15·9	...	11·6	...	8·6	...	14·2	...	15·3	...	12·7	...	0·0	...	0·0	...	12·4	...
SOUTH-WESTERN HOSPITAL.																							
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	1	...	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	4	...	0·0
2 „ 3	1	1	1	...	1	1	1	...	3	1	...	...	...	...	3	1	...	...	...	...	10	4	40·0
3 „ 4	...	...	2	...	1	...	1	...	2	1	...	...	...	...	2	...	...	...	...	...	8	1	12·5
4 „ 5	...	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	0·0
5 „ 10	...	...	2	...	3	1	8	...	3	...	5	...	2	...	1	...	...	...	...	...	24	1	4·1
10 „ 15	...	...	3	...	10	1	7	...	2	...	2	...	1	...	5	1	...	...	...	...	30	2	6·6
15 „ 20	...	...	4	...	6	...	4	...	1	...	3	...	...	...	3	...	...	...	...	...	21	...	0·0
20 and upwards	...	...	3	...	9	...	2	...	8	...	4	1	1	...	6	...	...	...	...	...	33	1	3·03
Total	2	1	19	...	32	3	23	...	20	2	14	1	4	...	20	2	...	...	...	...	134	9	...
Mortality per cent.	...	50·0	...	0·0	...	9·3	...	0·0	...	10·0	...	7·1	...	0·0	...	10·0	...	...	...	...	...	6·7	...

TABLE VA. (*continued*).—Percentage Mortality, at different ages, of all cases that have been bacteriologically examined, and in which no Diphtheria bacilli were found. Day of disease taken from Ambulance Nurses' Report.

1896.

NORTH-WESTERN HOSPITAL.

Day of Disease ...	1		2		3		4		5		6		7		8 and upwards.		No history.		?		Total.		Mortality per cent.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	1	1	2	...	1	...	...	...	...	...	...	...	1	1	...	...	1	1	6	3	50·0
1 to 2	...	...	2	2	...	...	2	1	1	1	2	2	...	...	3	2	...	...	...	...	10	8	80·0
2 ,, 3	...	...	1	1	...	...	4	1	...	...	2	1	2	1	3	2	...	...	1	1	13	7	53·8
3 ,, 4	...	...	4	...	3	...	1	...	2	...	3	...	1	...	4	...	...	...	...	...	18	...	0·0
4 ,, 5	...	...	2	...	6	...	4	1	4	...	5	1	...	...	5	2	...	...	1	1	27	5	18·5
5 ,, 10	...	...	9	2	3	...	11	1	6	1	3	...	4	...	10	2	...	...	2	...	48	6	12·5
10 ,, 15	...	...	1	...	8	...	3	...	4	...	3	...	1	...	3	2	...	...	...	...	23	2	8·6
15 ,, 20	...	...	1	...	4	...	1	...	2	...	1	...	1	...	...	...	...	...	...	...	10	...	0·0
20 and upwards	1	...	4	...	4	...	7	...	7	...	1	...	4	...	1	...	...	...	1	...	30	...	0·0
Total	1	...	25	6	30	...	34	4	26	2	20	4	13	1	30	11	...	...	6	3	185	31	...
Mortality per cent.	...	0·0	...	24·0	...	0·0	...	11·7	...	7·6	...	20·0	...	7·6	...	36·6	...	0·0	...	50·0	...	16·7	...

NORTH-EASTERN HOSPITAL.

Under 1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
1 to 2	...	...	1	1	1	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	3	2	66·6
2 ,, 3 ...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	2	...	0·0
3 ,, 4	...	...	...	...	...	...	3	...	1	...	...	...	1	...	2	...	...	...	...	...	7	...	0·0
4 ,, 5	...	...	1	...	4	...	1	...	1	...	2	1	2	...	2	1	...	...	...	...	13	2	15·3
5 ,, 10	...	...	1	...	4	...	1	...	3	...	2	...	1	...	4	...	...	...	...	...	16	...	0·0
10 ,, 15	...	...	...	...	4	...	4	...	2	...	1	...	1	...	2	...	...	...	...	...	14	...	0·0
15 ,, 20	...	...	...	...	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	3	...	0·0
20 and upwards	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	2	...	0·0
Total	...	...	4	1	15	1	9	...	9	...	6	1	6	...	12	1	...	...	...	...	61	4	...
Mortality per cent.	...	0·0	...	25·0	...	6·6	...	0·0	...	0·0	...	16·6	...	0·0	...	8·3	...	0·0	...	0·0	...	6·5	...

BROOK HOSPITAL.

Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
2 ,, 3	...	...	2	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	3	1	33·3
3 ,, 4	...	...	1	...	2	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	5	1	20·0
4 ,, 5	...	...	1	...	...	...	2	1	1	...	...	...	1	...	...	...	...	...	...	...	5	1	20·0
5 ,, 10	1	...	3	...	4	...	1	...	2	1	1	...	...	...	4	...	...	...	...	...	16	1	6·2
10 ,, 15	...	...	2	...	...	...	2	...	1	...	1	...	1	1	1	...	...	...	...	...	8	1	12·5
15 ,, 20	...	...	...	...	3	...	3	...	2	...	...	...	...	...	1	...	...	...	...	...	9	...	0·0
20 and upwards	...	...	1	...	...	...	3	...	1	...	...	...	2	...	...	...	...	...	...	...	7	...	0·0
Total	1	...	10	...	9	...	11	1	8	1	3	1	5	2	7	...	...	...	...	...	54	5	...
Mortality per cent.	...	0·0	...	0·0	...	0·0	...	9·09	...	12·5	...	33·3	...	40·0	...	0·0	...	0·0	...	0·0	...	9·2	...

NORTHERN HOSPITAL.

Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
3 ,, 4	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	0·0
4 ,, 5	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	0·0
5 ,, 10	27	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	27	1	3·7
10 ,, 15	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	...	0·0
15 ,, 20	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	0·0
20 and upwards	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	0·0
Total	68	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	68	1	...
Mortality per cent.	...	1·4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·4	...

GORE FARM HOSPITAL.

Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
3 ,, 4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
4 ,, 5	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0
5 ,, 10	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	...	0·0
10 ,, 15	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
15 ,, 20	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0
20 and upwards	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0
Total	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20	...	...
Mortality per cent.	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...

TABLE VIA.—Percentage Mortality, at different ages, of cases in which Diphtheria bacilli were found, and in which Antitoxic Serum was injected. In the first line is given the day on which Antitoxic Serum was injected, reckoning this from the appearance of the initial symptoms as reported by the Ambulance Nurse.

1895.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage of total cases examined in which Diphtheria bacilli
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
FOUNTAIN HOSPITAL.																								
Under 1	...	...	1	1	...	...	...	...	1	...	1	1	1	...	...	...	...	...	...	...	4	2	50·0	40·0
1 to 2	...	...	6	1	1	1	8	2	1	...	3	...	...	...	2	2	1	1	...	..	17	7	41·1	45·9
2 ,, 3	...	...	5	1	5	2	4	...	6	2	4	1	...	...	4	4	2	1	...	...	30	11	36·6	49·1
3 ,, 4	4	1	4	...	11	4	4	2	5	3	2	1	1	...	5	4	5	1	1	...	42	16	38·09	55·2
4 ,, 5	...	...	5	1	11	1	7	2	4	...	4	...	2	..	6	1	5	...	3	2	47	7	14·8	54·6
5 ,, 10	1	...	14	2	13	5	21	5	23	4	12	6	4	1	12	4	3	...	1	1	104	28	26·9	40·6
10 ,, 15	...	...	5	...	3	...	10	1	8	1	2	...	2	...	1	...	...	...	...	...	31	2	6·4	32·9
15 ,, 20	...	...	...	...	3	1	1	...	2	1	...	...	...	...	...	...	...	...	...	...	6	2	33·3	17·1
20 and upwards...	...	...	1	...	1	...	...	...	1	...	...	...	2	...	1	...	...	...	...	...	6	...	0·0	18·7
Total	5	1	41	6	48	14	50	12	51	11	28	9	12	1	31	15	16	3	5	3	287	75	...	...
Mortality per cent.	...	20·0	...	14·6	...	29·1	..	24·0	...	21·5	...	32·1	...	8·3	...	48·3	...	18·7	...	60·0	...	26·1	...	41·7
WESTERN HOSPITAL.																								
Under 1	...	...	...	...	1	...	3	...	...	...	1	1	...	...	2	1	...	...	...	...	7	2	28·5	70·0
1 to 2	1	...	4	1	8	4	2	2	4	1	1	...	...	...	2	1	...	...	5	3	27	12	44·4	84·3
2 ,, 3	1	...	5	1	4	1	4	3	5	1	5	2	...	...	4	1	...	...	5	2	37	11	29·7	74·0
3 ,, 4	1	...	7	...	12	4	12	5	9	4	5	2	3	2	7	2	1	...	10	3	67	22	32·8	75·2
4 ,, 5	1	...	5	1	9	3	9	3	12	5	10	4	3	1	3	1	2	...	10	4	64	22	34·3	77·1
5 ,, 10	4	...	17	1	27	6	29	9	22	4	12	2	9	3	8	5	1	...	27	6	156	36	23·07	75·3
10 ,, 15	...	...	7	...	7	...	10	1	3	1	1	...	1	1	...	...	...	...	7	2	36	5	13·8	57·1
15 ,, 20	...	...	...	...	1	...	1	...	...	...	2	...	...	...	1	1	...	...	2	1	7	2	28·5	38·8
20 and upwards...	...	...	...	...	4	...	4	...	...	...	1	...	...	...	...	...	...	...	2	...	11	...	0·0	22·4
Total	8	...	49	4	73	18	74	23	55	16	38	11	16	7	27	12	4	...	68	21	412	112	...	...
Mortality per cent.	...	0·0	...	8·1	...	24·6	...	31·08	...	29·09	...	28·9	...	43·7	...	44·4	...	0·0	...	30·8	...	27·1	...	68·5
EASTERN HOSPITAL.																								
Under 1	...	...	2	2	...	...	1	1	...	...	1	1	...	...	...	...	...	...	...	...	4	4	100·0	57·1
1 to 2	3	3	6	5	2	2	6	4	4	1	2	1	2	2	6	2	3	...	...	...	34	20	58·8	77·2
2 ,, 3	1	...	3	...	5	1	6	3	3	1	1	...	1	...	2	...	4	2	...	...	26	7	35·0	42·6
3 ,, 4	1	1	6	1	8	3	6	2	6	4	10	3	3	...	5	2	4	...	1	...	50	16	32·0	58·8
4 ,, 5	1	1	8	1	6	5	8	5	2	1	1	...	3	3	9	1	4	...	...	...	42	17	40·4	46·1
5 ,, 10	3	1	13	3	22	6	19	4	17	4	7	4	10	4	11	4	9	2	...	...	111	32	28·9	44·2
10 ,, 15	...	...	8	2	6	...	4	1	2	1	2	...	2	...	4	2	2	...	...	...	30	6	20·0	28·1
15 ,, 20	...	...	1	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	4	...	0·0	12·9
20 and upwards...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	0·0	3·1
Total	9	6	47	14	50	17	51	20	34	12	25	9	21	9	38	11	26	4	1	...	302	102	...	...
Mortality per cent.	...	66·6	...	29·7	...	34·0	...	39·2	...	35·2	...	36·0	...	42·8	...	28·9	...	15·3	...	0·0	...	33·7	...	42·6
SOUTH-EASTERN HOSPITAL.																								
Under 1	...	...	1	...	4	2	...	...	1	...	...	...	1	1	...	...	...	...	...	...	7	3	42·8	87·5
1 to 2	1	...	5	1	6	4	5	3	1	...	3	1	2	2	4	2	1	...	...	...	28	13	46·4	87·5
2 ,, 3	1	...	6	1	6	1	6	3	7	3	4	...	3	1	6	2	3	1	...	...	42	12	28·5	87·5
3 ,, 4	2	...	6	1	8	1	7	2	4	1	7	2	3	...	4	3	1	...	...	...	42	10	23·8	84·0
4 ,, 5	1	...	13	...	14	5	13	5	7	4	2	1	3	2	6	1	1	...	...	...	60	18	30·0	86·9
5 ,, 10	4	...	27	3	31	6	31	9	27	9	17	3	15	6	9	1	8	...	...	...	169	37	21·8	83·2
10 ,, 15	4	1	8	...	13	1	10	2	3	...	5	1	1	1	4	...	2	...	...	...	50	6	12·0	78·1
15 ,, 20	...	...	1	...	3	...	5	...	...	...	...	...	2	...	2	...	...	...	...	...	13	...	0·0	72·2
20 and upwards...	...	...	3	...	1	...	3	...	1	...	1	...	...	...	...	...	...	...	...	...	9	...	0·0	40·9
Total	13	1	70	6	86	20	80	24	51	17	39	8	30	13	35	9	16	1	...	...	420	99	...	...
Mortality per cent.	...	7·6	...	8·5	...	23·2	...	30·0	...	33·3	...	20·5	...	43·3	...	25·7	...	6·2	...	0·0	...	23·5	...	81·7
SOUTH-WESTERN HOSPITAL.																								
Under 1	...	...	2	...	1	1	1	1	...	...	1	1	...	...	...	...	...	...	...	...	5	3	60·0	71·4
1 to 2	1	1	3	1	5	1	4	3	3	2	4	3	1	...	4	3	1	...	...	...	26	14	53·8	96·2
2 ,, 3	2	...	2	...	8	7	8	3	2	1	...	...	1	...	1	1	...	...	1	1	25	13	52·0	78·1
3 ,, 4 ..	1	...	6	...	5	1	6	1	6	3	4	2	3	...	2	...	...	...	...	...	33	7	21·2	76·7
4 ,, 5	1	...	6	2	7	2	12	6	5	2	3	2	1	1	8	4	...	...	1	...	44	19	43·1	81·4
5 ,, 10	4	...	22	2	23	2	24	6	25	7	16	8	3	...	14	2	...	...	...	...	131	27	20·6	69·6
10 ,, 15	1	...	5	1	2	1	13	..	3	1	5	2	...	...	1	1	...	...	...	...	30	6	20·0	51·7
15 ,, 20	...	...	2	...	...	...	...	...	...	...	1	...	...	...	1	1	...	...	...	...	4	1	25·0	25·0
20 and upwards..	...	...	...	...	1	...	3	1	...	...	...	...	1	1	...	...	...	...	...	...	5	2	40·0	26·3
Total	10	1	48	6	52	15	71	21	44	16	34	18	10	2	31	12	1	...	2	1	303	92	...	...
Mortality per cent.	...	10·0	...	12·5	...	28·8	...	29·5	...	36·3	...	52·9	...	20·0	...	38·7	...	0·0	...	50·0	...	30·3	...	68·2

TABLE VIA. (*continued*).—Percentage Mortality, at different ages, of cases in which Diptheria bacilli were found, and in which Antitoxic Serum was injected. In the first line is given the day on which Antitoxic Serum was injected, reckoning this from the appearance of the initial symptoms as reported by the Ambulance Nurse.

1895.

NORTH-WESTERN HOSPITAL.

ay of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage of total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
nder 1	...	...	4	1	1	1	...	...	...	...	1	...	...	...	2	2	...	...	...	...	8	4	50·0	66·6
1 to 2	...	...	9	4	5	4	4	3	4	1	4	2	3	2	2	2	...	...	...	...	31	18	58·06	63·2
2 ,, 3	...	...	4	1	6	2	5	2	1	1	1	1	1	...	3	1	...	...	...	...	21	8	38·09	37·5
3 ,, 4	1	...	7	1	12	5	11	4	4	3	7	3	3	2	...	...	...	...	1	...	46	18	39·1	48·4
4 ,, 5	1	...	6	1	5	4	7	3	3	1	4	2	...	...	4	2	...	...	...	...	30	13	43·3	44·7
5 ,, 10	3	...	22	3	20	6	15	1	7	1	15	4	2	1	9	3	...	...	...	...	93	19	20·4	40·2
0 ,, 15	1	...	4	...	3	1	4	...	4	2	4	1	2	1	2	...	...	...	...	...	24	5	20·8	40·6
5 ,, 20	...	...	1	1	2	...	2	1	...	...	...	...	1	...	1	...	...	...	...	...	7	2	28·5	41·1
0 and upwards ...	...	...	2	...	5	...	5	...	2	1	...	...	...	...	1	...	...	...	...	...	15	1	6·6	42·8
Total	6	...	59	12	59	23	53	14	25	10	36	13	12	6	24	10	...	...	1	...	275	88	...	...
ortality per cent.	...	0·0	...	20·3	...	38·9	...	26·4	...	40·0	...	36·1	...	50·0	...	41·6	...	0·0	...	0·0	...	32·0	...	44·2

NORTHERN HOSPITAL.

nder 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	11	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	1	9·09	50·0
4 ,, 5	10	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	2	20·0	34·4
5 ,, 10	29	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29	2	6·8	31·5
0 ,, 15	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	...	0·0	40·6
5 ,, 20	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	0·0	30·0
0 and upwards ...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	0·0	75·0
Total	69	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	69	5	...	...
ortality per cent.	...	7·2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7·2	...	36·1

TABLE VIA. (*continued*).—Percentage Mortality, at different ages, of cases in which Diphtheria bacilli were found, and in which Antitoxic Serum was injected. In the first line is given the day on which Antitoxic Serum was injected, reckoning this from the appearance of the initial symptoms as reported by the Ambulance Nurse.

1896.

FOUNTAIN HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage of total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	20·0
1 to 2	...	...	6	1	3	...	11	9	7	3	...	...	1	1	3	3	1	...	3	2	35	19	54·2	74·4
2 ,, 3	...	...	9	2	10	3	7	2	6	2	8	2	3	1	7	1	1	...	2	1	53	14	26·4	84·1
3 ,, 4	...	...	11	1	19	4	20	9	10	4	8	3	5	2	6	2	8	2	3	1	90	28	31·1	74·3
4 ,, 5	...	...	12	2	13	1	16	3	23	9	7	2	3	2	14	2	4	2	4	...	96	23	23·9	78·6
5 ,, 10	3	1	30	5	52	10	51	11	38	9	31	6	20	5	24	5	21	...	6	2	276	54	19·5	68·6
10 ,, 15	...	...	7	...	12	...	11	3	11	1	7	1	3	...	6	...	2	...	1	1	60	6	10·0	54·05
15 ,, 20	...	...	2	...	1	...	1	...	1	...	1	...	1	...	...	...	1	...	...	...	8	...	0·0	27·5
20 and upwards ...	...	...	3	...	6	...	3	...	3	...	4	1	...	...	...	...	...	...	...	...	19	1	5·2	43·1
Total	3	1	80	11	116	18	121	37	99	28	66	15	36	11	60	13	38	4	19	7	638	145	...	...
Mortality per cent	...	33·3	...	13·7	...	15·5	...	30·5	...	28·2	...	22·7	...	30·5	...	21·6	...	10·5	...	36·8	...	22·7	...	67·5

WESTERN HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage of total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	1	...	1	...	2	1	3	1	2	...	1	1	...	...	1	1	2	1	...	...	13	5	38·4	92·8
1 to 2	...	...	11	7	8	5	10	5	3	1	4	2	2	1	2	...	4	1	...	...	44	22	50·0	83·01
2 ,, 3	3	...	15	8	19	7	13	6	13	2	3	2	3	2	4	...	4	...	...	...	77	27	35·06	83·6
3 ,, 4	3	1	12	1	24	5	9	3	9	3	12	4	6	2	8	3	13	...	...	...	96	22	22·9	83·4
4 ,, 5	...	...	11	3	14	5	18	10	15	4	8	1	6	2	11	5	6	...	...	...	89	30	33·7	76·06
5 ,, 10	8	...	26	2	36	4	48	7	27	7	21	6	12	3	24	9	18	1	...	...	220	39	17·7	75·3
10 ,, 15	3	...	4	...	7	1	9	4	7	...	3	...	1	...	6	2	1	...	...	...	41	7	17·07	45·05
15 ,, 20	...	...	2	...	4	...	2	...	2	1	1	...	2	1	1	...	...	...	...	...	14	2	14·2	40·0
20 and upwards...	...	...	1	...	5	...	7	...	3	...	1	...	1	...	1	...	...	...	...	...	19	...	0·0	25·3
Total	18	1	83	21	119	28	119	36	81	18	54	16	33	11	58	20	48	3	...	...	613	154	...	...
Mortality per cent.	...	5·5	...	25·3	...	23·5	...	30·2	...	22·2	...	29·6	...	33·3	...	34·4	...	6·2	...	0·0	...	25·1	...	69·3

EASTERN HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage of total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	1	...	3	1	...	...	...	...	2	...	...	...	...	...	2	1	...	...	...	...	8	2	25·0	80·0
1 to 2	1	...	5	1	5	...	4	...	3	1	4	1	1	...	2	1	...	...	...	...	25	4	16·0	80·6
2 ,, 3	...	...	6	...	5	2	8	4	9	3	6	1	3	...	7	3	1	...	...	...	45	13	28·8	75·0
3 ,, 4	...	...	10	2	14	3	18	3	11	2	7	3	1	...	14	4	2	1	...	...	77	18	23·3	78·5
4 ,, 5	1	...	9	3	11	2	17	6	11	4	10	2	2	...	8	2	6	1	...	...	75	20	26·6	77·3
5 ,, 10	8	1	24	1	34	12	31	3	28	5	18	3	15	5	24	2	9	...	...	...	191	32	16·7	68·2
10 ,, 15	...	...	4	...	7	...	11	2	13	2	5	1	4	...	5	...	1	...	...	...	50	5	10·0	51·5
15 ,, 20	...	...	...	...	1	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...	4	...	0·0	40·0
20 and upwards .	...	...	2	...	3	...	2	...	5	...	2	...	...	...	2	...	...	...	...	...	16	...	0·0	38·09
Total ...	11	1	63	8	80	19	91	18	82	17	54	11	27	5	64	13	19	2	...	...	491	94	...	...
Mortality per cent.	...	9·09	...	12·6	...	23·7	...	19·7	...	20·7	...	20·3	...	18·5	...	20·3	...	10·5	...	0·0	...	19·1	...	67·7

SOUTH-EASTERN HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage of total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	1	...	2	1	5	2	1	1	3	2	...	...	1	1	2	...	...	...	...	...	15	7	46·6	75·0
1 to 2	1	1	5	2	10	6	4	1	4	1	2	2	3	...	3	1	1	1	...	...	33	15	45·4	82·5
2 ,, 3	1	...	9	1	6	1	13	8	8	1	6	2	5	...	3	2	...	...	...	...	51	15	29·4	70·8
3 ,, 4	1	...	14	...	13	2	13	5	8	2	12	5	4	1	8	3	3	1	1	1	77	20	25·9	86·5
4 ,, 5	2	...	11	...	19	2	14	2	8	2	7	1	11	2	10	2	2	...	...	...	84	11	13.09	80·7
5 ,, 10	3	...	20	2	33	4	47	7	28	7	19	3	12	5	17	4	2	...	...	...	191	32	16·7	75·7
10 ,, 15	1	...	3	...	8	1	7	...	6	3	5	...	5	1	4	2	2	...	...	...	41	7	17·07	61·1
15 ,, 20	...	...	3	...	1	...	1	1	1	...	2	1	...	...	...	...	...	...	...	...	8	2	25·0	38·09
20 and upwards ...	...	...	...	...	3	...	2	1	1	...	1	...	...	...	1	1	1	...	...	...	9	2	22·2	25·7
Total	10	1	77	6	98	18	102	26	67	18	54	14	41	10	48	15	11	2	1	1	509	111	...	...
Mortality ... per cent.	...	10·0	...	7·7	...	18·3	...	25·4	...	26·8	...	25·9	...	24·3	...	31·2	...	18·1	...	100·0	...	21·8	...	72·7

SOUTH-WESTERN HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage of total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	1	...	...	...	2	1	...	...	1	...	2	...	1	1	1	...	...	...	...	...	8	2	25.0	80·0
1 to 2	...	...	2	...	2	...	1	1	...	...	3	2	...	...	3	2	...	...	...	...	11	5	45·4	73·3
2 ,, 3	...	...	7	...	6	1	3	3	6	...	1	1	1	...	1	1	...	...	...	...	25	6	24·0	92·5
3 ,, 4	1	...	5	...	3	...	6	...	5	1	4	2	1	...	3	1	...	...	...	...	28	4	14·2	75·6
4 ,, 5	...	...	1	...	12	5	7	...	5	2	7	1	1	...	8	...	...	...	...	...	41	8	19·5	89·1
5 ,, 10	4	...	24	...	34	7	31	12	24	8	12	4	10	3	11	4	...	...	...	...	150	38	25·3	66·9
10 ,, 15	1	1	7	...	10	...	9	2	3	1	4	...	3	...	3	1	...	...	...	...	40	5	12·5	53·3
15 ,, 20	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	100·0	5·5
20 and upwards ...	...	...	...	...	1	...	1	...	1	...	1	...	2	...	1	...	...	...	...	...	7	...	0·0	24·1
Total	7	1	46	...	70	14	58	18	46	13	34	10	19	4	31	9	...	...	...	...	311	69	...	...
Mortality per cent.	...	14·2	...	0·0	...	20·0	...	31·03	...	28·2	...	29·4	...	21·05	...	29·03	...	0·0	...	0·0	...	22·1	...	64·6

TABLE VIA. (*continued*).—Percentage Mortality, at different ages, of cases in which Diphtheria bacilli were found, and in which Antitoxic Serum was injected. In the first line is given the day on which Antitoxic Serum was injected, reckoning this from the appearance of the initial symptoms as reported by the Ambulance Nurse.

1896.

NORTH-WESTERN HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage on total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	...	...	1	...	2	2	...	...	1	...	...	...	...	...	...	...	4	2	50·0	50·0
1 to 2	1	1	4	3	6	2	6	3	4	...	2	2	1	1	2	1	...	...	...	...	26	13	50·0	68·4
2 ,, 3	2	2	7	1	5	2	7	1	6	3	4	3	2	1	4	1	...	...	...	...	37	14	37·8	46·8
3 ,, 4	...	...	2	...	14	4	9	3	13	5	6	3	4	...	11	3	...	...	...	...	59	18	30·5	57·2
4 ,, 5	...	...	12	1	8	4	13	3	10	8	6	3	3	3	3	1	...	...	...	...	55	23	41·8	48·2
5 ,, 10	2	...	16	3	24	9	43	15	24	11	17	2	11	5	16	4	...	...	...	...	153	49	32·02	51·8
10 ,, 15	1	...	1	...	3	...	1	...	4	1	1	...	4	1	1	...	...	...	...	...	16	2	12·5	24·2
15 ,, 20	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	2	...	0·0	16·6
20 and upwards...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0	12·5
Total	6	3	42	8	62	21	80	25	63	30	38	13	26	11	37	10	...	...	...	...	354	121	...	...
Mortality per cent.	...	50·0	...	19·04	...	33·8	...	31·2	...	47·6	...	34·2	...	42·3	...	27·02	...	0·0	...	0·0	...	34·1	...	48·4

NORTH-EASTERN HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage on total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	100·0	33·3
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	...	...	3	1	33·3	50·0
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	0·0	25·0
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	3	...	...	...	5	1	20·0	62·5
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	3	1	...	...	5	3	60·0	35·7
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	2	1	50·0	28·5
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	0·0	33·3
Total	...	...	...	...	...	...	...	...	...	...	...	...	2	1	3	2	13	4	...	...	18	7	...	...
Mortality per cent.	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	..	0·0	...	50·0	...	66·6	...	30·7	...	0·0	...	38·8	...	38·2

BROOK HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage on total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	1	1	...	...	1	...	1	...	1	...	1	...	1	...	...	...	6	1	16·6	85·7
1 to 2	...	...	...	...	3	1	4	1	1	1	1	...	1	1	1	1	2	1	...	...	13	6	46·1	92·8
2 ,, 3	...	...	1	...	3	...	3	...	1	1	1	...	...	...	2	1	2	...	...	...	13	2	15.3	86·6
3 ,, 4	...	...	4	...	7	...	3	1	3	1	4	2	2	1	...	...	1	...	...	...	24	5	20·8	80·0
4 ,, 5	...	...	3	1	2	1	5	1	7	3	3	...	1	1	1	...	2	1	...	...	24	8	33·3	82·7
5 ,, 10	3	2	14	2	14	4	10	...	13	2	6	2	4	1	8	4	1	...	...	...	73	17	23·2	77·6
10 ,, 15	...	...	2	...	5	...	2	...	...	...	2	1	...	...	1	...	...	...	...	...	12	1	8·3	57·1
15 ,, 20	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0	33·3
20 and upwards...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	...	...	...	...	...	...	4	...	0·0	50·0
Total	3	2	24	3	36	7	30	3	26	8	20	5	9	4	14	6	9	2	...	...	171	40	...	...
Mortality per cent.	...	66·6	...	12·5	...	19·4	...	10·0	...	30·7	...	25·0	...	44·4	...	42·8	...	22·2	...	0·0	...	23·3	...	76·3

NORTHERN HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage on total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	1	...	0·0	100·0
3 ,, 4	26	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	26	1	3·8	78·7
4 ,, 5	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	...	0·0	60·0
5 ,, 10	97	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	97	2	2·06	75·1
10 ,, 15	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	31	...	0·0	65·9
15 ,, 20	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	0·0	50·0
20 and upwards...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0	100·0
Total	179	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	179	3	...	...
Mortality per cent.	...	1·6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·6	...	71·3

GORE FARM HOSPITAL.

Day of Injection ...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		?		Total.		Mortality per cent.	Percentage on total cases examined in which Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	0·0	80·0
4 ,, 5	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	0·0	88·8
5 ,, 10	34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	34	...	0·0	73·9
10 ,, 15	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	0·0	50·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	100·0
Total	57	...	...	...	...	...	. .	...	...	...	...	...	...	...	...	...	...	...	...	...	57	...	...	...
Mortality per cent.	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	70·3

TABLE VIIA.—Percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected. In the first line is given the day on which Antitoxic Serum was injected, reckoning this from the appearance of the initial symptoms, as reported by the Ambulance Nurse.

1895.

Day of Injection	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per cent.	Percentage on total cases examined in which no Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
FOUNTAIN HOSPITAL.																						
Under 1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	33·3
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	...	...	2	2	100·0	20·0
2 ,, 3	...	...	...	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	3	...	0·0	20·0
3 ,, 4	...	...	...	...	...	...	...	...	2	2	1	...	...	...	...	...	...	...	3	2	66·6	21·4
4 ,, 5	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	2	...	0·0	8·0
5 ,, 10	...	...	1	...	1	...	4	...	1	1	...	...	...	...	2	...	...	...	9	1	11·1	12·3
10 ,, 15	...	...	1	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	4	...	0·0	8·6
15 ,, 20	...	..	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	2	...	0·0	10·5
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	0·0	2·6
Total	...	...	2	...	4	...	5	...	8	3	2	...	3	1	3	1	...	...	27	5	...	...
Mortality per cent.	...	0·0	...	0·0	...	0·0	...	0·0	...	37·5	...	0·0	...	33·3	...	33·3	...	0·0	...	18·5	...	11·1
WESTERN HOSPITAL.																						
Under 1	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0	50·0
1 to 2	...	...	2	1	2	1	...	...	...	...	...	...	...	...	3	...	2	...	9	2	22·2	69·2
2 ,, 3	...	...	...	...	2	...	2	...	3	1	...	...	1	...	4	...	...	...	12	1	8·3	70·5
3 ,, 4	...	...	...	...	1	...	1	1	...	...	...	...	2	2	2	...	1	...	7	3	42·8	38·8
4 ,, 5	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	0·0	18·1
5 ,, 10	1	...	1	...	3	...	5	...	5	...	2	...	...	...	3	...	2	...	22	...	0·0	37·2
10 ,, 15	...	...	1	...	2	...	2	...	...	...	2	...	...	...	...	...	...	...	7	...	0·0	18·9
15 ,, 20	...	...	...	...	1	...	1	...	...	...	...	...	...	..	..	...	...	...	2	...	0·0	11·7
20 and upwards ...	...	...	...	...	3	...	3	..	3	1	1	...	...	...	...	...	...	...	10	1	10·0	16·3
Total	1	...	5	1	16	1	14	1	11	2	5	...	3	2	12	...	6	...	73	7	...	...
Mortality per cent.	...	0·0	...	20·0	...	6·2	...	7·1	...	18·1	...	0·0	...	66·6	...	0·0	...	0·0	...	9·5	...	30·8
EASTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	1	1	1	1	...	...	1	1	...	...	...	..	3	3	100·0	37·5
1 to 2	...	...	1	1	1	1	3	2	...	...	...	...	...	...	2	2	...	...	7	6	85·7	41·1
2 ,, 3	..	...	2	...	..	...	3	...	...	...	...	...	...	...	3	2	...	...	8	2	25·0	38·09
3 ,, 4	...	...	..	...	...	...	1	...	1	...	..	...	...	...	4	1	...	...	6	1	16·6	26·08
4 ,, 5	...	...	...	..	...	...	2	1	1	...	...		...		3	1	...	...	6	2	33·3	33·3
5 ,, 10	...	...	5		3	...	1	1	3	1	1	...	3	...	3	1	...	...	19	3	15·7	20·6
10 ,, 15	1	...	3	1	1	...	4	1	...	...	...	...	1	...	...	...	1	...	11	2	18·1	17·7
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	0·0	2·8
20 and upwards ...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	1	...	11	2	5	1	15	6	6	2	1	...	6	1	15	7	1	...	61	19	...	...
Mortality per cent.	...	0·0	...	18·1	...	20·0	...	40·0	...	33·3	...	0·0	..	16·6	...	46·6	...	0·0	...	31·1	...	18·9
SOUTH-EASTERN HOSPITAL.																						
Under 1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	50·0
1 to 2	1	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	4	...	0·0	57·1
2 ,, 3	...	...	1	...	...	...	2	1	...	...	...	...	1	...	...	...	...	...	4	1	25·0	44·4
3 ,, 4	...	...	...	...	1	...	...	...	2	...	3	1	1	...	...	...	4	...	11	1	9·09	45·8
4 ,, 5	1	...	2	1	1	...	...	...	...	...	2	...	...	...	1	...	...	...	7	1	14·2	41·1
5 ,, 10	1	...	5	...	3	...	7	1	2	...	...	...	1	...	1	...	5	...	25	1	4·0	40·9
10 ,, 15	...	...	9	1	5	1	1	...	...	...	1	...	...	...	1	...	...	...	17	2	11·7	41·4
15 ,, 20	...	...	3	...	...	...	1	...	1	...	1	...	1	...	...	...	1	...	8	...	0·0	36·3
20 and upwards ...	...	...	3	...	2	...	3	...	1	...	1	...	...	...	2	...	...	...	12	...	0·0	32·4
Total	3	...	24	2	13	1	15	2	6	...	8	1	4	...	5	...	11	...	89	6	...	...
Mortality per cent.	...	0·0	...	8·3	...	7·6	...	13·3	...	0·0	...	12·5	...	0·0	...	0·0	...	0·0	...	6·7	...	40·4
SOUTH-WESTERN HOSPITAL.																						
Under 1	...	...	1	1	...	...	...	...	1	...	...	...	...	...	2	2	...	...	4	3	75·0	80·0
1 to 2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	50·0
2 ,, 3	...	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	3	...	0·0	100·0
3 ,, 4	...	...	1	1	1	...	2	...	1	1	...	...	1	1	3	1	...	...	9	4	44·4	60·0
4 ,, 5	...	...	1	...	...	...	2	...	1	1	...	...	...	...	...	...	...	...	4	1	25·0	66·6
5 ,, 10	...	...	2	1	1	...	2	...	2	1	5	1	1	...	...	...	...	...	13	3	23·07	38·2
10 ,, 15	...	...	1	...	2	...	1	..	...	...	1	...	...	...	...	...	...	...	5	...	0·0	27·7
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	...	...	8	3	5	...	7	...	6	3	6	1	2	1	5	3	...	...	39	11	...	...
Mortality per cent.	...	0·0	...	37·5	...	0·0	...	0·0	...	50·0	...	16·6	...	50·0	...	60·0	...	0·0	...	28·2	...	33·9

Table VIIa. (*continued*).—Percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected. In the top line is given the day on which Antitoxic Serum was injected, reckoning this from the appearance of the initial symptoms, as reported by the Ambulance Nurse.

1895.

NORTH-WESTERN HOSPITAL.

Day of Injection...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per cent.	Percentage of these cases on total cases examined in which no Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	100·0	20·0
1 to 2	...	...	1	...	1	1	1	1	...	...	2	1	1	1	...	...	1	1	7	5	71·4	53·8
2 ,, 3	...	...	1	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	3	1	33·3	21·4
3 ,, 4	...	...	1	...	...	...	2	1	2	1	1	...	2	1	...	...	...	...	8	3	37·5	40·0
4 ,, 5	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...	...	...	...	2	1	50·0	16·6
5 ,, 10	...	...	2	...	...	...	...	...	...	...	1	...	...	...	3	1	...	...	6	1	16·6	15·3
10 ,, 15	1	...	...	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	4	...	0·0	16·6
15 ,, 20	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	8·3
20 and upwards ...	...	...	2	...	5	1	1	...	1	...	...	...	...	...	1	...	...	...	10	1	10·0	29·4
Total	1	...	7	1	10	3	6	3	4	1	4	1	4	2	5	1	1	1	42	13	...	...
Mortality per cent.	...	0·0	...	14·2	...	30·0	...	50·0	...	25·0	...	25·0	...	50·0	...	20·0	...	100·0	...	30·9	...	24·2

NORTHERN HOSPITAL.

Ages.	1 Cases.	1 Deaths.	2 Cases.	2 Deaths.	3 Cases.	3 Deaths.	4 Cases.	4 Deaths.	5 Cases.	5 Deaths.	6 Cases.	6 Deaths.	7 Cases.	7 Deaths.	8 and upwards Cases.	8 and upwards Deaths.	Onset in Hospital Cases.	Onset in Hospital Deaths.	Total Cases.	Total Deaths.	Mortality per cent.	Percentage
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	0·0	8·5
10 ,, 15	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	12·5
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...
Mortality per cent.	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	6·4

TABLE VIIA. (*continued*).—Percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected. In the top line is given the day on which Antitoxic Serum was injected, reckoning this from the appearance of the initial symptoms, as reported by the Ambulance Nurse.

1896.

FOUNTAIN HOSPITAL.

Day of Injection...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per cent.	Percentage of these cases on total cases examined in which no Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	0·0	20·0
1 to 2...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	2	2	2	1	7	3	42·8	50·0
2 „ 3...	...	...	...	...	...	...	2	1	4	...	1	1	1	...	1	...	1	...	10	2	20·0	41·6
3 „ 4...	...	...	...	...	1	1	2	1	1	1	2	1	3	2	1	1	1	...	11	7	63·6	39·2
4 „ 5...	...	...	...	...	1	...	6	2	2	1	1	...	...	...	2	2	...	...	12	5	41·6	37·5
5 „ 10...	...	...	2	...	4	2	5	...	4	1	3	1	2	...	9	2	2	...	31	6	19·3	26·9
10 „ 15...	...	...	...	...	1	...	2	...	1	1	...	...	...	...	...	...	1	...	5	1	20·0	8·3
15 „ 20...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	...	...	...	3	...	0·0	8·5
20 and upwards ...	...	...	2	...	...	...	2	...	2	...	...	...	1	...	...	...	...	...	7	...	0·0	15·9
Total	...	...	4	...	8	3	20	4	15	4	8	3	7	2	18	7	7	1	87	24	...	...
Mortality per cent.	...	0·0	...	0·0	...	37·5	...	20·0	...	26·6	...	37·5	...	28·5	...	38·8	...	14·4	...	27·5	...	24·3

WESTERN HOSPITAL.

Day of Injection...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per cent.	Percentage of these cases on total cases examined in which no Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	1	...	...	2	1	50·0	40·0
1 to 2...	...	...	1	...	1	1	1	...	...	...	...	...	...	...	2	1	...	...	5	2	40·0	50·0
2 „ 3...	...	...	...	...	1	...	4	2	1	...	1	1	...	...	4	...	...	...	11	3	27·2	50·0
3 „ 4...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	3	1	...	...	6	1	16·6	30·0
4 „ 5...	...	...	1	...	1	...	1	...	1	1	2	1	...	...	2	...	...	...	8	2	25·0	30·7
5 „ 10...	...	...	3	...	4	...	3	1	2	1	1	...	2	...	8	2	...	...	23	4	17·3	30·6
10 „ 15...	...	...	1	...	1	...	1	...	3	...	...	...	1	...	1	...	...	...	8	...	0·0	17·7
15 „ 20...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	3·8
20 and upwards ...	...	...	...	...	...	...	1	...	1	...	1	...	1	...	1	1	...	...	5	1	20·0	8·6
Total	...	...	6	...	9	1	13	3	10	2	5	2	4	...	22	6	...	...	69	14	...	...
Mortality per cent.	...	0·0	...	0·0	...	11·1	...	23·07	...	20·0	...	40·0	...	0·0	...	27·2	...	0·0	...	20·2	...	24·04

EASTERN HOSPITAL.

Day of Injection...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per cent.	Percentage of these cases on total cases examined in which no Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	0·0	66·6
1 to 2...	...	...	...	...	3	1	...	...	1	...	...	...	...	...	2	1	...	...	6	2	33·3	42·8
2 „ 3...	...	...	...	...	...	...	3	...	2	1	3	1	1	...	...	...	...	...	9	2	22·2	39·1
3 „ 4...	...	...	2	...	1	...	...	...	2	1	1	...	...	...	2	1	...	...	8	2	25·0	21·05
4 „ 5...	...	...	...	...	...	...	...	...	1	1	1	1	1	...	2	...	...	...	5	2	40·0	15·6
5 „ 10...	...	...	...	...	2	...	1	...	2	...	1	1	3	...	6	1	...	...	15	2	13·3	17·04
10 „ 15...	...	...	...	...	...	..	3	...	...	...	1	...	1	...	1	...	...	...	6	...	0·0	10·9
15 „ 20...	...	...	...	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	3	...	0·0	10·3
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	0·0	2·3
Total	...	...	3	...	7	1	8	...	8	3	8	3	7	...	14	3	...	...	55	10	...	...
Mortality per cent.	...	0·0	...	0·0	...	14·2	...	0·0	...	37·5	...	37·5	...	0·0	...	21·4	...	0·0	...	18·1	...	16·9

SOUTH-EASTERN HOSPITAL.

Day of Injection...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per cent.	Percentage of these cases on total cases examined in which no Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	1	...	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	3	2	66·6	50·0
1 to 2...	...	...	1	...	...	...	1	...	2	1	1	1	1	...	3	...	...	...	9	2	22·2	47·3
2 „ 3...	1	...	2	1	1	1	1	...	2	1	...	...	...	...	2	...	...	...	9	3	33·3	50·0
3 „ 4...	...	...	...	...	2	1	1	1	3	...	1	1	...	...	2	2	1	...	10	5	50·0	47·6
4 „ 5...	4	...	2	...	1	1	...	...	2	...	1	...	1	...	3	1	...	...	14	2	14·2	48·2
5 „ 10...	...	...	3	...	7	1	4	1	2	...	...	...	1	...	...	...	2	...	19	2	10·5	27·1
10 „ 15...	1	...	...	...	3	...	1	...	3	1	...	...	1	...	3	1	...	...	12	2	16·6	29·2
15 „ 20...	...	...	1	...	...	...	...	...	1	...	2	2	...	...	...	...	...	...	4	2	50·0	12·9
20 and upwards ...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...	...	...	4	...	0·0	10·2
Total	8	...	10	2	15	5	8	2	16	3	5	4	5	...	14	4	3	...	84	20	...	...
Mortality per cent.	...	0·0	...	20·0	...	33·3	...	25·0	...	18·7	...	80·0	...	0·0	...	28·5	...	0·0	...	23·8	...	30·6

SOUTH-WESTERN HOSPITAL.

Day of Injection...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per cent.	Percentage of these cases on total cases examined in which no Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0	50·0
2 „ 3	...	...	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	3	...	0·0	30·0
3 „ 4	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...	...	2	1	50·0	25·0
4 „ 5	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	25·0
5 „ 10	...	...	...	...	1	1	1	...	...	...	...	...	1	...	...	...	...	...	3	1	33·3	12·5
10 „ 15	...	...	1	...	1	1	2	...	...	...	1	...	...	...	...	...	...	...	5	1	20·0	16·6
15 „ 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	1	...	...	...	3	1	33·3	9·09
Total	1	...	3	...	2	2	4	...	3	1	4	1	1	...	1	...	...	...	19	4	...	...
Mortality per cent.	...	0·0	...	0·0	...	100·0	...	0·0	...	33·3	...	25·0	...	0·0	...	0·0	...	0·0	...	21·05	...	14·1

TABLE VIIA. (*continued*).—Percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected. In the top line is given the day on which Antitoxic Serum was injected, reckoning this from the appearance of the initial symptoms, as reported by the Ambulance Nurse.

1896.

Day of Injection...	1		2		3		4		5		6		7		8 and upwards.		Onset in Hospital.		Total.		Mortality per cent.	Percentage of these cases on total cases examined in which no Diphtheria bacilli were found.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
NORTH-WESTERN HOSPITAL.																						
Under 1	...	...	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	3	1	33·3	50·0
1 to 2	...	...	1	1	...	...	...	...	...	...	1	1	...	...	2	2	...	...	4	4	100·0	40·0
2 „ 3	...	...	...	...	...	...	1	...	...	...	...	...	2	2	2	2	...	...	5	4	80·0	38·4
3 „ 4	...	...	...	...	1	...	...	...	...	...	1	...	...	...	2	...	...	...	4	...	0·0	22·2
4 „ 5	...	...	...	...	2	...	...	...	2	...	1	...	...	...	1	...	...	...	6	...	0·0	22·2
5 „ 10	1	...	...	...	1	1	5	1	1	...	1	...	...	...	2	...	...	...	11	2	18·1	22·9
10 „ 15	...	...	...	...	2	...	1	...	1	...	1	...	...	...	2	1	...	...	7	1	14·2	30·4
15 „ 20	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	10·0
20 and upwards	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	0·0	3·3
Total	1	...	2	2	8	1	8	1	5	...	5	1	2	2	11	5	...	...	42	12	...	...
Mortality per cent.	...	0·0	...	100·0	...	12·5	...	12·5	...	0·0	...	20·0	...	100·0	...	45·4	...	0·0	...	28·5	...	22·7
NORTH-EASTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	0·0	100·0
1 to 2	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	100·0	33·3
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 „ 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0,0	0·0
4 „ 5	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	2	1	4	1	25·0	30·7
5 „ 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
10 „ 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
15 „ 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	...	...	1	...	...	...	1	1	1	...	...	...	...	...	...	...	3	1	6	2	...	...
Mortality per cent.	...	0·0	...	0·0	...	0·0	...	100·0	...	0·0	...	0·0	...	0·0	...	0·0	...	33·3	...	33·3	...	9·8
BROOK HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	0·0	100·0
2 „ 3	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	33·3
3 „ 4	...	...	...	...	1	...	...	...	...	...	...	...	1	1	...	...	1	...	3	1	33·3	60·0
4 „ 5	...	...	...	...	...	...	2	1	1	...	...	...	...	...	...	...	...	...	3	1	33·3	60·0
5 „ 10	...	...	1	...	1	...	1	...	...	...	1	...	...	...	1	...	...	...	5	...	0·0	31·2
10 „ 15	...	...	...	...	...	...	1	...	1	...	...	...	1	1	...	...	...	...	3	1	33·3	37·5
15 „ 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	0·0	11·1
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	...	...	2	...	2	...	4	1	3	...	1	...	2	2	2	...	1	...	17	3	...	...
Mortality per cent.	...	0·0	...	0·0	...	0·0	...	25·0	...	0·0	...	0·0	...	100·0	...	0·0	...	0·0	...	17·6	...	31·4
NORTHERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 „ 4	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	0·0	50·0
4 „ 5	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	0·0	37·5
5 „ 10	11	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	1	9·09	40·7
10 „ 15	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	0·0	38·4
15 „ 20	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0	25·0
20 and upwards	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	0·0	50·0
Total	27	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	27	1	...	...
Mortality per cent.	...	3·7	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	3·7	...	39·7
GORE FARM HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 „ 4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	100·0
4 „ 5	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	50·0
5 „ 10	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	0·0	38·4
10 „ 15	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	100·0
15 „ 20	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0	100·0
20 and upwards	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	0·0	100·0
Total	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	..	...	...
Mortality per cent.	...	0·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	55·0

TABLE VIIIA.—Percentage Mortality, at different ages, of cases in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected.

1895.

Ages.	FOUNTAIN.			WESTERN.			EASTERN.			SOUTH-EASTERN.			SOUTH-WESTERN.			NORTH-WESTERN.			NORTH-EASTERN.			BROOK.*			NORTHERN.			GORE FARM.*		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	6	2	33·3	3	0	0·0	3	2	66·0	1	0	0·0	2	0	0·0	4	0	0·0	...	...	0·0	...	...	...	...	...	0·0	...	...	...
1 to 2	20	6	30·0	5	3	60·0	10	8	80·0	4	1	25·0	1	0	0·0	18	9	50·0	3	1	33·0	...	...	...	...	...	0·0	...	...	...
2 ,, 3	31	10	32·2	13	1	7·6	35	15	42·8	6	3	50·0	7	1	14.2	35	11	31·4	13	7	53·8	...	...	...	2	0	0·0	...	...	...
3 ,, 4	34	12	35·2	22	5	22·7	35	12	34·2	8	1	12·5	10	2	20·0	49	14	28·5	10	2	20·0	...	...	...	11	0	0·0	...	...	...
4 ,, 5	39	3	7·6	19	2	10·5	49	13	26·5	9	0	0·0	10	1	10·0	37	10	27·02	6	1	16·6	...	...	...	19	0	0·0	...	...	...
5 ,, 10	152	11	7·2	51	4	7·8	140	28	20·0	34	5	14·7	57	2	3·5	138	22	15·9	18	2	11·1	...	...	...	63	1	1·5	...	...	...
10 ,, 15	63	2	3·1	27	1	3·7	76	4	5·2	14	0	0·0	28	1	3·5	35	3	8·5	6	0	0·0	...	...	...	19	0	0·0	...	...	..
15 ,, 20	29	2	6·8	11	1	9·9	27	1	3·7	5	0	0·0	12	0	0·0	10	0	0·0	...	...	0·0	...	...	...	7	0	0·0	...	...	...
20 and upwards...	26	2	7·6	38	1	2·6	31	0	0·0	13	0	0·0	14	0	0·0	20	0	0·0	2	0	0·0	...	...	...	1	0	0·0	...	...	...
Total	400	50	...	189	18	...	406	83	...	94	10	...	141	7	...	346	69	...	58	13	...	...	...	...	122	1	...	...	...	...
Mortality per cent.	...	...	12·5	...	...	9·5	...	...	20·4	...	...	10·6	...	...	4·9	...	...	19·9	...	...	22·4	...	...	...	...	...	0·8	...	...	...

* Not opened until 1896.

1896.

Under 1	4	3	75·0	1	1	100·0	2	1	50·0	5	2	40·0	2	1	50·0	4	1	25·0	...	...	0·0	1	0	0·0	...	...	0·0	...	...	0·0
1 to 2	12	7	58·3	9	1	11·1	6	2	33·3	7	4	57·1	4	2	50·0	12	10	83·3	2	0	0·0	1	0	0·0	...	...	0·0	...	...	0·0
2 ,, 3	10	2	20·0	15	5	33·3	15	3	20·0	21	6	28·5	2	2	100 0	42	16	38·09	3	0	0·0	2	0	0·0	...	...	0·0	...	...	0·0
3 ,, 4	31	5	16·1	19	2	10·5	21	2	9·5	12	3	25·0	9	2	22·2	44	16	36·3	3	0	0·0	6	0	0·0	7	0	0·0	1	0	0·0
4 ,, 5	26	2	7·6	28	3	10·7	22	1	4·5	20	4	20·0	5	1	20·0	59	17	28·8	3	0	0·0	5	1	20·0	10	0	0·0	1	0	0·0
5 ,, 10	126	7	5·5	72	1	1·3	89	5	5·6	61	5	8·1	74	2	2·7	142	26	18·3	9	2	22·2	21	0	0·0	32	1	3·1	12	0	0·0
10 ,, 15	51	0	0·0	50	3	6·0	47	1	2·1	26	0	0·0	35	0	0·0	50	2	4·0	5	0	0·0	9	0	0·0	16	0	0·0	10	0	0·0
15 ,, 20	21	0	0·0	21	1	4·7	6	0	0·0	13	0	0·0	17	0	0·0	10	0	0·0	2	0	0·0	4	0	0·0	7	0	0·0	...	...	0·0
20 and upwards...	25	0	0·0	56	0	0·0	26	0	0·0	26	0	0·0	22	0	0·0	14	0	0·0	2	0	0·0	4	0	0·0	...	0	0·0	...	...	0·0
Total	306	26	...	271	17	...	234	15	...	191	24	...	170	10	...	377	88	...	29	2	...	53	1	...	72	1	...	24	0	...
Mortality per cent.	...	...	8·4	...	...	6·2	...	...	6·4	...	...	12·5	...	...	5·8	...	...	23·3	...	...	6·8	...	...	1·8	...	...	1·3	...	...	0·0

TABLE IXA.—Percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found, and in which no Antitoxic Serum was injected.

1895.

Ages.	FOUNTAIN.			WESTERN.			EASTERN.			SOUTH-EASTERN.			SOUTH-WESTERN.			NORTH-WESTERN.			NORTH-EASTERN.			BROOK.*			NORTHERN.			GORE FARM.*		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	2	1	50.0	2	0	0·0	5	4	80·0	1	1	0·0	1	0	0·0	4	3	75·0	2	0	0·0	...	...	...	...	...	0·0	...	...	...
1 to 2	8	2	25·0	4	1	25·0	10	4	40·0	3	0	0·0	1	0	0·0	6	2	33·3	6	0	0·0	...	...	...	...	...	0·0	...	...	...
2 ,, 3	12	3	25·0	5	1	20·0	13	3	23 07	5	2	40·0	...	...	0·0	11	5	45·4	7	1	14·2	...	...	...	...	...	0·0	...	...	...
3 ,, 4	11	2	18·1	11	3	27·2	17	3	17·6	13	5	38·4	6	0	0·0	12	2	16·6	11	0	0·0	...	...	...	7	0	0·0	...	...	...
4 ,, 5	23	2	8·6	9	2	22·2	12	2	16·6	10	2	20·0	2	0	0·0	10	3	30·0	15	4	26·6	...	...	...	6	0	0·0	...	...	...
5 ,, 10	64	5	7·8	37	3	8·1	73	4	5·4	36	3	8·3	21	1	4·7	33	5	15·1	32	4	12·5	...	...	...	32	0	0·0	...	...	...
10 ,, 15	42	0	0·0	30	0	0·0	51	0	0·0	24	2	8·3	13	0	0·C	20	2	10·0	16	0	0·0	...	...	...	7	0	0·0	...	...	...
15 ,, 20	17	0	0·0	15	0	0·0	34	2	5·8	14	0	0·0	11	1	9·09	11	1	9·09	6	0	0·0	...	...	...	1	0	0·0	...	...	...
20 and upwards...	37	1	2·7	51	2	3·9	46	0	0·0	25	0	0·0	21	0	0·0	24	1	4·1	4	0	0·0	...	...	...	5	0	0·0	...	...	...
Total	216	16	...	164	12	...	261	22	...	131	15	...	76	2	...	131	24	...	99	9	...	...	...	...	58	0	0·0	...	...	...
Mortality per cent.	...	...	7·4	...	...	7·3	...	...	8·4	...	...	11·4	...	...	2·6	...	...	18·3	...	...	9·09	...	...	...	...	...	0·0	...	...	...

* Not opened until 1896.

1896.

Ages.	FOUNTAIN.			WESTERN.			EASTERN.			SOUTH-EASTERN.			SOUTH-WESTERN.			NORTH-WESTERN.			NORTH-EASTERN.			BROOK.*			NORTHERN.			GORE FARM.*		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	4	3	75·0	3	2	66·6	1	1	100·0	3	0	0·0	...	...	0·0	3	2	66·6	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2	7	1	14·2	5	1	20·0	8	2	25·0	10	3	30·0	2	0	0·0	6	4	66·6	2	1	50·0	...	...	0·0	...	...	0·0	...	...	0·0
2 ,, 3	14	3	21·4	11	4	36·3	14	4	28·5	9	0	0·0	7	4	57·1	8	3	37·5	2	0	0·0	2	1	50·0	...	...	0·0	...	...	0·0
3 ,, 4	17	2	11·7	14	1	7·1	30	5	16·6	11	2	18·1	6	0	0·0	14	0	0·0	7	0	0·0	2	0	0·0	3	0	0·0	...	...	0·0
4 ,, 5	20	2	10·0	18	1	5·5	27	5	18·5	15	3	20·0	3	0	0·0	21	5	23·8	9	1	11·1	2	0	0·0	5	0	0·0	1	0	0·0
5 ,, 10	84	2	2·3	52	5	9·6	73	5	6·8	51	2	3·9	21	0	0·0	37	4	10·8	16	0	0·0	11	1	9·09	16	0	0·0	8	0	0·0
10 ,, 15	55	1	1·8	37	0	0·0	49	2	4·08	29	2	6·8	25	1	4·0	16	1	6·2	14	0	0·0	5	0	0·0	8	0	0·0	...	...	0·0
15 ,, 20	32	0	0·0	25	0	6.0	28	0	0·0	27	1	3·7	21	0	0·0	9	0	0·0	3	0	0·0	8	0	0·0	6	0	0·0	...	...	0·0
20 and upwards...	37	0	0·0	53	2	3·7	41	1	2·4	35	1	2·8	30	0	0·0	29	0	0·0	2	0	0·0	7	0	0·0	3	0	0·0	...	...	0·0
Total	270	14	...	218	16	...	269	25	...	190	14	...	115	5	...	143	19	...	55	2	...	37	2	...	41	0	...	9	0	...
Mortality per cent.	...	...	5·1	...	...	7·3	...	...	9·2	...	...	7·3	...	...	4·3	...	...	13·2	...	...	3·6	...	...	5·4	...	...	0·0	...	...	0·0

Table Xa. —Showing cases, at different ages, in which Diphtheria bacilli were found, and which were re-injected with Antitoxic Serum after a lapse of a period of at least 14 days. These cases may, therefore, be looked upon as having undergone a "Relapse."

1895.

Ages.	Fountain. Cases.	Fountain. Deaths.	Fountain. Mortality per cent.	Western. Cases.	Western. Deaths.	Western. Mortality per cent.	Eastern. Cases.	Eastern. Deaths.	Eastern. Mortality per cent.	*South-Eastern. Cases.	*South-Eastern. Deaths.	*South-Eastern. Mortality per cent.	South-Western. Cases.	South-Western. Deaths.	South-Western. Mortality per cent.	North-Western. Cases.	North-Western. Deaths.	North-Western. Mortality per cent.	Brook. Cases.	Brook. Deaths.	Brook. Mortality per cent.
Under 1 ...	...	...	0·0	...	...	0·0	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...
1 to 2 ...	3	1	33·3	1	1	100·0	...	...	...	2	...	0·0	...	...	...	...	...	...	...	...	...
2 ,, 3 ...	...	...	0·0	...	...	0·0	...	...	...	1	1	100·0	...	...	...	...	...	...	...	...	...
3 ,, 4 ...	1	...	0·0	...	...	0·0	...	...	...	2	...	0·0	...	...	...	...	...	...	...	...	...
4 ,, 5 ...	...	...	0·0	...	...	0·0	...	...	...	2	...	0·0	...	...	...	...	...	...	...	...	...
5 ,, 10 ...	1	...	0·0	...	...	0·0	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...
10 ,, 15 ...	...	...	0·0	...	...	0·0	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...
15 ,, 20 ...	...	...	0·0	...	...	0·0	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	0·0	...	...	0·0	...	...	...	...	...	0·0	...	...	...	...	...	...	...	...	...
Total ...	5	1	20·0	1	1	100·0	...	...	...	7	1	14·2	...	...	...	...	...	..	...	...	...

* At the South-Eastern Hospital there was one "Relapse" amongst the cases of Diphtheria in which no Diphtheria bacilli were found—patient, between 5 and 10 years of age, recovered.

1896.

Ages.	Fountain. Cases.	Fountain. Deaths.	Fountain. Mortality per cent.	Western. Cases.	Western. Deaths.	Western. Mortality per cent.	Eastern. Cases.	Eastern. Deaths.	Eastern. Mortality per cent.	*South-Eastern. Cases.	*South-Eastern. Deaths.	*South-Eastern. Mortality per cent.	South-Western. Cases.	South-Western. Deaths.	South-Western. Mortality per cent.	North-Western. Cases.	North-Western. Deaths.	North-Western. Mortality per cent.	Brook. Cases.	Brook. Deaths.	Brook. Mortality per cent.
Under 1 ...	...	...	0·0	...	...	0·0	1	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2 ...	1	1	100·0	1	1	100·0	...	...	0·0	1	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
2 ,, 3 ...	...	...	0·0	3	1	33·3	1	1	100·0	2	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0
3 ,, 4 ...	1	...	0·0	1	...	0·0	...	...	0·0	2	...	0·0	...	...	0·0	1	...	0·0	1	...	0·0
4 ,, 5 ...	1	...	0·0	2	...	0·0	1	...	0·0	4	...	0·0	...	...	0·0	...	...	0·0	1	...	0·0
5 ,, 10 ...	3	...	0·0	3	...	0·0	1	...	0·0	6	1	16·6	...	...	0·0	...	...	0·0	2	...	0·0
10 ,, 15 ...	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
15 ,, 20 ...	...	...	0·0	1	...	0·0	...	...	0·0	...	...	0·0	1	...	0·0	...	...	0·0	...	...	0·0
20 and upwards...	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	..	...	0·0	...	...	0·0	...	...	0·0
Total ...	6	1	16·6	11	2	18·1	4	1	25·0	15	1	6·6	1	...	0·0	1	...	0·0	5	1	20·0

* At the South-Eastern Hospital there was one "Relapse" amongst the cases of Diphtheria in which no Diphtheria bacilli were found—patient, between 2 and 3 years of age, recovered.

TABLE XIA.—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The figures in the broader column refer to the lowest and highest number of days on which the rash appeared after the injection of Antitoxic Serum, not counting the day of injection.

1895.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxin Rash.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.	
FOUNTAIN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	1	4	1	13	...	...	1	2	...	...	...	...	3	
1 to 2	9	9 to 15	1	O.A.	...	...	...	...	...	...	...	...	2	18 and 19	...	...	...	...	...	...	12	
2 ,, 3	13	2 ,, 25	2	10 and 25	...	...	...	...	...	...	1	16	2	7 ,, 17	...	...	1	13	...	...	19	
3 ,, 4	7	3 ,, 10	4	3 to 18	3	3 to 10	2	O.I.H & 28	2	5 and 12	...	...	2	4 ,, 8	2	25 and 49	...	...	...	...	22	
4 ,, 5	12	3 ,, 17	3	3 ,, 10	3	14 ,, 52	1	3	3	3 to 20	1	9	2	10 ,, 12	3	4 to 15	...	...	...	...	28	
5 ,, 10	23	2 ,, 18	6	1 ,, 25	2	16 and 32	...	...	9	4 ,, 35	3	6 to 14	2	8 ,, 20	8	3 ,, 12	...	...	1	5	54	
10 ,, 15	8	5 ,, 11	3	10 ,, 32	...	...	...	...	2	21 and 26	2	7 and 10	2	12 ,, 13	3	13 ,, 38	...	...	...	...	20	
15 ,, 20	3	7 ,, 12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	...	...	1	
Total	75	...	19	...	8	...	3	...	17	...	8	...	14	...	17	...	1	...	1	...	162	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						56·4
WESTERN HOSPITAL.																						
Under 1	2	12 and 14	...	...	...	...	...	...	2	8 and 13	...	...	...	...	...	...	...	...	...	...	4	
1 to 2	16	1 to 28	6	9 to 30	1	9	1	8	...	...	...	...	...	...	4	8 to 22	...	...	...	...	28	
2 ,, 3	11	8 ,, 28	8	7 ,, 10	...	...	3	8 to 14	3	4 to 9	...	...	...	...	...	...	...	...	...	...	25	
3 ,, 4	18	4 ,, 14	11	5 ,, 20	4	17 to 24	4	4 ,, 22	2	4 and 5	...	...	...	...	3	15 to 17	...	...	...	...	42	
4 ,, 5	6	6 ,, 20	14	2 ,, 13	1	18	1	5	1	6	...	...	...	...	3	4 ,, 14	...	...	...	...	26	
5 ,, 10	31	2 ,, 22	39	3 ,, 36	4	10 to 15	7	8 to 19	4	2 to 21	...	...	...	...	2	9 and 18	...	...	...	...	87	
10 ,, 15	11	7 ,, 15	7	7 ,, 22	2	6 and 26	...	...	...	...	...	...	...	...	1	9	...	...	...	...	21	
15 ,, 20	2	8 and 9	1	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
20 and upwards...	1	9	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	
Total	98	...	87	...	12	...	16	...	12	...	...	...	...	...	13	...	...	...	...	...	238	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						57·7
EASTERN HOSPITAL.																						
Under 1	...	...	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
1 to 2	2	2 and 8	8	2 to 15	4	5 to 15	1	1	...	...	...	...	2	7 and 9	1	11	...	...	...	...	18	
2 ,, 3	6	6 to 12	10	4 ,, 13	...	...	...	...	...	...	...	...	1	10	1	9	...	...	...	...	18	
3 ,, 4	7	7 ,, 14	10	3 ,, 18	...	...	1	9	2	10 and 11	...	...	1	9	5	7 to 17	1	11	...	...	27	
4 ,, 5	4	7 ,, 20	10	9 ,, 23	1	3	1	7	2	4 ,, 30	...	...	2	9 and 13	3	5 ,, 7	1	17	...	...	24	
5 ,, 10	18	6 ,, 17	11	3 ,, 24	...	...	1	7	2	4 ,, 5	3	4 to 9	9	3 to 16	10	5 ,, 12	1	4	...	...	55	
10 ,, 15	5	7 ,, 15	6	7 ,, 10	...	...	...	...	...	...	...	...	2	7 and 9	3	8 ,, 9	...	...	...	...	16	
15 ,, 20	1	9	2	11 and 14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
20 and upwards...	1	10	...	...	...	...	...	...	...	...	...	...	...	...	1	9	...	...	...	...	2	
Total	44	...	58	...	5	...	4	...	6	...	3	...	17	...	24	...	3	...	...	...	164	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						54·3
SOUTH-EASTERN HOSPITAL.																						
Under 1	...	...	1	20	...	...	1	10	...	...	...	...	...	...	...	...	...	...	...	...	2	
1 to 2	4	6 to 8	6	8 to 23	...	...	...	...	1	9	...	...	...	...	1	8	1	2	...	...	13	
2 ,, 3	10	2 ,, 11	3	2 ,, 13	...	...	...	...	...	...	...	...	1	8	2	18 and 20	1	2	...	...	17	
3 ,, 4	8	7 ,, 9	6	6 ,, 52	...	...	...	...	...	...	...	...	...	...	1	2	...	...	...	...	15	
4 ,, 5	9	5 ,, 10	12	3 ,, 12	...	...	1	11	...	...	...	...	...	...	2	6 and 56	...	...	...	...	24	
5 ,, 10	34	1 ,, 14	26	1 ,, 20	...	...	2	5 and 15	...	...	1	71	...	...	4	5 to 30	...	...	...	...	67	
10 ,, 15	11	7 ,, 22	15	3 ,, 21	1	10	...	...	1	80	...	...	...	...	1	8	...	...	...	...	29	
15 ,, 20	5	8 ,, 17	3	3 ,, 12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	
20 and upwards ...	4	7 ,, 15	1	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	
Total	85	...	73	...	1	...	4	...	2	...	1	...	1	...	11	...	2	...	...	...	180	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						42·8

NOTE.—O.A. = On admission to Hospital. O.I.H. = Onset in Hospital.

TABLE XIA. (*continued*).—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The figures in the broader column refer to the lowest and highest number of days on which the rash appeared after the injection of Antitoxic Serum, not counting the day of injection.

1895.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxin Rash.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.	
SOUTH-WESTERN HOSPITAL.																						
Under 1	2	8 and 10	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
1 to 2	9	9 to 35	2	6 and 11	...	...	...	...	...	...	...	...	...	...	...	...	1	14	...	...	12	
2 ,, 3	13	8 ,, 18	1	13	...	...	...	...	...	...	1	10	...	...	...	...	...	...	...	...	15	
3 ,, 4	25	6 ,, 19	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	26	
4 ,, 5	23	8 ,, 18	2	2 and 12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	25	
5 ,, 10	79	4 ,, 39	1	34	...	...	...	...	1	23	...	...	...	...	2	17 and 20	1	6	...	...	84	
10 ,, 15	18	10 ,, 17	1	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19	
15 ,, 20	5	9 ,, 17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	
20 and upwards...	3	12 ,, 16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
Total	177	...	9	...	...	...	...	...	1	...	1	...	...	...	2	...	2	...	...	...	192	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						63·3
NORTH-WESTERN HOSPITAL.																						
Under 1	1	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	5	...	...	2	
1 to 2	3	8 to 10	1	3	...	...	...	...	...	...	...	...	...	...	2	4 and 43	1	10	...	...	7	
2 ,, 3	4	7 ,, 15	1	14	...	...	...	...	...	...	...	...	...	...	...	...	1	5	...	...	6	
3 ,, 4	3	7 ,, 14	2	8 and 9	1	10	...	...	...	...	...	...	1	11	...	...	...	...	...	...	7	
4 ,, 5	1	9	...	...	...	...	...	...	...	...	...	...	...	...	1	34	...	...	...	...	2	
5 ,, 10	14	6 to 13	7	8 to 20	...	...	...	...	1	4	...	...	...	...	2	5 and 24	1	8	1	2	26	
10 ,, 15	2	7 and 9	...	...	1	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
15 ,, 20	1	3	...	...	...	...	...	...	...	...	...	...	...	...	1	6	...	...	...	...	2	
20 and upwards...	2	9 and 10	1	9	...	...	...	...	...	...	...	...	...	...	1	9	...	...	...	...	4	
Total	31	...	12	...	2	...	...	...	1	...	...	...	1	...	7	...	4	...	1	...	59	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						21 4
NORTHERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
3 ,, 4	2	9 and 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	
4 ,, 5	1	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
5 ,, 10	8	7 to 16	1	12	...	...	...	...	...	...	...	...	...	...	3	8 to 10	...	...	...	...	12	
10 ,, 15	4	8 ,, 16	1	5	1	10	...	...	...	...	...	...	...	...	1	10	...	...	...	...	7	
15 ,, 20	2	10 and 13	...	...	...	...	...	...	...	...	...	...	...	...	1	9	...	...	...	...	3	
20 and upwards...	1	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
Total	18	...	2	...	1	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	26	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						37·6

NOTE.—O.A. = On admission to Hospital.

TABLE XIA (*continued*).—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The figures in the broader column refer to the lowest and highest number of days on which the rash appeared, not counting the day of injection.

1896.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxin Rash.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.	
FOUNTAIN HOSPITAL.																						
Under 1	...	...	1	19	...	...	...	...	1	11	...	...	...	...	...	...	...	...	...	...	2	
1 to 2	1	15	1	12	...	...	...	...	...	...	1	10	2	11 and 12	2	6 and 15	2	8 and 39	...	...	9	
2 ,, 3	6	7 to 29	7	3 to 16	1	16	...	...	5	5 to 34	2	5 and 29	6	5 to 29	4	4 to 35	1	5	...	...	32	
3 ,, 4	5	10 ,, 16	9	8 ,, 23	3	12 to 25	...	...	3	3 ,, 38	4	3 to 14	8	6 ,, 18	17	4 ,, 46	1	12	1	12	51	
4 ,, 5	7	3 ,, 38	6	1 ,, 26	3	12 ,, 14	...	...	4	3 ,, 39	3	7 ,, 13	9	3 ,, 16	7	7 ,, 28	4	8 to 16	1	5	44	
5 ,, 10	23	2 ,, 28	23	3 ,, 28	6	2 ,, 11	5	6 to 19	11	5 ,, 12	3	9 ,, 18	15	3 ,, 21	17	2 ,, 20	13	2 ,, 24	1	2	117	
10 ,, 15	2	9 and 10	7	6 ,, 18	6	2 ,, 13	4	7 ,, 12	3	8 ,, 24	1	10	4	13 ,, 22	6	6 ,, 25	1	4	...	...	34	
15 ,, 20	...	...	...	...	1	O.A.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
20 and upwards ...	4	3 to 12	4	5 to 11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	
Total	48	...	58	...	20	...	9	...	27	...	14	...	44	...	53	...	22	...	3	...	298	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						46·7
WESTERN HOSPITAL.																						
Under 1	2	13 and 20	3	3 to 5	1	12	3	5 to 17	...	...	...	...	...	...	...	...	...	...	...	...	9	
1 to 2	13	1 to 62	7	3 ,, 15	2	13 and 15	1	17	3	6 to 45	...	...	...	...	2	5 and 11	1	3	...	...	29	
2 ,, 3	19	4 ,, 34	14	6 ,, 30	4	9 to 15	7	7 to 51	1	4	...	...	...	...	1	7	...	...	...	...	46	
3 ,, 4	29	6 ,, 21	18	6 ,, 34	3	11 ,, 23	7	2 ,, 18	5	2 to 26	1	2	2	5 and 22	1	2	1	10	...	...	67	
4 ,, 5	27	1 ,, 40	19	3 ,, 22	5	7 ,, 23	2	8 and 18	4	4 ,, 19	...	...	...	...	2	2 and 3	3	3 to 58	...	...	62	
5 ,, 10	35	6 ,, 27	25	1 ,, 56	2	11 and 12	12	1 to 18	7	3 ,, 50	...	...	...	...	6	4 to 10	4	2 ,, 12	...	...	91	
10 ,, 15	4	7 ,, 10	12	1 ,, 18	...	...	1	16	...	...	...	...	...	...	2	8 and 24	...	...	...	...	19	
15 ,, 20	3	7 ,, 13	2	4 and 23	...	...	...	...	...	...	...	...	...	...	...	...	2	7 and 68	...	...	7	
20 and upwards ...	4	5 ,, 16	5	8 to 10	1	11	2	1 and 17	...	...	...	...	...	...	...	...	...	...	...	...	12	
Total	136	...	105	...	18	...	35	...	20	...	1	...	2	...	14	...	11		...	...	342	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						55·7
EASTERN HOSPITAL.																						
Under 1	...	...	3	2 to 16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
1 to 2	2	5 and 14	7	4 ,, 21	...	...	...	...	...	...	...	...	3	7 to 14	1	9	...	...	...	...	13	
2 ,, 3	1	9	13	9 ,, 46	1	7	1	10	4	2 to 26	...	...	3	2 ,, 16	3	5 to 15	...	...	...	...	26	
3 ,, 4	2	8 and 12	19	2 ,, 24	1	31	1	10	3	4 ,, 8	...	...	2	8 and 11	2	5 and 9	...	...	...	...	30	
4 ,, 5	4	4 to 10	22	2 ,, 30	2	1 and 3	...	...	2	OA and 50	...	...	4	3 to 12	2	8 ,, 14	1	25	...	...	37	
5 ,, 10	5	4 ,, 15	43	2 ,, 28	5	2 to 9	...	...	9	3 to 63	...	...	18	4 ,, 15	1	19	1	9	...	...	82	
10 ,, 15	3	1 ,, 10	15	3 ,, 15	...	...	...	...	1	4	...	...	8	4 ,, 15	1	12	1	10	...	...	29	
15 ,, 20	1	10	3	1 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	
20 and upwards ...	2	9 and 10	5	9 ,, 39	...	...	...	...	2	4 and 22	...	...	...	...	1	10	...	...	...	...	10	
Total	20	...	130	...	9	...	2	...	21	...	...	...	38	...	11	...	3	...	...	...	234	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						47·6
SOUTH-EASTERN HOSPITAL.																						
Under 1	...	...	3	3 to 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
1 to 2	1	11	4	10 ,, 14	...	...	...	...	1	22	...	...	...	...	5	14 to 37	...	...	...	...	11	
2 ,, 3	6	2 to 50	10	2 ,, 90	...	...	...	...	1	4	...	...	...	...	...	...	...	...	...	...	17	
3 ,, 4	13	2 ,, 31	15	1 ,, 23	...	...	1	24	2	40 and 45	...	...	...	...	5	1 to 50	1	49	...	...	37	
4 ,, 5	17	4 ,, 19	16	5 ,, 45	...	...	2	15 and 19	3	6 to 52	...	...	4	7 to 54	2	17 and 24	2	6 and 50	...	...	46	
5 ,, 10	23	2 ,, 14	37	3 ,, 105	1	25	2	6 ,, 14	8	4 ,, 27	...	...	3	8 ,, 14	8	2 to 80	2	7 ,, 23	...	...	84	
10 ,, 15	9	8 ,, 18	10	1 ,, 15	1	11	...	...	3	21 ,, 36	...	...	1	5	2	9 and 14	...	...	...	...	26	
15 ,, 20	...	...	...	...	1	3	1	3	...	...	...	...	1	9	...	...	...	...	...	...	3	
20 and upwards ...	...	...	1	8	...	...	...	...	...	...	...	...	1	21	...	...	...	...	...	...	2	
Total	69	...	96	...	3	...	6	...	18	...	...	...	10	...	22	...	5		...	...	229	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						44·9

NOTE.—O.A. = On admission to Hospital.

Table XIa. (*continued*).—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The figures in the broader column refer to the lowest and highest number of days on which the rash appeared, not counting the day of injection.

1896.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxin Rash.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.	
SOUTH-WESTERN HOSPITAL.																						
Under 1	1	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
1 to 2	...	...	3	3 to 60	...	...	...	...	...	...	...	...	...	...	2	11 and 18	...	...	...	...	5	
2 ,, 3	12	3 to 27	6	3 ,, 22	...	...	...	...	1	18	...	...	...	...	1	17	1	33	...	...	21	
3 ,, 4	8	1 ,, 17	2	8 and 9	...	...	...	...	...	...	...	...	...	...	1	15	1	4	...	...	12	
4 ,, 5	9	3 ,, 17	1	12	...	...	...	...	1	8	...	...	1	13	...	...	...	...	...	...	12	
5 ,, 10	32	3 ,, 25	12	6 to 39	...	...	...	...	5	5 to 25	...	...	1	16	5	1 to 14	3	4 to 31	...	...	58	
10 ,, 15	7	8 ,, 15	4	6 ,, 26	...	...	...	...	1	13	...	...	...	...	1	14	...	...	...	...	13	
15 ,, 20	2	9 and 15	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
20 and upwards ...	...	...	2	12 and 13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	
Total	71	...	31	.	...	...	...	...	8	...	...	...	2	...	10	...	5	...	...	...	127	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						40·8
NORTH-WESTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	3	5 to 29	5	3 to 25	...	...	...	...	2	2 and 25	...	...	...	...	...	...	1	4	...	...	11	
2 ,, 3	5	2 ,, 17	2	5 and 14	...	...	...	...	...	...	...	...	...	...	...	...	2	15 and 54	...	...	9	
3 ,, 4	2	3 and 64	9	2 to 29	...	...	...	...	3	3 to 7	...	...	2	15 and 16	1	34	6	3 to 13	...	...	23	
4 ,, 5	3	5 to 12	6	8 ,, 19	...	...	...	...	3	14 ,, 59	...	...	...	...	3	5 to 7	3	8 ,, 32	...	...	18	
5 ,, 10	12	1 ,, 17	17	2 ,, 34	...	...	2	31 and 33	2	4 and 5	...	...	2	12 and 17	3	6 ,, 29	9	7 ,, 41	...	...	47	
10 ,, 15	...	...	...	...	...	...	...	...	2	15 ,, 16	...	...	1	11	...	...	1	14	...	...	4	
15 ,, 20	...	...	1	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	1	9	...	...	...	...	...	...	1	
Total	25	...	40	...	...	...	2	..	12	...	...	...	6	...	7	...	22	...	...	...	114	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						32·2
NORTH-EASTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	1	19	...	...	...	...	...	...	..	...	...	...	1	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	1	7	1	35	...	...	...	...	...	...	...	...	...	...	1	O.A.	...	...	...	...	3	
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	O.A.	...	...	1	
4 ,, 5	...	...	...	...	...	...	...	...	...	...	1	9	...	...	3	O.A.	...	...	...	...	4	
5 ,, 10	1	9	...	...	...	...	...	...	...	...	1	11	...	...	1	O.A.	...	...	...	...	3	
10 ,, 15	...	...	...	...	...	...	...	...	...	...	1	16	...	...	...	...	...	...	...	...	1	
15 ,, 20	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	...	...	1	
Total	2	...	1	...	...	...	...	...	1	...	3		1	...	5	...	1	...	...	...	14	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						77·7

Note.—O.A. = On admission to Hospital.

TABLE XIA. (*continued*).—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The figures in the broader column refer to the lowest and highest number of days on which the rash appeared, not counting the day of injection.

1896.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxin Rash.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.	
BROOK HOSPITAL.																						
Under 1	...	...	1	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
1 to 2	1	65	2	8 and 15	...	...	...	...	...	...	...	...	...	...	1	5	...	...	...	...	4	
2 ,, 3	...	...	1	13	...	...	...	...	...	...	...	...	...	...	1	20	...	...	...	...	2	
3 ,, 4	1	8	12	1 to 14	1	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	
4 ,, 5	2	15 and 105	7	2 ,, 18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	
5 ,, 10	6	7 to 16	27	2 ,, 13	1	7	...	...	2	10 and 15	...	...	1	10	3	2 to 11	1	50	...	...	41	
10 ,, 15	1	10	5	2 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	
15 ,, 20	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
20 and upwards...	...	...	2	11 and 12	...	...	...	...	...	...	...	...	1	14	...	...	...	...	...	...	3	
Total	12	...	57	...	2	...	...	...	2	...	...	...	2	...	5	...	1	50	...	...	81	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						47·3
NORTHERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	...	...	1	
3 ,, 4	4	7 to 19	...	...	3	6 to 10	...	...	...	...	...	...	3	10 to 14	2	3 and 8	...	...	...	...	12	
4 ,, 5	2	15 and 16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	3	...	...	3	
5 ,, 10	11	7 to 15	...	...	4	9 to 10	...	...	...	...	...	...	10	9 to 16	23	5 to 15	1	2	...	...	49	
10 ,, 15	11	7 ,, 14	...	...	...	...	...	...	...	...	...	...	...	...	10	2 to 30	...	...	...	...	21	
15 ,, 20	3	8 ,, 15	1	7	...	...	...	...	...	...	...	...	2	12 and 15	1	9	...	...	...	...	7	
20 and upwards...	...	...	1	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
Total	31	..	2	...	7	...	...	...	...	...	...	...	16	...	36		2	...	...	...	94	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						52·5
GORE FARM HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	1	
5 ,, 10	9	3 to 14	2	12 and 16	...	...	...	...	...	...	...	...	...	...	2	10 and 11	...	...	...	...	13	
10 ,, 15	2	9 and 14	2	11 ,, 12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total	11	...	4	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	18	
Percentage on total cases examined in which Diphtheria bacilli were found and in which Antitoxic Serum was injected																						31·5

TABLE XIIA.—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The figures in the broader column refer to the lowest and highest number of days on which the rash appeared, and are recorded as from the initial symptoms of the disease.

1895.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.	
FOUNTAIN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	2	9 and 12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	
2 „ 3	2	9 „ 17	...	...	2	6 and 18	...	...	...	...	...	...	1	2	...	...	1	8	6	
3 „ 4	2	7 „ 14	...	...	...	...	1	45	...	...	...	...	1	38	1	14	...	...	5	
4 „ 5	3	10 to 17	2	28 and 30	...	...	...	...	...	...	...	...	1	8	4	6 to 31	...	...	10	
5 „ 10	6	10 „ 20	5	8 to 65	1	5	...	...	1	15	1	19	...	...	1	18	...	...	15	
10 „ 15	4	9 „ 12	...	...	...	...	...	...	...	...	...	...	...	...	1	27	...	...	5	
15 „ 20	1	11	1	9	...	...	...	...	...	...	...	...	1	7	...	...	...	...	3	
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	2	16 and 36	...	...	...	...	2	
Total	20	...	8	...	3	...	1	...	1	...	1	...	6	...	7	...	1	...	48	
Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected																				12·0
WESTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	1	22	...	...	...	...	...	...	...	...	1	
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	1	36	...	...	...	...	1	
3 „ 4	1	11	1	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	
4 „ 5	1	17	1	7	...	...	...	...	...	...	...	...	...	...	1	41	...	...	3	
5 „ 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
10 „ 15	1	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
15 „ 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total	3	...	2	...	...	...	...	...	1	...	...	...	1	...	1	.	...	...	8	
Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected																				4·2
EASTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 „ 3	...	...	...	...	2	2 and 10	...	...	1	9	...	...	...	...	...	...	...	...	3	
3 „ 4	1	15	3	3 to 25	...	...	...	...	1	5	...	...	1	O A	1	O A	...	...	7	
4 „ 5	1	4	3	5 „ 20	...	...	...	...	3	3 to 24	...	...	2	2 and 5	...	...	...	...	9	
5 „ 10	...	...	8	3 „ 34	3	5 to 13	...	...	6	2 „ 30	...	...	4	3 to 10	4	O A to 2	...	...	25	
10 „ 15	...	...	3	3 „ 9	2	15 and 39	...	...	5	3 „ 14	...	...	3	2 „ 4	3	4 „ 9	...	...	16	
15 „ 20	...	...	4	2 „ 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	
20 and upwards...	1	7	3	3 „ 7	1	54	...	...	...	...	...	...	1	O A	...	...	...	...	6	
Total	3		24	...	8	...	...	...	16	...	...	...	11	...	8	...	...	...	70	
Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected																				17·2
SOUTH-EASTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
3 „ 4	...	...	...	...	...	...	...	...	...	...	...	...	1	24	...	...	...	...	1	
4 „ 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
5 „ 10	1	27	...	...	...	...	...	...	1	99	...	...	...	...	...	...	...	...	2	
10 „ 15	...	...	1	17	...	...	...	...	...	...	...	...	1	2	...	...	...	...	2	
15 „ 20	...	...	1	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
20 and upwards...	1	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
Total	2	...	2	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	7	
Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected																				7·4

NOTE.—O A. = On admission to Hospital.

TABLE XIIA. (*continued*).—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The figures in the broader column refer to the lowest and highest number of days on which the rash appeared, and are recorded as from the initial symptoms of the disease.

1895.

SOUTH-WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	3	9 to 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... 2·8

NORTH-WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	13 to 45	...	...	3
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	3	6 to 36	1	17	...	...	4
4 ,, 5	...	...	...	...	...	...	...	...	...	...	1	55	...	...	...	...	1	5	2
5 ,, 10	1	4	1	9	...	...	...	...	2	6 and 38	...	...	4	6 to 40	2	10 and 15	...	...	10
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	...	1	...	...	...	...	...	2	...	1	...	7	...	6		1	...	19

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... 5·4

NORTH-EASTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	1	78	...	...	...	...	...	...	...	...	...	...	1	19	...	...	...	...	2
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	3	1 to 6	...	...	...	...	3
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	3	4 to 17	...	...	...	...	3
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...	...	...	8

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... 13·7

NORTHERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	16 and 40	...	...	2
4 ,, 5	...	...	...	...	...	...	...	...	1	O. A.	...	...	...	...	...	...	...	...	1
5 ,, 10	1	15	...	...	...	...	...	...	...	...	...	...	...	...	3	7 to 14	...	...	4
1 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	...	...	...	...	...	...	...	1	...	...	...	...	...	5	...	...	...	7

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... 5·7

NOTE.—O.A. = On admission to Hospital.

TABLE XIIA. (*continued*).—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The figures in the broader column refer to the lowest and highest number of days on which the rash appeared, and are recorded as from the initial symptoms of the disease.

1896.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.	
FOUNTAIN HOSPITAL.																		
Under 1	1	O.A.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
1 to 2	...	...	1	O.A.	...	...	...	...	2	4 and 10	1	O.A.	...	...	...	...	4	
2 ,, 3	...	...	2	O.A. and 4	...	...	...	...	1	O.A.	...	...	2	O.A. and 8	...	...	5	
3 ,, 4	...	...	...	...	...	...	...	...	6	O.A. to 8	1	8	2	6 and 58	...	...	9	
4 ,, 5	...	...	1	13	...	...	...	...	2	O.A. and O.A.	1	5	10	4 to 104	...	...	4	
5 ,, 10	2	O.A. and 14	4	2 to 34	...	...	...	...	17	6 to 63	4	2 to 4	1	O.A.	...	...	37	
10 ,, 15	1	15	...	...	2	6 and 35	...	...	6	4 to 42	2	O.A. and 6	1	O.A.	...	...	12	
15 ,, 20	...	...	...	...	...	...	...	...	1	O.A.	1	O.A.	...	...	...	...	3	
20 and upwards...	1	8	1	O.A.	...	...	...	...	...	...	1	5	...	...	...	...	3	
Total	5	...	9	...	2	...	...	...	35	...	11	...	16	...	...	...	78	
Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected																		25·4
WESTERN HOSPITAL.																		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	1	10	...	...	2	10 and 11	...	...	3	
2 ,, 3	...	...	1	15	...	...	...	...	...	...	...	...	...	...	...	...	1	
3 ,, 4	...	...	1	20	...	...	...	...	2	10 and 11	...	...	...	...	...	...	3	
4 ,, 5	...	...	2	9 and 22	...	...	...	...	1	10	...	...	...	...	...	...	3	
5 ,, 10	...	...	4	1 to 31	2	10 and 11	...	...	4	9 to 10	1	10	1	10	...	...	12	
10 ,, 15	1	14	5	8 to 37	...	...	1	10	...	...	...	...	...	...	...	...	7	
15 ,, 20	...	...	1	10	...	...	...	...	...	...	...	...	...	...	...	...	1	
20 and upwards...	...	...	1	10	1	5	1	31	...	...	1	10	...	...	...	...	4	
Total	1	...	15	...	3	...	2	...	8	...	2	...	3	...	...	...	34	
Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected																		12·5
EASTERN HOSPITAL.																		
Under 1	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	.	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	1	8	4	10 to 24	...	...	...	...	3	2 to 8	...	...	1	O.A.	...	...	9	
3 ,, 4	...	...	2	10 and 11	...	...	...	...	1	O.A.	...	...	1	O.A.	...	...	4	
4 ,, 5	...	...	5	O.A. to 18	...	...	...	...	3	O.A.	1	85	1	O.A.	...	...	10	
5 ,, 10	...	...	8	10 to 35	2	O.A. and 40	...	...	6	4 to 10	...	...	7	O.A. to 10	...	...	23	
10 ,, 15	...	...	4	O.A. to 30	2	O.A. ,, 5	...	...	2	O.A. and O.A.	1	10	3	O.A. to 12	...	...	12	
15 ,, 20	...	...	1	10	...	...	...	...	...	...	...	...	...	...	...	...	1	
20 and upwards...	1	10	...	...	...	...	...	...	1	18	1	10	1	37	...	...	4	
Total	2	...	24	...	4	...	...	...	16	...	3	...	14	...	...	...	63	
Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected																		26·9
SOUTH-EASTERN HOSPITAL.																		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	1	23	...	...	...	...	...	...	1	125	...	...	...	...	...	...	2	
2 ,, 3	...	...	1	14	...	...	...	...	1	O.A.	1	7	2	O.A. and 10	...	...	5	
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
4 ,, 5	1	53	1	6	...	...	...	...	7	54 to 105	...	...	...	...	...	...	9	
5 ,, 10	4	10 to 57	3	9 to 20	...	...	...	...	6	3 ,, 5	...	...	...	...	...	...	13	
10 ,, 15	...	...	3	9 to 26	...	...	...	...	3	O.A. to 6	...	...	1	O.A.	...	...	7	
15 ,, 20	...	...	2	7 and 10	...	...	...	...	1	O.A.	...	...	...	...	...	...	3	
20 and upwards...	1	45	...	...	1	6	...	...	1	6	...	...	1	11	...	...	4	
Total	7	...	10	...	1	...	...	...	20	...	1	...	4	...	...	...	43	
Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected																		22·5

NOTE.—O.A. = On admission to Hospital.

TABLE XIIA. (*continued*).—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The figures in the broader column refer to the lowest and highest number of days on which the rash appeared, and are recorded as from the initial symptoms of the disease.

1896

SOUTH-WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	1	5	...	...	...	...	1
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	1	4	...	...	1	22	...	...	2
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	1
5 ,, 10	1	12	2	6 and 7	...	...	...	...	1	36	2	2 and 6	1	2	...	...	7
10 ,, 15	...	...	4	5 to 18	1	6	...	...	...	...	...	...	...	...	...	...	5
15 ,, 20	1	6	2	5 and 6	...	...	...	...	...	...	...	...	...	...	...	...	3
20 and upwards...	...	...	3	5 to 8	...	...	...	...	...	...	...	...	1	8	...	...	4
Total	2	...	11	...	1	...	...	...	2	...	3	...	4	...	...	...	23

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... ... 13·5

NORTH-WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	1	5	...	...	...	...	...	...	1
1 to 2	...	...	...	...	...	...	...	...	1	9	1	3	1	12	...	...	3
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	2	15 and 35	1	8	3
3 ,, 4	1	14	...	...	...	...	...	...	2	5 and 13	2	3 and 7	3	4 to 24	...	...	8
4 ,, 5	...	...	2	8 and 56	...	...	...	...	1	12	3	6 to 14	5	5 ,, 49	...	...	11
5 ,, 10	...	...	1	19	...	...	...	...	6	3 to 23	1	23	8	8 ,, 35	...	...	16
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	1	11	...	...	1
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	1	47	...	...	1
Total	1	...	3	...	...	...	...	...	11	...	7	...	21	...	1	...	44

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... ... 11·6

NORTH-EASTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	1	O. A.	...	...	1
2 ,, 3	...	...	...	...	...	...	...	...	...	...	1	O. A.	...	...	...	...	1
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	1	O. A.	...	...	1
4 ,, 5	...	...	...	...	...	...	...	...	...	...	1	O. A.	1	O. A.	...	...	2
5 ,, 10	...	...	...	...	...	...	...	...	...	...	1	O. A	3	O. A.	...	...	4
10 ,, 15	...	...	...	...	...	...	...	...	1	O. A.	...	...	2	O.A.andO.A.	...	...	3
15 ,, 20	...	...	...	...	...	...	...	...	...	...	2	O. A. and 2	...	...	...	...	2
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	1	O. A.	...	...	1
Total	...	...	...	...	...	...	...	...	1	...	5	...	9	...	...	...	15

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... ... 51·7

NOTE.—O. A. = On admission to Hospital.

TABLE XIIA. (*continued*).—Nature and number of Rashes found in cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The figures in the broader columns refer to the lowest and highest number of days on which the rash appeared, and are recorded as from the initial symptoms of the disease.

1896.

BROOK HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	1	10	...	...	1	3	...	...	2
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	1	10	...	...	...	...	...	...	...	...	...	...	...	...	1
4 ,, 5	...	...	1	10	...	...	...	...	1	10	...	...	...	...	...	...	2
5 ,, 10	...	...	6	6 to 13	...	...	...	...	1	10	...	...	...	...	...	...	7
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	1	55	...	...	...	...	1
20 and upwards...	...	...	2	10 and 14	...	...	...	...	...	...	...	...	...	...	...	...	2
Total	...	...	10	...	...	...	...	...	3	...	1	...	1	...	...	...	15

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... 28·3

NORTHERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	1	55	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	1	35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	1
15 ,, 20	...	...	...	...	...	...	...	...	...	...	1	25	...	...	...	...	1
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	2	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	4

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... 5·5

GORE FARM HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	1
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1

Percentage on total cases examined in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected ... 4·1

TABLE XIIIA.—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, but which were injected with Antitoxic Serum. The figures in the broader columns refer to the lowest and highest number of days on which the rash appeared after the injection of the Antitoxic Serum, not counting day of injection.

1895.

FOUNTAIN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	1	7	...	...	...	...	...	...	...	...	...	...	1	21	...	...	...	...	2
3 ,, 4	2	14 and 17	...	...	...	...	...	...	1	3	...	...	...	...	...	...	...	...	3
4 ,, 5	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
5 ,, 10	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	...	...	1
10 ,, 15	2	7 and 9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
15 ,, 20	1	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	7	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	10
Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected																			37·03

WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	3	8 to 10	1	O.A.	...	...	1	11	...	...	...	...	...	...	...	...	...	...	5
2 ,, 3	3	O.A. to 10	...	...	...	...	1	10	...	...	...	...	...	...	1	10	...	...	5
3 ,, 4	3	8 ,, 16	...	...	...	...	1	15	...	...	...	...	...	...	...	...	...	...	4
4 ,, 5	...	...	...	...	...	...	1	7	...	...	...	...	...	...	...	...	...	...	1
5 ,, 10	5	8 to 14	1	9	...	...	1	15	...	...	1	8	...	...	1	13	...	...	9
10 ,, 15	...	...	2	7 and 13	...	...	1	7	...	...	...	...	...	...	...	...	...	...	3
15 ,, 20	1	22	...	...	1	9	...	...	...	...	...	...	...	...	...	...	...	...	2
20 and upwards...	1	15	2	12 and 13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Total	16	...	6	...	1	...	6	...	...	...	1	...	...	...	2	...	...	...	32
Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected																			43·8

EASTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Total.
Under 1	1	13	...	...	...	...	...	...	1	3	...	...	...	...	...	...	...	...	2
1 to 2	...	...	1	1	...	...	...	...	...	...	...	...	1	15	...	...	...	...	2
2 ,, 3	2	4 and 10	...	...	...	...	...	...	...	...	...	...	1	7	...	...	...	...	3
3 ,, 4	1	4	...	...	...	...	...	...	...	...	...	...	1	15	...	...	...	...	2
4 ,, 5	3	O.A. to 12	4	6 to 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
5 ,, 10	2	7 and 17	3	7 to 10	...	...	...	...	...	...	...	...	2	8 and 9	1	19	...	...	8
10 ,, 15	...	...	1	9	1	12	...	...	...	...	...	...	1	12	...	...	...	...	3
15 ,, 20	...	...	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	9	...	10	...	1	12	...	...	1	3	...	...	6	...	1	19	...	...	28
Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected																			45·9

NOTE.—O.A. = On admission to Hospital.

TABLE XIIIA. (*continued*).—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, but which were injected with Antitoxic Serum. The figures in the broader columns refer to the lowest and highest number of days on which the rash appeared after the injection of the Antitoxic Serum, not counting day of injection.

1895.

SOUTH-EASTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Total.
Under 1	1	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
1 to 2	2	4 and 8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
2 ,, 3	...	...	...	...	...	...	1	3	...	...	...	...	...	...	1	2	...	...	2
3 ,, 4	3	6 to 14	3	7 to 15	...	...	1	15	...	...	...	...	...	...	1	17	...	...	8
4 ,, 5	1	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
5 ,, 10	7	5 to 10	6	4 to 23	...	...	...	...	...	...	1	4	...	...	2	4 and 15	...	...	16
10 ,, 15	5	8 ,, 10	3	2 ,, 12	...	...	...	...	...	...	...	...	...	...	1	5	...	...	9
15 ,, 20	5	8 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
20 and upwards...	6	7 ,, 27	1	10	...	...	...	...	1	2	1	9	...	...	...	...	...	...	9
Total	30	...	13	...	...	...	2	...	1	...	2	...	...	...	5	...	...	...	53

Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected 59.5

SOUTH-WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	2	10 and 11	...	...	...	...	...	...	1	2	...	...	...	...	...	...	...	...	3
3 ,, 4	4	4 to 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
4 ,, 5	3	9 ,, 17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
5 ,, 10	7	7 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
10 ,, 15	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	17	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	18

Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected ... ... 46·1

NORTH-WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	10	1	3	2
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	5	1
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	1
Total	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	2	...	4

Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected ... ... 9·5

Table XIIIa. (*continued*).—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, but which were injected with Antitoxic Serum. The figures in the broader columns refer to the lowest and highest number of days on which the rash appeared after the injection of the Antitoxic Serum, not counting day of injection.

1896.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxin Rash.		Rash (no description).		Scarlet Fever Rash		Septic Rash.		Total.	
FOUNTAIN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	2	O.A.& 10	...	...	1	O.A.	...	...	...	...	1	15	...	...	...	...	4	
2 ,, 3	...	...	1	8	1	4	...	...	1	12	1	2	2	11 and 14	...	...	...	...	...	...	6	
3 ,, 4	...	...	...	...	...	...	...	...	2	6 and 10	...	...	...	...	1	8	2	O.A.& 19	1	7	6	
4 ,, 5	1	20	2	O.A. & 17	1	3	...	...	...	...	...	...	2	13 and 14	...	...	1	2	...	...	7	
5 ,, 10	5	8 to 14	1	14	1	13	1	8	1	O.A.	2	10 and 11	2	3 ,, 10	2	6 and 13	2	O.A.&O.A.	...	...	17	
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	1	10	1	13	...	...	...	...	2	
15 ,, 20	1	8	...	...	...	...	...	...	...	...	...	...	1	8	...	...	...	...	...	...	2	
20 and upwards...	2	7 and 8	1	10	...	...	...	...	...	...	...	...	1	11	...	...	...	...	...	...	4	
Total	9	...	5	...	5	...	1	...	5	...	3		9	...	5	...	5	...	1	7	48	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected																						55·1
WESTERN HOSPITAL.																						
Under 1	1	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
1 to 2	2	5 and 14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	
2 ,, 3	1	7	...	...	...	...	2	9 and 14	1	9	...	...	...	...	...	...	...	...	...	...	4	
3 ,, 4	...	...	1	7	...	...	1	14	2	10 and 11	1	5	...	...	...	...	...	...	...	...	5	
4 ,, 5	3	8 to 12	1	10	1	11	1	3	1	10	...	...	...	...	...	...	...	...	...	...	7	
5 ,, 10	7	2 ,, 21	2	7 and 10	1	O.A.	...	...	8	2 to 22	...	...	...	...	...	...	1	O.A.	...	...	19	
10 ,, 15	1	10	2	8 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
15 ,, 20	...	...	...	...	...	...	1	5	...	...	...	...	...	...	...	...	...	...	...	...	1	
20 and upwards...	2	5 and 6	1	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
Total	17	...	7	...	2	...	5	...	12	...	1	...	...	...	...	...	1		...	...	45	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected																						65·2
EASTERN HOSPITAL.																						
Under 1	...	...	1	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
1 to 2	...	...	2	10 and 15	...	...	...	...	1	10	...	...	1	16	...	...	...	...	...	...	4	
2 ,, 3	1	8	2	6 ,, 10	...	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	4	
3 ,, 4	...	...	...	...	1	2	...	...	2	15 and 16	...	...	...	...	...	...	2	3 and 10	...	...	5	
4 ,, 5	...	...	2	11 and 13	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
5 ,, 10	...	...	6	8 to 11	...	...	...	...	2	4 and 10	...	...	1	9	...	...	...	...	...	...	9	
10 ,, 15	...	...	1	10	...	...	...	...	1	2	...	...	...	...	...	...	1	2	...	...	3	
15 ,, 20	...	...	1	14	...	...	...	...	1	10	...	...	...	...	...	...	...	...	...	...	2	
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total	1	...	15	...	2	...	...	...	8	...	...	...	2	...	...	...	3	...	...	...	31	
Percentage on total cases examined in which no Diphtheria bacilli were found, and in which Antitoxic Serum was injected																						56·3
SOUTH-EASTERN HOSPITAL.																						
Under 1	1	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	12	...	...	2	
1 to 2	1	3	...	...	1	5	...	...	1	3	...	...	...	...	...	...	...	...	...	...	3	
2 ,, 3	1	10	3	6 to 20	...	...	...	...	2	O.A. and 4	...	...	...	...	...	...	1	56	...	...	7	
3 ,, 4	3	4 to 12	...	...	1	4	1	5	2	3 ,, 5	...	...	...	...	...	...	...	...	...	...	7	
4 ,, 5	1	13	3	1 to 10	2	8 and 23	1	19	1	24	...	...	...	...	1	13	...	...	...	...	9	
5 ,, 10	3	4 to 13	5	2 ,, 18	1	11	1	18	2	1 and 5	...	...	...	...	...	...	1	8	...	...	13	
10 ,, 15	1	12	5	2 ,, 13	2	5 and 12	1	2	...	...	...	...	...	...	...	...	...	...	...	...	9	
15 ,, 20	...	...	...	...	...	...	...	...	1	5	...	...	...	...	...	...	1	2	...	...	2	
20 and upwards...	1	2	1	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	
Total	12	...	17	...	7	...	4	...	9		...	...	...	...	1	..	4	...	...	...	54	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected																						64·2

Note.—O.A. = On admission to Hospital.

TABLE XIIIA. (*continued*).—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, but which were injected with Antitoxic Serum. The figures in the broader columns refer to the lowest and highest number of days on which the rash appeared after the injection of the Antitoxic Serum, not counting day of injection.

1896.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.	
SOUTH-WESTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	1	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
2 ,, 3	1	13	...	...	...	...	...	...	1	10	...	...	...	...	...	...	...	...	...	...	2	
3 ,, 4	1	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
5 ,, 10	2	7 and 12	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
10 ,, 15	...	...	...	...	...	...	...	...	1	2	...	...	...	...	...	...	1	19	...	...	2	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total	5	...	1	...	...	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	9	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected																						47·3
NORTH-WESTERN HOSPITAL.																						
Under 1	1	7	...	...	...	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	2	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	1	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	4	...	...	2	
3 ,, 4	...	...	1	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
5 ,, 10	2	12 and 18	...	...	...	...	...	...	1	7	...	...	...	...	...	...	1	5	...	...	4	
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
15 ,, 20	...	...	1	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total	4	...	2	...	...	...	...	...	2	...	...	...	...	...	...	...	2	...	...	...	10	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected																						23·8
NORTH-EASTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	O.A.	...	...	...	...	1	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	O.A.	...	...	...	...	1	
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
4 ,, 5	2	2 and 15	1	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total	2	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	5	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected																						83·3

NOTE.—O.A. = On admission to Hospital.

TABLE XIIIA. (*continued*).—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, but which were injected with Antitoxic Serum. The figures in the broader columns refer to the lowest and highest number of days on which the rash appeared after the injection of the Antitoxic Serum, not counting day of injection.

1896.

BROOK HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	...	...	1
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	1	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
4 ,, 5	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
5 ,, 10	...	...	2	4 and 35	...	...	...	...	1	3	...	...	...	...	...	...	...	...	...	...	3
10 ,, 15	...	...	2	O. A. and 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
15 ,, 20	...	...	1	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	...	6	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	9

Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected ... ... 52·9

NORTHERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	8	...	...	...	...	1
4 ,, 5	1	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
5 ,, 10	2	4 and 11	...	...	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
10 ,, 15	4	9 to 13	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	...	...	5
15 ,, 20	1	9	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	2
20 and upwards...	1	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Total	9	...	...	...	1	...	...	...	...	...	...	...	1	...	2	...	...	...	...	...	13

Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected ... ... 48·1

GORE FARM HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Antitoxic Rash.		Rash (no description).		Scarlet Fever Rash.		Septic Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	1	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
5 ,, 10	...	...	2	10 and 12	...	...	...	...	...	...	...	...	...	...	1	3	...	...	...	...	3
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	1	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Total	1	...	3	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	5

Percentage on total cases examined in which no Diphtheria bacilli were found and in which Antitoxic Serum was injected ... ... 45·4

NOTE.—O. A. = On admission to Hospital.

TABLE XIVA.—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, and in which no Antitoxic Serum was injected.
The figures refer to the lowest and highest number of days on which rash appeared, and are recorded as from the initial (?) symptoms of the disease.

1895.

FOUNTAIN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Total.	
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	...	...	1	?	...	...	...	...	2	?	1	14	...	...	4	
3 ,, 4	...	...	1	12	...	...	...	...	1	?	...	...	...	...	2	
4 ,, 5	...	...	...	...	...	...	...	...	...	...	2	? and 2	...	...	2	
5 ,, 10	1	?	...	...	...	...	...	...	3	?	6	? to 2	1	?	11	
10 ,, 15	...	...	2	? and O.A.	...	...	...	...	2	? and ?	...	...	1	O.A.	5	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	1	3	1	2	2	
20 and upwards	...	...	...	...	...	...	...	...	1	?	...	...	...	...	1	
Total	1	..	4	...	...	...	...	...	9	...	10	...	3	...	27	
Percentage on total cases examined in which no Diphtheria bacilli were found but in which no Antitoxic Serum was injected																12·5

WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Total.	
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	1	12	...	...	1	
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
3 ,, 4	...	...	1	19	...	...	1	15	1	4	...	...	...	...	3	
4 ,, 5	...	...	...	...	...	...	...	...	...	...	1	7	...	...	1	
5 ,, 10	...	...	1	19	...	...	...	...	...	...	...	...	...	...	1	
10 ,, 15	1	10	...	...	...	...	...	...	...	...	...	...	1	10	2	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards	...	...	1	11	...	...	...	...	1	10	...	...	...	...	2	
Total	1	...	3	...	...	...	1	...	2	...	2	...	1	...	10	
Percentage on total cases examined in which no Diphtheria bacilli were found but in which no Antitoxic Serum was injected																6·09

EASTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Total.	
Under 1	...	...	2	?	1	2	...	...	...	...	...	...	...	...	3	
1 to 2	...	...	...	...	...	...	...	...	3	?	...	...	...	...	3	
2 ,, 3	...	...	1	?	...	...	...	...	1	?	1	?	...	...	3	
3 ,, 4	...	...	1	?	1	?	...	...	1	?	...	...	1	?	4	
4 ,, 5	...	...	...	...	...	...	...	...	1	?	...	...	...	...	1	
5 ,, 10	...	...	...	...	...	...	2	?	5	?	...	...	2	?	9	
10 ,, 15	...	...	3	?	1	?	...	...	2	?	3	?	1	?	10	
15 ,, 20	...	...	3	?	...	...	...	...	1	?	...	...	...	...	4	
20 and upwards	...	...	1	?	...	...	...	...	...	...	...	...	...	...	1	
Total	...	...	11	...	3	...	2	...	14	...	4	...	4	...	38	
Percentage on total cases examined in which no Diphtheria bacilli were found but in which no Antitoxic Serum was injected																14·5

NOTE.—O.A. = Onset on admission to Hospital.

Table XIVa. (*continued*).—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, and in which no Antitoxic Serum was injected. The figures in the broader columns refer to the lowest and highest number of days on which rash appeared, and are recorded as from the initial (?) symptoms of the disease.

1895.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Rash (no description).		Scarlet Fever Rash.		Total.	
SOUTH-EASTERN HOSPITAL.																
Under 1	...	...	...	...	...	...	...	...	1	?	...	...	...	...	1	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	
2 ,, 3	...	...	1	?	...	...	...	...	...	...	...	...	1	O.A.	2	
3 ,, 4	...	...	...	...	...	...	...	...	1	4	...	...	...	...	1	
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	2	O.A.	2	
5 ,, 10	...	...	...	...	...	...	...	...	1	O.A.	1	?	2	O.A.	4	
10 ,, 15	...	...	...	...	1	O.A.	...	...	...	...	...	...	4	O.A. to 2	5	
15 ,, 20	...	...	...	...	...	...	...	...	1	3	...	...	...	...	1	
20 and upwards	...	...	1	O.A.	...	...	...	...	...	...	...	...	1	O.A.	2	
Total	...	...	2		1	..	...	...	4	...	1	...	10	...	18	
Percentage on total cases examined in which no Diphtheria bacilli were found but in which no Antitoxic Serum was injected																13·7
NORTH-WESTERN HOSPITAL.																
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	1	?	1	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	...	...	...	...	...	...	1	?	...	...	1	3	...	...	2	
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
4 ,, 5	1	?	...	...	...	...	...	...	...	...	...	...	...	...	1	
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	2	?	2	
10 ,, 15	...	...	...	...	...	...	...	...	...	...	1	11	...	...	1	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	1	23	...	...	1	
20 and upwards	1	25	...	...	...	...	...	...	...	...	1	?	1	12	3	
Total	2	...	...	...	...	...	1	...	...	...	4	...	4	...	11	
Percentage on total cases examined in which no Diphtheria bacilli were found but in which no Antitoxic Serum was injected																8·3
NORTHERN HOSPITAL.																
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	1	?	1	
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	1	4	1	
5 ,, 10	1	?	...	...	...	...	...	...	...	...	...	...	3	?	4	
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total	1	?	...	...	...	...	...	...	...	...	...	...	5	? to 4	6	
Percentage on total cases examined in which no Diphtheria bacilli were found but in which no Antitoxic Serum was injected																10·3

Note.—O.A. = Onset on admission to Hospital.

TABLE XIVA. (*continued*).—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, and in which no Antitoxic Serum was injected. The figures in the broader columns refer to the lowest and highest number of days on which rash appeared, and are recorded as from the initial (?) symptoms of the disease.

1896.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Total.	
FOUNTAIN HOSPITAL.																		
Under 1	...	...	1	O. A.	...	...	...	...	...	...	...	...	...	...	1	O.A.	2	
1 to 2	...	...	...	...	1	25	...	...	...	...	...	...	...	...	1	O.A.	2	
2 ,, 3	...	...	1	4	...	...	...	...	...	...	...	...	1	3	3	O.A. to 5	5	
3 ,, 4	...	...	...	...	2	O.A. & 17	...	...	2	O.A. & 33	...	...	1	O.A.	1	O.A.	6	
4 ,, 5	...	...	...	...	2	O.A. & 9	1	O. A.	1	O. A.	...	...	1	O.A.	...	...	5	
5 ,, 10	2	10 & 20	2	O.A. & O.A.	3	O. A	...	...	3	O. A.	...	...	11	5 to 6	19	O.A.	40	
10 ,, 15	1	O. A.	...	...	...	...	...	...	6	O. A.	...	...	4	3 to 21	11	O.A.	22	
15 ,, 20	...	...	...	...	...	...	...	...	1	O. A.	...	...	2	O. A. & 29	4	O. A. to 3	7	
20 and upwards	...	...	2	O. A. & O. A.	2	5 & 20	...	...	...	...	...	...	2	O. A. & O. A.	2	O. A. & O. A.	8	
Total	3	...	6		10	...	1	...	13	...	...	...	22	...	42	...	97	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected																	...	35·9
WESTERN HOSPITAL.																		
Under 1	...	...	...	...	...	...	1	5	...	...	...	...	...	...	...	...	1	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	...	...	1	12	1	?	...	...	...	...	...	...	...	...	...	...	2	
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	?	1	
4 ,, 5	...	...	1	?	...	...	...	...	3	? to 30	...	...	1	?	1	?	6	
5 ,, 10	...	...	2	? & ?	1	4	...	...	10	? to 11	1	7	3	1 to 17	3	? to 42	20	
10 ,, 15	...	...	...	...	...	...	2	? & ?	2	? & ?	...	...	1	?	4	? to 7	9	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards	...	...	...	...	3	O.A.	...	...	...	...	...	...	...	...	...	...	3	
Total	...	...	4	...	5	...	3	...	15	..	1	...	5	..	9	...	42	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected																	...	19·2
EASTERN HOSPITAL.																		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	1	42	2	? & O.A.	3	
2 ,, 3	...	...	3	? to 4	...	...	...	...	2	? & 2	...	...	...	...	1	24	6	
3 ,, 4	...	...	1	5	...	...	...	...	7	? to O.A.	...	...	...	...	2	? & O.A.	10	
4 ,, 5	...	...	...	...	...	...	...	...	2	? & ?	...	...	2	? & 11	3	?	7	
5 ,, 10	...	...	4	? to 2	2	? & O.A.	...	...	8	? to 11	...	...	...	...	10	? to O.A.	24	
10 ,, 15	...	...	4	? to 8	...	...	...	...	11	O.A. to 1	...	...	2	? & O.A.	6	?	23	
15 ,, 20	...	...	1	?	...	...	...	...	2	? & ?	...	...	...	...	2	? & ?	5	
20 and upwards	...	...	1	2	...	...	...	...	1	?	...	...	1	?	...	...	3	
Total	...	...	14	...	2	...	...	...	33	...	...	...	6	..	26	...	81	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected																	...	30·1
SOUTH-EASTERN HOSPITAL.																		
Under 1	...	...	...	...	...	...	1	5	...	...	...	...	...	...	...	...	1	
1 to 2	...	...	...	...	...	...	1	13	4	1 to 4	...	...	...	...	...	...	5	
2 ,, 3	...	...	1	26	...	...	...	...	1	4	...	...	1	O.A.	1	2	4	
3 ,, 4	2	12 & 13	...	...	...	...	1	15	2	O.A. & 4	...	...	...	...	2	4 & 8	7	
4 ,, 5	...	...	...	...	1	14	...	...	3	2 to 5	...	...	1	8	4	3 to 57	9	
5 ,, 10	1	29	2	O.A. & 11	3	5 to 26	...	...	5	3 to 13	...	...	...	...	10	2 to 6	21	
10 ,, 15	...	...	1	5	1	23	...	...	...	...	1	6	...	...	9	3 to 10	12	
15 ,, 20	...	...	2	8 & 16	...	...	...	...	...	...	...	...	1	5	3	2 to 7	6	
20 and upwards	...	...	2	O.A. & 5	...	...	1	13	...	...	...	...	1	5	3	3 to 6	7	
Total	3	...	8	...	5	...	4	...	15	...	1	...	4	...	32		72	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected																	...	37·8

NOTE.—O.A. = Onset on admission to Hospital.

TABLE XIVA. (*continued*).—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, and in which no Antitoxic Serum was injected. The figures refer to the lowest and highest number of days on which rash appeared, and are recorded as from the initial (?) symptoms of the disease.

1896.

SOUTH-WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Total.	
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	...	...	...	...	...	...	...	...	2	? and 39	1	9	...	...	...	...	3	
3 ,, 4	...	...	2	18 and 27	...	...	...	...	...	...	...	...	1	23	...	...	3	
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
5 ,, 10	1	?	...	...	...	...	...	...	4	O.A. to 17	...	...	...	...	1	11	6	
10 ,, 15	1	?	1	?	...	...	...	...	...	...	...	...	...	...	...	...	2	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards...	...	...	1	?	...	...	...	...	1	O.A.	...	...	...	...	...	...	2	
Total	2	...	4	...	...	...	..	...	7	...	1	...	1	...	1	...	16	...
Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected																		13·9

NORTH-WESTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Total.	
Under 1	1	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
2 ,, 3	...	...	1	7	...	...	...	...	1	6	...	...	...	...	...	...	2	
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	2	? and ?	...	...	2	
4 ,, 5	1	16	2	? and 14	...	...	...	...	...	...	...	...	3	2 to 7	...	...	6	
5 ,, 10	2	3 and 16	...	...	...	...	...	...	...	...	...	...	3	2 ,, 3	1	?	6	
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20 and upwards...	...	...	...	...	1	?	...	...	...	...	...	...	...	...	2	? and 2	3	
Total	4	...	3	...	1	...	...	...	1	...	...	...	...	...	3	...	20	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected																		13·9

NORTH-EASTERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Total.	
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	1	O.A.	...	...	1	
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	1	O.A.	...	...	1	
3 ,, 4	...	...	1	29	...	...	...	...	...	...	...	...	2	O.A. and O.A.	...	...	3	
4 ,, 5	1	60	...	...	...	...	...	...	...	...	...	...	3	O.A. to 33	...	...	4	
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	6	O.A.	...	...	6	
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	10	O.A.	...	...	10	
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	2	O.A. and O.A	...	...	2	
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	1	O.A.	...	...	1	
Total	1	...	1	...	...	...	...	...	...	...	...	...	26	...	...	...	28	
Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected																		50·9

NOTE.—O.A. = On admission to Hospital.

Table XIVa. (*continued*).—Nature and number of Rashes found in cases, at different ages, in which no Diphtheria bacilli were found, and in which no Antitoxic Serum was injected. The figures refer to the lowest and highest number of days on which rash appeared, and are recorded as from the initial (?) symptoms of the disease.

1896.

BROOK HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	1	?	...	...	...	...	...	...	1
3 ,, 4	...	...	1	?	...	...	...	...	...	...	...	...	...	...	...	...	1
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	3	O.A. to ?	...	...	...	...	2	3 and ?	...	...	...	...	1	?	6
10 ,, 15	...	...	1	?	1	9	...	...	...	...	...	...	...	...	...	...	2
15 ,, 20	...	...	...	...	...	...	...	...	2	? and ?	...	...	...	...	...	...	2
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	5	...	1	...	...	...	5	...	...	...	...	...	1	...	12

Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected ... 32·4

NORTHERN HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	?	1
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1

Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected ... 2·4

GORE FARM HOSPITAL.

Ages.	Urticaria.		Erythema.		Papular.		Macular Erythema.		Punctiform Erythema.		Blotchy.		Rash (no description).		Scarlet Fever Rash.		Total.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	1	?	...	...	...	...	...	...	...	...	...	...	...	...	1
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1

Percentage on total cases examined in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected ... 11·1

Note.—O.A. = On admission to Hospital.

TABLE XVA.—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The days on which these Paralyses made their appearance are recorded as from initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered, the second with cases that died.

1895.

Ages.	RECOVERIES. Ocular.	Palate.	Vagus.	General.	Ocular Palate and General.	Ocular and Palate.	Palate and General.	Palate, Vagus, and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	DEATHS. Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
FOUNTAIN HOSPITAL.																									
Under 1 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	7
1 to 2 ...	...	2	...	...	...	1	...	...	...	...	...	...	3	65 to 102	...	4	...	...	...	...	...	...	...	4	22 to 71
2 ,, 3 ...	...	2	...	...	...	...	...	...	...	...	...	...	2	52 and 159	...	...	...	...	...	...	...	3	...	3	8 ,, 44
3 ,, 4 ...	1	1	...	1	...	2	...	..	...	...	...	1	6	67 to 98	...	3	6	...	...	...	...	...	...	9	2 ,, 34
4 ,, 5 ...	1	7	...	...	...	1	...	...	...	...	...	...	9	35 ,, 101	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10 ...	2	20	3	1	...	1	...	...	...	...	1	...	28	34 ,, 165	1	2	5	...	...	...	...	2	...	10	2 to 36
10 ,, 15 ...	...	5	...	...	...	...	...	...	...	...	...	...	5	56 ,, 108	...	...	1	...	...	...	...	...	...	1	13
15 ,, 20 ...	...	2	...	...	...	...	...	...	...	...	...	...	2	42 and 61	...	1	...	...	...	...	...	...	...	1	32
20 and upwards ...	...	1	...	...	...	...	...	...	...	...	...	...	1	46	...	...	...	...	...	...	...	...	...	...	...
Total ...	4	40	3	2	...	5	...	...	...	...	1	1	56	...	1	11	12	...	...	...	...	5	...	29	
Percentage on total cases examined in which Diphtheria bacilli were found ...													19·5	...	...	...	...	...	...	...	...	...	...	10·1	
WESTERN HOSPITAL.																									
Under 1 ...	...	1	...	...	...	...	...	...	...	...	...	...	1	150	...	...	...	...	...	1	...	...	...	1	57
1 to 2 ...	...	2	...	1	...	...	...	...	...	...	...	...	3	55 to 116	...	...	...	2	...	...	...	...	...	2	7 and 28
2 ,, 3 ...	...	4	...	...	1	...	1	...	...	...	...	...	6	62 ,, 161	...	...	...	...	...	...	1	...	1	2	29 ,, 38
3 ,, 4 ...	...	6	...	2	...	...	...	...	...	...	1	1	10	53 ,, 132	...	4	6	...	...	...	...	...	...	10	2 to 36
4 ,, 5 ...	1	4	1	1	...	...	...	...	...	2	...	...	9	58 ,, 178	...	...	5	1	...	...	1	...	...	7	2 ,, 27
5 ,, 10 ...	1	13	...	3	...	2	5	...	...	...	...	1	25	28 ,, 124	...	3	8	1	...	...	2	...	...	14	2 ,, 41
10 ,, 15 ...	...	5	...	...	...	1	...	...	...	...	...	1	7	41 ,, 107	...	...	1	...	...	...	...	1	...	2	7 and 10
15 ,, 20 ...	...	2	...	...	...	...	...	...	...	...	...	...	2	56 and 61	...	...	...	...	...	...	...	...	...	...	...
20 and upwards ...	...	1	...	...	...	...	...	...	...	...	...	...	1	80	...	...	...	...	...	...	...	...	...	...	...
Total ...	2	38	1	7	1	3	6	...	...	2	1	3	64	...	...	7	20	4	...	1	4	1	1	38	
Percentage on total cases examined in which Diphtheria bacilli were found ...													15·5	...	...	...	...	...	...	...	...	...	...	9·2	
EASTERN HOSPITAL.																									
Under 1 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2 ...	...	...	...	...	...	...	...	...	...	1	...	...	1	53	...	4	...	...	...	...	...	...	...	4	3 to 26
2 ,, 3 ...	...	...	...	...	...	1	...	...	...	...	...	1	2	102 and 118	1	1	...	...	...	1	...	...	...	3	6 ,, 77
3 ,, 4 ...	...	6	...	1	...	1	...	...	...	...	...	...	8	48 to 107	...	3	...	...	...	...	...	1	...	4	15 ,, 35
4 ,, 5 ...	...	3	...	...	...	...	...	...	...	...	...	2	5	53 ,, 124	...	5	...	...	...	...	...	1	...	6	7 ,, 18
5 ,, 10 ...	3	14	...	...	...	...	...	...	...	1	2	3	23	44 ,, 165	...	9	...	...	...	1	1	...	1	12	4 ,, 76
10 ,, 15 ...	1	6	...	...	...	1	...	...	...	...	1	1	10	28 ,, 106	1	...	...	...	...	...	...	...	...	1	13
15 ,, 20 ...	...	2	1	...	...	...	...	...	...	...	...	...	3	55 ,, 119	...	...	...	...	...	...	...	...	...	...	...
20 and upwards ...	...	1	1	...	...	...	...	...	...	...	...	...	2	35 and 45	...	...	...	...	...	...	...	...	...	...	...
Total ...	4	32	2	1	...	3	...	...	...	2	3	7	54	...	2	22	...	...	...	2	1	2	1	30	
Percentage on total cases examined in which Diphtheria bacilli were found ...													17·8	...	...	...	...	...	...	...	...	...	...	9·9	
SOUTH-EASTERN HOSPITAL.																									
Under 1 ...	1	1	...	...	...	...	...	...	...	...	...	...	2	42 and 63	...	...	1	...	...	...	...	...	...	1	33
1 to 2 ...	1	1	...	1	1	...	...	...	...	...	...	...	4	62 to 122	...	2	...	...	...	...	...	2	1	5	6 to 36
2 ,, 3 ...	4	1	...	1	...	4	...	...	...	...	...	1	11	55 ,, 133	...	3	...	...	...	2	...	...	...	5	4 ,, 34
3 ,, 4 ...	4	8	...	...	...	7	1	...	1	1	...	...	22	51 ,, 161	...	5	1	...	...	...	...	...	...	6	5 ,, 51
4 ,, 5 ...	6	6	...	...	1	4	...	...	...	...	...	...	17	41 ,, 137	2	4	1	...	1	...	...	...	...	8	2 ,, 39
5 ,, 10 ...	9	27	...	...	5	13	...	...	...	2	2	...	58	40 ,, 222	...	8	1	...	...	1	2	5	...	17	2 ,, 31
10 ,, 15 ...	2	7	...	...	1	3	...	...	...	...	...	1	14	49 ,, 111	...	...	2	...	...	...	...	1	...	3	6 ,, 9
15 ,, 20 ...	...	2	...	...	...	...	...	...	...	...	...	...	2	77 and 88	...	...	...	...	...	...	...	...	...	...	...
20 and upwards ...	...	1	...	...	...	...	...	...	1	...	...	...	2	85 ,, 123	...	...	...	...	...	...	...	...	...	...	...
Total ...	27	54	...	2	8	31	1	...	2	3	2	2	132	...	2	22	6	...	1	3	2	8	1	45	
Percentage on total cases examined in which Diphtheria bacilli were found ...													31·4	...	...	...	...	...	...	...	...	...	...	10·7	

TABLE XVA. (*continued*).—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The days on which these Paralyses made their appearance are recorded as from initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1895.

Ages.	RECOVERIES.														DEATHS.										
	Ocular.	Palate.	Vagus.	General.	Ocular, Palate and General.	Ocular and Palate.	Palate and General.	Palate, Vagus, and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
SOUTH-WESTERN HOSPITAL.																									
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2...	...	2	...	...	...	...	...	...	...	...	...	...	2	39 and 49	...	2	1	...	...	...	...	...	...	3	7 to 31
2 ,, 3...	...	2	...	1	...	2	...	...	...	...	...	...	5	49 to 63	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4...	...	3	1	...	...	...	1	...	...	1	...	...	6	36 ,, 84	...	2	...	...	...	...	...	...	...	2	12 and 13
4 ,, 5...	...	5	...	...	...	1	...	...	...	...	...	...	6	14 ,, 85	...	2	3	...	1	...	1	1	...	8	8 to 42
5 ,, 10...	1	25	...	2	1	6	2	...	...	...	1	...	38	32 ,, 119	...	1	8	...	...	...	...	2	...	11	2 ,, 29
10 ,, 15...	...	4	...	1	1	...	2	...	...	...	2	...	10	5 ,, 112	...	2	1	...	...	...	...	3	...	6	8 ,, 84
15 ,, 20...	...	1	...	...	...	...	1	...	...	...	1	...	3	34 ,, 152	...	1	...	...	...	...	...	...	...	1	14
20 and upwards	...	1	1	1	...	...	...	...	...	...	...	...	3	8 ,, 39	...	...	1	...	...	...	...	...	...	1	8
Total	1	43	2	5	2	9	6	...	...	1	4	...	73	...	...	10	14	...	1	...	1	6	...	32	
Percentage on total cases examined in which Diphtheria bacilli were found ...													24·09	... ...	...	...	...	...	...	...	...	...	...	10·5	
NORTH-WESTERN HOSPITAL.																									
Under 1...	...	1	...	...	...	...	...	...	...	...	...	...	1	43	...	...	...	...	...	...	...	...	...	...	...
1 to 2...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	1	...	3	1 to 47
2 ,, 3...	...	5	...	...	...	1	...	...	...	...	...	...	6	44 to 108	...	1	1	...	...	...	...	...	...	2	32 and 46
3 ,, 4...	...	3	...	1	...	1	2	...	...	...	...	...	7	73 ,, 158	...	2	...	...	...	...	1	...	...	3	6 to 36
4 ,, 5...	...	6	...	...	...	1	1	...	...	...	...	...	8	24 ,, 116	...	...	...	1	...	...	...	2	...	3	4 ,, 13
5 ,, 10...	4	11	...	1	...	1	4	1	...	...	...	...	22	43 ,, 114	...	4	1	...	...	1	...	...	...	6	4 ,, 92
10 ,, 15...	...	5	...	...	...	...	1	...	...	...	...	...	6	35 ,, 89	...	...	...	...	...	...	...	1	...	1	10
15 ,, 20...	...	1	...	...	...	...	...	...	...	...	...	...	1	42	...	1	...	...	...	...	...	...	...	1	2
20 and upwards	...	2	...	...	...	...	...	...	...	...	...	...	2	69 and 97	...	...	...	...	...	...	...	...	...	...	...
Total	4	34	...	2	...	4	8	1	...	...	...	...	53	...	...	9	2	1	...	1	2	4	...	19	
Percentage on total cases examined in which Diphtheria bacilli were found ...													19·2	... ...	...	...	...	...	...	...	...	...	...	6·9	
NORTHERN HOSPITAL.																									
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10...	...	3	...	...	...	...	...	...	...	...	...	1	4	77 to 94	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15...	...	3	...	...	...	...	...	...	...	...	...	...	3	89 ,, 145	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	6	...	...	...	...	...	...	...	...	...	1	7	...	...	...	...	...	...	...	...	...	...	...	
Percentage on total cases examined in which Diphtheria bacilli were found ...													10·1	... ...	...	...	...	...	...	...	...	...	...	0·0	

TABLE XVA. (*continued*).—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The days on which these Paralyses made their appearance are recorded as from initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1896.

	RECOVERIES.															DEATHS.											
Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Palate, Vagus, and General.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
FOUNTAIN HOSPITAL.																											
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	28
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	3	5	...	1	...	...	...	...	...	...	...	...	4	13	14 to 34	...	1	...	...	1	1	...	...	...	...	3	40 to 67
3 ,, 4	2	6	...	...	...	1	...	...	...	...	...	...	1	10	54 ,, 98	...	5	1	...	...	...	...	...	...	...	6	8 ,, 75
4 ,, 5	1	6	1	...	...	...	...	...	...	...	...	...	4	12	37 ,, 104	...	2	...	...	...	...	...	...	...	...	2	10 and 18
5 ,, 10	8	43	...	1	...	4	...	...	...	...	...	...	11	67	29 ,, 131	...	7	1	...	...	...	...	1	...	1	10	7 to 29
10 ,, 15	3	11	...	1	...	2	...	...	...	...	...	...	1	18	29 ,, 113	...	1	...	...	...	...	...	...	...	...	1	11
15 ,, 20	...	...	...	...	...	1	...	...	...	...	...	...	...	1	69	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	1	3	...	...	...	...	...	...	...	...	...	...	...	4	40 to 160	...	...	...	...	...	...	...	...	...	...	...	...
Total... ...	18	74	1	3	...	8	...	...	...	...	...	...	21	125	...	...	17	2	...	1	1	...	1	...	1	23	
Percentage on total cases examined in which Diphtheria bacilli were found														19·5	...	...	...	...	...	...	...	...	...	...	...	3·6	
WESTERN HOSPITAL.																											
Under 1	...	2	...	...	...	...	...	...	...	...	...	...	...	2	27 and 50	...	2	...	...	...	...	...	...	1	...	3	3 to 21
1 to 2	...	1	1	...	...	1	...	...	...	...	...	...	...	3	13 to 122	...	...	...	1	...	...	...	...	...	...	1	22
2 ,, 3	1	4	...	2	...	...	1	...	...	...	...	...	1	9	30 ,, 125	...	3	2	...	...	...	...	1	...	...	6	2 to 35
3 ,, 4	1	7	...	1	...	1	...	...	...	...	1	...	...	11	44 ,, 118	...	3	3	2	...	...	...	...	...	...	8	6 ,, 23
4 ,, 5	1	11	1	...	...	1	1	...	...	...	...	...	4	19	39 ,, 123	...	5	3	...	...	1	...	2	...	...	11	3 ,, 30
5 ,, 10	...	34	10	3	1	1	3	...	...	1	1	...	4	58	34 ,, 238	...	4	1	...	...	1	1	2	1	...	10	2 ,, 38
10 ,, 15	...	5	1	...	...	...	...	...	...	...	...	...	...	6	55 ,, 128	...	2	...	1	...	...	...	2	...	...	5	8 ,, 12
15 ,, 20	...	3	...	...	...	...	...	...	...	...	...	...	...	3	32 ,, 129	...	...	...	...	...	...	...	1	...	...	1	5
20 and upwards	1	3	...	1	...	1	...	...	...	...	...	...	1	7	36 ,, 103	...	...	...	...	...	...	...	...	...	...	...	...
Total... ...	4	70	13	7	1	5	5	...	...	1	2	...	10	118	...	...	19	9	4	...	2	1	8	2	...	45	
Percentage on total cases examined in which Diphtheria bacilli were found														19·2	...	...	...	...	...	...	...	...	...	...	...	7·3	
EASTERN HOSPITAL.																											
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	2	2 and 5
1 to 2	3	2	...	...	...	...	...	...	...	...	...	...	2	7	39 and 89	...	...	...	...	1	...	...	1	...	...	2	7 ,, 19
2 ,, 3	1	5	...	...	...	...	...	...	1	1	...	...	3	11	25 to 103	...	4	1	...	1	...	...	1	...	...	7	7 to 49
3 ,, 4	2	9	...	2	...	3	1	...	...	...	...	...	3	20	52 ,, 130	...	4	1	1	...	...	...	...	...	...	6	2 ,, 44
4 ,, 5	...	9	...	1	...	3	...	...	...	...	...	...	7	20	46 ,, 152	...	5	1	...	1	...	...	...	...	2	9	3 ,, 37
5 ,, 10	3	34	...	2	...	7	4	...	...	1	...	...	18	69	21 ,, 154	...	8	1	...	...	2	...	2	...	1	14	2 ,, 82
10 ,, 15	...	15	...	...	...	1	...	...	...	...	...	...	6	22	41 ,, 44	...	3	...	...	...	...	...	...	...	...	3	13 ,, 48
15 ,, 20	...	2	...	...	...	1	...	...	...	...	...	...	...	3	53 ,, 60	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total... ...	9	76	...	5	...	15	5	...	1	2	...	...	39	152	...	...	24	6	1	3	2	...	4	...	3	43	
Percentage on total cases examined in which Diphtheria bacilli were found														30·9	...	...	...	...	...	...	...	...	...	...	...	8·7	
SOUTH-EASTERN HOSPITAL.																											
Under 1	2	1	...	...	...	2	...	...	...	...	...	...	...	5	50 to 102	...	1	1	...	...	...	...	...	...	...	2	4 and 18
1 to 2	3	5	...	...	...	...	...	...	...	...	...	...	1	9	55 ,, 176	1	7	...	...	...	...	...	...	...	...	8	44 to 88
2 ,, 3	5	4	...	...	...	11	1	...	...	...	...	...	2	23	52 and 189	1	7	...	...	2	...	...	...	...	...	10	4 ,, 47
3 ,, 4	13	4	...	...	...	14	...	...	...	...	...	...	...	31	41 to 182	...	9	...	...	1	...	...	2	...	...	12	1 ,, 69
4 ,, 5	13	14	...	...	1	16	...	...	1	...	...	...	...	45	46 ,, 161	1	3	...	...	1	...	...	...	...	...	5	2 ,, 41
5 ,, 10	24	34	...	...	1	30	...	1	...	2	...	...	2	94	30 and 217	...	13	5	...	...	...	1	...	...	...	19	2 ,, 101
10 ,, 15	3	7	1	...	...	5	...	...	...	2	...	...	...	18	44 to 160	...	3	...	...	1	...	...	...	1	...	5	2 ,, 17
15 ,, 20	...	1	...	...	...	...	...	...	...	...	...	...	...	1	109	...	1	...	...	...	...	...	...	1	...	2	11 and 12
20 and upwards	1	2	...	...	...	2	...	...	...	...	...	...	...	5	43 to 171	...	...	1	...	...	...	...	...	...	...	1	2
Total... ...	64	72	1	...	2	80	1	1	1	4	...	...	5	231	...	3	44	7	...	5	...	1	2	2	...	64	
Percentage on total cases examined in which Diphtheria bacilli were found														45·3	...	...	...	...	...	...	...	...	...	...	...	12·5	

Table XVa. (*continued*).—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The days on which these Paralyses made their appearance are recorded as from initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deal with cases that recovered; the second with cases that died.

1896

SOUTH-WESTERN HOSPITAL.

Ages.	RECOVERIES.															DEATHS.											
	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Palate, Vagus, and General.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	1	...	...	...	...	...	...	...	...	...	...	...	1	28	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	1	...	...	...	2	...	...	...	...	...	...	1	4	73 to 165	...	...	1	...	...	...	...	...	...	...	1	9
3 ,, 4	2	1	...	...	...	3	...	...	...	...	...	...	...	6	53 ,, 140	...	...	...	...	1	...	...	...	...	...	1	49
4 ,, 5	...	4	...	...	...	...	1	...	...	...	...	...	...	5	32 ,, 88	...	...	2	...	...	...	...	...	...	...	2	2 and 8
5 ,, 10	4	28	...	...	...	9	...	1	...	1	...	1	...	44	31 ,, 322	1	5	4	...	...	...	1	...	...	...	11	3 to 44
10 ,, 15	1	7	...	...	...	3	1	...	...	...	...	...	...	12	16 ,, 183	...	1	1	...	...	...	...	2	...	...	4	7 ,, 41
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	8
20 and upwards	2	...	...	...	...	...	...	...	...	...	...	...	...	2	31 and 32	...	...	...	...	...	...	...	...	...	...	...	...
Total	9	42	...	...	...	17	2	1	...	1	...	1	1	74	...	2	6	8	...	1	...	1	2	...	...	20	
Percentage on total cases examined in which Diphtheria bacilli were found														23·7	...	...	...	...	...	...	...	...	...	...	...	6·4	

NORTH-WESTERN HOSPITAL.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Palate, Vagus, and General.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	2	...	...	...	...	...	...	...	...	...	...	2	4	25 to 77	...	2	1	...	...	...	...	...	...	...	3	2 to 66
2 ,, 3	...	1	1	...	...	...	...	...	...	...	...	...	3	5	58 ,, 99	...	...	3	...	...	...	...	1	...	...	4	2 ,, 10
3 ,, 4	1	7	...	...	...	1	...	...	...	...	...	...	4	13	53 ,, 100	...	...	5	...	...	...	...	...	...	2	7	3 ,, 38
4 ,, 5	...	3	...	...	...	...	...	...	...	...	...	...	3	6	38 ,, 98	...	3	4	...	...	3	...	3	...	...	13	2 ,, 44
5 ,, 10	...	13	2	...	...	4	...	...	...	...	...	...	10	29	17 ,, 118	...	12	10	...	...	...	1	3	...	1	27	2 ,, 61
10 ,, 15	...	2	...	...	...	1	...	...	...	...	...	...	1	4	23 ,, 101	...	...	1	...	...	...	...	...	...	...	1	43
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	28	3	...	...	6	...	...	...	...	...	...	23	61	...	...	17	24	...	...	3	1	7	...	3	55	
Percentage on total cases examined in which Diphtheria bacilli were found														17·2	...	...	...	...	...	...	...	...	...	...	...	15·5	

NORTH-EASTERN HOSPITAL.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Palate, Vagus, and General.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	11
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	
Percentage on total cases examined in which Diphtheria bacilli were found														0·0	...	...	...	...	...	...	...	...	...	...	...	5·5	

TABLE XVA. (*continued*).—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found, and which were injected with Antitoxic Serum. The days on which these Paralyses made their appearance are recorded as from initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deal with cases that recovered; the second with cases that died.

1896.

BROOK HOSPITAL.

RECOVERIES.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Palate, Vagus, and General.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	1	1	...	...	...	...	...	...	...	...	...	...	4	6	45 to 116
3 ,, 4	...	1	...	...	...	...	...	...	...	...	...	...	5	6	32 ,, 130
4 ,, 5	1	4	...	...	...	1	...	...	...	...	...	...	4	10	45 ,, 109
5 ,, 10	...	8	1	...	...	2	...	...	...	3	...	...	7	21	48 ,, 159
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	3	3	58 ,, 113
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	1	1	52
20 and upwards	...	2	...	...	...	...	...	...	...	...	...	...	...	2	69 and 87
Total	2	16	1	...	...	3	...	...	...	3	...	...	24	49	...
Percentage on total cases examined in which Diphtheria bacilli were found														28·6	

DEATHS.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	1	...	...	...	...	...	...	...	1	5
1 to 2	...	...	...	...	...	...	...	1	1	...	2	4 and 48
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	2	...	...	...	...	...	...	...	2	7 ,, 19
4 ,, 5	...	2	4	...	...	...	...	...	...	...	6	3 to 43
5 ,, 10	...	2	2	...	1	...	1	2	...	2	10	4 ,, 44
10 ,, 15	...	...	1	...	...	...	...	...	...	...	1	9
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	..
Total	...	4	10	...	1	...	1	3	1	2	22	
Percentage	...	...	...	...	...	...	...	...	...	...	12·8	

NORTHERN HOSPITAL.

RECOVERIES.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Palate, Vagus, and General.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	5	...	...	...	...	...	...	...	...	...	...	...	5	75 to 105
10 ,, 15	...	3	...	...	...	...	...	...	...	...	...	...	...	3	70 ,, 84
15 ,, 20	...	1	...	...	...	...	...	...	...	...	...	...	...	1	122
20 and upwards	...	1	...	...	...	...	...	...	...	...	...	...	...	1	96
Total	...	10	...	...	...	...	...	...	...	...	...	...	...	10	...
Percentage on total cases examined in which Diphtheria bacilli were found														5.5	

DEATHS.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	..
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	.
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	.
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	..
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...	...	
Percentage	...	...	...	...	...	...	...	...	...	...	0·0	

GORE FARM HOSPITAL.

RECOVERIES.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Palate, Vagus, and General.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	1	...	...	...	...	...	...	...	...	...	1	101
5 ,, 10	...	1	...	...	...	...	...	...	...	...	...	...	...	1	79
10 ,, 15	...	1	...	...	...	...	...	...	...	...	...	...	...	1	95
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	2	...	1	...	...	...	...	...	...	...	...	...	3	
Percentage on total cases examined in which Diphtheria bacilli were found														5·2	

DEATHS.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...	...	
Percentage	...	...	...	...	...	...	...	...	...	...	0·0	

TABLE XVIA.—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected. The days on which these Paralyses made their appearance are recorded as from initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1895.

Ages.	RECOVERIES. Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	DEATHS. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Palate and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
FOUNTAIN HOSPITAL.																				
Under 1	1	1	...	...	...	...	...	...	...	2	58 and 71	...	...	...	...	...	...	...	...	...
1 to 2	...	1	...	...	...	...	...	...	...	1	93	...	...	1	...	...	...	...	1	7
2 ,, 3	...	1	...	...	...	...	...	...	...	1	52	...	1	...	...	...	...	...	1	3
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	1	...	...	5	5 to 34
4 ,, 5	1	1	...	...	...	...	...	...	1	3	49 to 78	...	1	...	...	...	...	...	1	12
5 ,, 10	4	17	...	...	...	...	...	...	3	24	44 ,, 105	...	4	1	...	1	...	...	6	6 to 57
10 ,, 15	1	9	...	...	...	...	...	...	1	11	48 ,, 111	...	...	...	...	...	...	...	...	...
15 ,, 20	1	4	...	...	...	...	...	...	1	6	45 ,, 122	...	...	...	...	...	...	...	...	...
20 and upwards...	...	2	...	...	...	...	...	...	...	2	19 and 48	...	1	...	...	...	...	...	1	22
Total	8	36	...	...	...	...	...	...	6	50	...	...	9	4	...	2	...	...	15	
Percentage on total cases examined in which Diphtheria bacilli were found										12·5	...	...	...	...	...	...	...	...	3·7	
WESTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	2
2 ,, 3	...	1	...	...	...	...	...	...	...	1	121	...	1	...	...	...	...	...	1	5
3 ,, 4	...	...	...	...	...	1	...	...	...	1	135	...	...	...	...	...	...	...	...	...
4 ,, 5	...	1	...	...	...	...	2	...	...	3	58 to 86	...	...	...	...	...	...	...	...	...
5 ,, 10	...	5	...	1	...	...	3	...	...	9	58 ,, 114	...	...	...	1	...	...	...	1	7
10 ,, 15	...	2	...	...	...	...	...	...	...	2	41 and 64	...	...	1	...	...	...	...	1	10
15 ,, 20	1	...	...	...	...	...	...	...	...	1	37	...	...	...	...	...	...	...	...	...
20 and upwards...	1	1	...	...	...	...	...	...	...	2	51 and 82	...	...	...	...	...	...	...	...	...
Total	2	10	...	1	...	1	5	...	..	19	...	...	1	2	1	...	...	...	4	
Percentage on total cases examined in which Diphtheria bacilli were found										10·05	...	...	...	...	...	...	...	...	2·1	
EASTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	2	...	...	...	...	...	...	...	2	64 and 109	...	1	1	...	...	1	...	3	2 to 34
3 ,, 4	...	4	...	...	...	...	...	...	...	4	39 ,, 205	...	2	...	...	...	...	...	2	6 and 8
4 ,, 5	1	4	...	...	...	...	1	...	...	6	27 ,, 112	...	3	...	...	1	...	...	4	3 to 39
5 ,, 10	...	9	1	1	...	1	...	1	4	17	53 ,, 224	...	2	2	1	1	..	...	6	3 ,, 43
10 ,, 15	...	10	1	1	...	...	...	4	1	17	42 ,, 133	...	...	...	1	...	...	2	3	27 ,, 53
15 ,, 20	...	3	1	...	...	...	...	1	...	5	29 ,, 61	...	...	...	...	...	...	...	...	...
20 and upwards...	...	1	1	...	...	...	1	...	...	3	58 ,, 69	...	...	...	...	...	...	...	...	...
Total	1	33	4	2	...	1	2	6	5	54	...	...	8	3	2	2	1	2	18	
Percentage on total cases examined in which Diphtheria bacilli were found										13·3	...	...	...	...	...	...	...	...	4·4	
SOUTH-EASTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	1	...	...	...	1	161	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	1	...	...	...	...	...	...	1	74	...	...	1	...	...	...	...	1	23
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	26
4 ,, 5	1	...	...	...	...	1	...	...	...	2	57 and 160	...	...	...	...	...	...	...	...	..
5 ,, 10	...	2	...	...	1	3	...	...	...	6	58 to 168	...	1	...	...	...	...	...	1	2
10 ,, 15	1	4	...	...	...	...	...	...	...	5	55 ,, 123	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
Total	2	6	1	...	1	5	...	...	...	15	...	...	2	1	...	...	...	...	3	
Percentage on total cases examined in which Diphtheria bacilli were found										15·9	...	...	...	...	...	...	...	...	3·1	

TABLE XVIA. (*continued*).—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The days on which these Paralyses made their appearance are recorded as from initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases recovered; that the second with cases that died.

1895.

Ages.	RECOVERIES. Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	DEATHS. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Palate and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
SOUTH-WESTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	1	...	...	...	...	...	...	...	1	24	...	...	...	...	...	...	...	...	...
3 ,, 4	...	1	...	...	...	...	...	...	...	1	33	1	1	...	...	...	...	...	2	5 and 43
4 ,, 5	...	2	...	...	...	...	...	...	...	2	48 and 63	...	...	...	...	...	...	...	...	...
5 ,, 10	...	4	...	...	...	1	...	...	...	5	28 to 50	...	2	...	...	...	...	1	3	5 to 84
10 ,, 15	...	1	...	2	...	1	...	...	...	4	34 ,, 45	...	1	...	...	...	...	...	1	12
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	1	...	2	...	...	...	...	...	3	27 to 32	...	...	...	...	...	...	...	...	...
Total	...	10	...	4	...	2	...	...	...	16	...	1	4	...	...	...	...	1	6	
Percentage on total cases examined in which Diphtheria bacilli were found...										11·3	...	...	...	...	...	...	...	...	4·2	
NORTH-WESTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	34
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	2	22 and 44
3 ,, 4	...	3	...	...	...	...	...	...	...	3	65 to 105	...	2	...	...	...	1	...	3	7 to 61
4 ,, 5	1	2	...	...	...	...	...	...	...	3	43 ,, 110	...	1	1	...	...	...	...	2	2 and 4
5 ,, 10	3	18	1	1	...	4	3	...	1	31	38 ,, 104	...	5	3	1	...	...	...	9	1 to 39
10 ,, 15	...	2	...	...	...	...	1	...	...	3	58 ,, 97	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	1	...	...	...	...	...	1	...	2	69 and 97	...	...	...	...	...	...	...	...	...
Total	4	26	1	1	...	4	4	1	1	42	...	...	10	4	2	...	1	...	17	
Percentage on total cases examined in which Diphtheria bacilli were found...										12·1	...	...	...	...	...	...	...	...	4·9	
NORTH-EASTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	1	...	...	...	...	...	...	...	1	126	...	1	...	...	...	...	...	1	42
5 ,, 10	1	...	...	...	...	...	...	...	...	1	68	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	1	...	...	...	...	...	...	...	2	...	...	1	...	...	...	...	...	1	
Percentage on total cases examined in which Diphtheria bacilli were found...										3·4	...	...	...	...	...	...	...	...	1·7	
NORTHERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	2	...	...	...	...	...	...	...	2	74 and 147	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	2	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	
Percentage on total cases examined in which Diphtheria bacilli were found...										1·6	...	...	...	...	...	...	...	...	0·0	

TABLE XVIA. (*continued*).—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The days on which these Paralyses made their appearance are recorded as from the initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1896.

Ages.	RECOVERIES.												DEATHS.								
	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
FOUNTAIN HOSPITAL.																					
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	4
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	1	1	...	...	1	...	...	...	...	...	3	71 to 140	...	2	...	...	...	...	...	2	17 and 45
4 ,, 5	...	1	...	1	...	...	...	...	...	1	3	52 ,, 92	...	...	...	...	...	1	...	1	22
5 ,, 10	...	10	...	...	2	...	...	...	...	1	13	45 ,, 203	...	...	...	...	...	1	...	1	7
10 ,, 15	...	...	...	...	...	...	...	...	...	4	4	51 ,, 76	...	...	...	...	...	...	...	...	...
15 ,, 20	...	2	...	...	...	...	...	...	...	...	2	30 and 45	...	...	...	...	...	...	...	...	...
20 and upwards...	...	1	...	...	...	...	...	...	...	...	1	70	...	...	...	...	...	...	...	...	...
Total	1	15	...	1	3	...	...	...	...	6	26	...	...	3	...	...	...	2	...	5	
Percentage on total cases in which Diphtheria bacilli were found											8·4	... ...	...	...	...	...	...	...	...	1·6	
WESTERN HOSPITAL.																					
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	1	1	...	...	...	...	...	...	...	2	4	38 to 80	...	...	1	...	...	...	...	1	2
3 ,, 4	...	...	...	...	...	...	...	...	...	1	1	102	...	1	...	...	...	...	...	1	12
4 ,, 5	...	1	2	...	...	...	...	...	...	...	3	52 to 106	...	...	...	...	...	1	...	1	8
5 ,, 10	1	4	1	...	...	...	...	...	1	4	11	34 ,, 183	...	...	...	...	...	...	...	...	...
10 ,, 15	...	6	...	...	...	...	...	...	1	...	7	35 ,, 104	...	...	1	...	...	1	...	2	6 and 11
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	2	...	...	...	...	...	...	...	...	2	35 and 72	...	...	...	...	...	...	...	...	...
Total	2	14	3	...	...	...	...	...	2	7	28	...	...	1	2	...	...	2	...	5	
Percentage on total cases in which Diphtheria bacilli were found											10·3	... ...	...	...	...	...	...	...	...	1·8	
EASTERN HOSPITAL.																					
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2	2 and 58
2 ,, 3	1	1	...	...	...	...	1	...	...	...	3	50 to 179	...	...	...	...	...	...	...	...	...
3 ,, 4	1	...	...	...	...	...	...	...	...	...	1	58	...	1	1	...	...	...	...	2	6 and 17
4 ,, 5	...	3	...	...	...	...	...	...	...	...	3	55 to 110	...	1	...	...	...	...	...	1	17
5 ,, 10	3	7	...	...	1	...	...	...	...	7	18	24 ,, 96	...	...	...	...	...	...	...	...	...
10 ,, 15	2	2	...	1	...	...	...	...	...	3	8	31 ,, 114	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	4	...	...	...	1	...	...	...	...	5	26 to 70	...	...	...	...	...	...	...	...	...
Total	7	17	...	1	1	1	1	...	...	10	38	...	...	2	1	...	2	...	...	5	
Percentage on total cases in which Diphtheria bacilli were found											16·2	... ...	...	...	...	...	...	...	...	2·1	

TABLE XVIA. (*continued*).—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The days on which these Paralyses made their appearance are recorded as from the initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1896.

Ages.	RECOVERIES. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	DEATHS. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
SOUTH-EASTERN HOSPITAL.																					
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	64
1 to 2	...	1	...	...	1	...	...	...	...	...	2	136 and 154	...	...	...	...	1	...	...	1	11
2 ,, 3	2	1	...	...	...	...	...	...	...	...	3	54 to 81	...	1	...	...	...	...	...	1	21
3 ,, 4	1	1	...	...	...	...	...	...	...	...	2	72 and 125	...	...	...	...	...	...	...	...	...
4 ,, 5	2	2	1	...	2	...	...	...	...	...	7	15 to 158	...	1	...	...	...	1	...	2	3 and 7
5 ,, 10	11	5	...	...	4	...	...	...	...	...	20	33 ,, 120	...	...	1	...	...	...	1	2	46 ,, 50
10 ,, 15	4	2	...	1	...	...	...	...	...	...	7	44 ,, 97	...	...	...	...	...	...	...	...	...
15 ,, 20	1	1	...	...	1	...	...	...	...	...	3	34 ,, 62	...	...	...	...	...	...	...	...	...
20 and upwards	...	4	1	...	1	...	...	...	...	...	6	38 ,, 139	...	...	...	...	...	...	...	...	...
Total	21	17	2	1	9	...	...	...	...	...	50	...	...	3	1	...	1	1	1	7	
Percentage on total cases in which Diphtheria bacilli were found											26·1									3·6	
SOUTH-WESTERN HOSPITAL.																					
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	1
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	1	...	...	...	...	...	...	...	...	...	1	120	...	...	...	...	...	...	...	...	...
5 ,, 10	...	8	1	...	...	...	...	...	...	...	9	35 to 108	...	...	...	...	...	1	...	1	6
10 ,, 15	...	2	...	...	...	...	...	...	...	...	2	28 and 36	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	1	...	...	...	...	...	...	...	...	1	49	...	...	...	...	...	...	...	...	...
Total	1	11	1	...	...	...	...	...	...	...	13	...	...	...	1	...	...	1	...	2	
Percentage on total cases in which Diphtheria bacilli were found											7·6									1·1	
NORTH-WESTERN HOSPITAL.																					
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	24
2 ,, 3	1	3	...	...	...	...	...	...	...	...	4	68 to 76	...	3	1	...	...	...	...	4	2 to 17
3 ,, 4	...	1	...	...	1	...	...	...	...	...	2	54 and 93	...	2	...	...	...	...	...	2	17 and 18
4 ,, 5	...	4	...	...	1	...	...	...	...	...	5	76 to 129	...	3	1	...	...	...	...	4	3 to 34
5 ,, 10	3	13	3	1	3	...	1	...	1	6	31	54 ,, 151	1	4	2	...	1	5	...	13	2 ,, 59
10 ,, 15	...	2	1	...	...	...	1	...	...	1	5	48 ,, 121	...	...	...	...	...	...	...	...	...
15 ,, 20	...	2	...	1	...	...	...	...	...	1	4	43 ,, 67	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	4	25	4	2	5	...	2	...	1	8	51	...	2	12	4	...	1	5	...	24	
Percentage on total cases in which Diphtheria bacilli were found											13·5									6·3	

TABLE XVIA. *(continued)*.—Nature and number of Paralyses found, at different ages, in cases in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The days on which these Paralyses made their appearance are recorded as from the initial symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1896.

NORTH-EASTERN HOSPITAL.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 „ 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 „ 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 „ 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	8
10 „ 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 „ 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	
Percentage on total cases examined in which Diphtheria bacilli were found											0·0									3·4	

BROOK HOSPITAL.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	1	...	...	...	...	...	...	...	...	...	1	39	...	...	...	...	...	...	...	...	...
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 „ 4	...	1	...	...	...	...	...	...	...	...	1	63	...	...	...	...	...	...	...	...	...
4 „ 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 „ 10	...	1	...	...	...	...	...	...	...	3	4	46 to 86	...	...	...	...	...	...	...	...	...
10 „ 15	...	...	1	...	...	...	...	...	...	...	1	24	...	...	...	...	...	...	...	...	...
15 „ 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	1	1	49	...	...	...	...	...	...	...	...	...
Total	1	2	1	...	...	...	...	...	...	4	8	...	...	...	...	...	...	...	...		
Percentage on total cases examined in which Diphtheria bacilli were found											15·09									0·0	

NORTHERN HOSPITAL.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular, Palate, and Vagus.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 „ 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 „ 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 „ 10	...	3	...	...	...	...	...	...	...	...	3	45 to 93	...	...	...	...	...	...	...	...	...
10 „ 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 „ 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	3	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	
Percentage on total cases examined in which Diphtheria bacilli were found											4·1									0·0	

TABLE XVIIA.—Nature and number of Paralyses, at different ages, found in cases in which no Diphtheria bacilli were found, but which were injected with Antitoxic Serum. The days on which these Paralyses made their appearance are recorded as from initial (?) symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1895.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	Ocular and Palate.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
FOUNTAIN HOSPITAL.														
Under 1	...	...	...	...	...	...	...	...	1	...	...	...	1	5
1 to 2...	...	...	...	...	...	...	...	...	1	...	...	...	1	35
2 ,, 3...	...	1	...	...	...	1	70	...	...	...	1	...	1	38
3 ,, 4...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10...	...	1	...	...	...	1	15	...	...	...	...	...	...	...
10 ,, 15...	2	...	...	...	...	2	66 and 97	...	...	...	...	...	...	...
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	2	2	...	...	...	4	...	...	2	...	1	...	3	
Percentage on total cases examined in which no Diphtheria bacilli were found						14·8	... ...						11·1	
WESTERN HOSPITAL.														
Under 1...	...	1	...	...	...	1	72	...	...	...	...	...	...	...
1 to 2...	...	1	...	...	...	1	80	...	...	...	...	...	...	...
2 ,, 3...	...	...	...	1	...	1	95	...	...	...	...	...	...	...
3 ,, 4...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10...	...	2	...	...	...	2	22 and 31	...	...	...	...	...	...	...
10 ,, 15...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	1	1	25
Total	...	4	...	1	...	5	...	...	...	...	...	1	1	
Percentage on total cases examined in which no Diphtheria bacilli were found						6·8	... ...						1·3	
EASTERN HOSPITAL.														
Under 1...	...	...	...	...	...	...	...	1	...	...	...	...	1	16
1 to 2...	...	1	...	...	...	1	54	...	1	...	...	...	1	8
2 ,, 3...	...	...	...	1	...	1	94	...	...	...	...	...	...	...
3 ,, 4...	...	...	1	...	...	1	101	...	...	...	...	...	...	...
4 ,, 5...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	1	1	1	...	3	...	1	1	...	...	...	2	
Percentage on total cases examined in which no Diphtheria bacilli were found						4·9	... ...						3·2	
SOUTH-EASTERN HOSPITAL.														
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4...	1	1	...	...	...	2	35 and 53	...	...	...	...	...	...	...
4 ,, 5...	1	...	...	...	1	2	93 ,, 102	...	...	...	...	...	...	...
5 ,, 10...	3	1	...	...	2	6	28 to 93	...	...	...	...	...	...	...
10 ,, 15...	1	1	1	1	1	5	37 ,, 108	...	1	...	1	...	2	6 and 7
15 ,, 20...	...	1	...	...	...	1	72	...	...	...	...	...	...	...
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	6	4	1	1	4	16	...	...	1	...	1	...	2	
Percentage on total cases examined in which no Diphtheria bacilli were found						17·9	... ...						2·2	

TABLE XVIIA. (*continued*).—Nature and number of Paralyses, at different ages, found in cases in which no Diphtheria bacilli were found, but which were injected with Antitoxic Serum. The days on which these Paralyses made their appearance are recorded as from initial (?) symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1895.

SOUTH-WESTERN HOSPITAL.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	Ocular and Palate.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	1	...	...	...	...	1	34	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	1	...	...	...	1	5
5 ,, 10	...	...	...	...	...	...	...	...	1	1	...	...	2	5 to 10
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	...	...	...	...	1	...	...	2	1	...	...	3	
Percentage on total cases examined in which no Diphtheria bacilli were found						2·5	...	...	...	...	...	...	7·6	

NORTH-WESTERN HOSPITAL.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	Ocular and Palate.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	1	...	...	...	1	25	...	...	...	...	...	...	...
3 ,, 4	...	...	...	1	...	1	42	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	1	...	...	...	...	1	25	...	...	...	...	...	...	...
Total	1	1	...	1	...	3	...	...	...	...	...	...	...	
Percentage on total cases examined in which no Diphtheria bacilli were found						7·1	...	...	...	...	...	...	0·0	

NORTHERN HOSPITAL.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	Ocular and Palate.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	1	...	...	...	1	38	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	1	...	...	...	1	...	...	...	...	...	...	...	
Percentage on total cases examined in which no Diphtheria bacilli were found						25·0	...	...	...	...	...	...	0·0	

TABLE XVIIA. (*continued*).—Nature and number of Paralyses, at different ages, found in cases in which no Diphtheria bacilli were found, but which were injected with Antitoxic Serum. The days on which these Paralyses made their appearance are recorded as from initial (?) symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases recovered; the second with cases that died.

1896.

Ages.	RECOVERIES. Ocular.	Palate.	Vagus.	General	Ocular and Palate.	Palate and General.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	DEATHS. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Ocular and General.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
FOUNTAIN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	1	...	...	...	...	...	...	...	1	36	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	1	...	...	...	...	...	...	...	1	35	...	...	...	...	...	...	...	1	...	1	85
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	2	4 and 17
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	1	2	2	...	1	...	...	1	...	7	44 to 89	...	1	...	...	...	...	1	...	...	2	7 and 25
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	14
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	32
20 and upwards... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	4	2	...	1	...	...	1	...	9	...	...	5	...	...	..	...	1	1	...	7	
Percentage on total cases examined in which no Diphtheria bacilli were found ...										10·3	...										8·04	
WESTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	8
1 to 2	...	1	...	...	...	...	...	...	...	1	84	...	1	...	...	...	...	...	...	...	1	17
2 ,, 3	...	...	1	...	...	...	...	...	...	1	88	...	...	1	...	...	...	...	...	...	1	5
3 ,, 4	...	1	...	...	...	...	...	...	...	1	32	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	38
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards... ...	...	...	...	...	...	1	...	...	...	1	162	...	...	...	...	...	...	...	...	...	...	...
Total	...	2	1	...	...	1	...	...	...	4	...	...	2	1	...	...	...	...	...	1	4	
Percentage on total cases examined in which no Diphtheria bacilli were found ...										5·7	...										5·7	
EASTERN HOSPITAL.																						
Under 1	1	...	...	...	...	...	...	...	...	1	22	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	1	...	...	...	...	...	...	...	...	1	65	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	1	1	...	...	...	...	...	...	...	2	53 and 74	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	3	...	...	...	...	...	...	...	3	85 to 125	1	1	...	...	...	...	...	...	...	2	7 and 71
10 ,, 15	...	...	...	...	2	...	...	...	...	2	50 and 80	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	3	4	...	...	2	...	...	...	...	9	...	1	1	...	...	...	...	...	...	...	2	
Percentage on total cases examined in which no Diphtheria bacilli were found ...										16·3	...										3·6	
SOUTH-EASTERN HOSPITAL.																						
Under 1	...	1	...	...	...	...	...	...	...	1	62	1	...	...	...	1	...	...	...	...	2	3 and 48
1 to 2	1	1	...	...	1	...	...	...	...	3	35 to 107	...	2	...	...	...	...	...	...	...	2	3 ,, 13
2 ,, 3	3	...	...	...	...	...	...	...	...	3	70 ,, 162	...	3	...	...	...	...	...	...	...	3	4 to 14
3 ,, 4	2	1	...	...	...	...	...	...	...	3	91 ,, 121	...	1	1	1	...	...	...	...	...	3	12 ,, 18
4 ,, 5	2	4	...	...	1	...	...	...	...	7	48 ,, 100	1	...	...	...	...	...	...	...	...	1	5
5 ,, 10	2	...	...	...	1	...	...	...	...	3	48 ,, 230	...	1	...	...	...	...	...	...	...	1	11
10 ,, 15	1	1	...	...	1	1	...	...	...	4	56 ,, 117	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards... ...	...	2	...	...	1	...	...	...	...	3	22 to 55	..	...	...	...	...	...	...	...	...	...	...
Total	11	10	...	...	5	1	...	...	...	27	...	2	7	1	1	1	...	...	...	...	12	
Percentage on total cases examined in which no Diphtheria bacilli were found ...										32·1	...										14·2	

Table XVIIa. (*continued*).—Nature and number of Paralyses, at different ages, found in cases in which no Diphtheria bacilli were found, but which were injected with Antitoxic Serum. The days on which these Paralyses made their appearance are recorded as from initial (?) symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1896.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Palate and General.	Ocular and General.	Palate and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	General.	Ocular and Palate.	Ocular and General.	Palate and Vagus.	Ocular and Vagus.	Mixed.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
SOUTH-WESTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	7
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	1	...	...	...	...	...	...	...	1	78	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	5
Total	...	1	...	...	...	...	...	...	...	1	...	...	2	...	...	...	...	...	...	...	2	
Percentage on total cases examined in which no Diphtheria bacilli were found										5·2	...										10·5	
NORTH-WESTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	1	1	73	...	...	...	...	...	1	...	...	...	1	46
3 ,, 4	...	...	1	1	...	...	...	...	...	2	31 and 49	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	1	...	...	...	...	...	...	1	32	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	1	...	...	1	37	...	1	...	...	...	...	...	...	...	1	4
10 ,, 15	...	1	...	...	...	1	...	...	...	2	48 and 102	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	1	2	1	...	1	1	...	1	7	...	...	1	...	...	...	1	...	...	...	2	
Percentage on total cases examined in which no Diphtheria bacilli were found										16·6	...										4·7	
NORTH-EASTERN HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	14
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	
Percentage on total cases examined in which no Diphtheria bacilli were found										0·0	...										16·6	
BROOK HOSPITAL.																						
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	1	...	...	...	...	...	...	1	95	...	...	...	...	...	...	1	...	...	1	11
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	1	
Percentage on total cases examined in which no Diphtheria bacilli were found										5·8	...										5·8	

TABLE XVIIIA.—Nature and number of Paralyses, at different ages, found in cases in which <u>no Diphtheria bacilli</u> were found, and in which <u>no Antitoxic Serum</u> was injected. The days on which these Paralyses made their appearance are recorded as from initial (?) symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1895.

Ages	RECOVERIES.								DEATHS.				
	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Ocular.	Palate.	General.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
FOUNTAIN HOSPITAL.													
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	1	...	...	...	...	1	50	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	1	...	...	...	...	1	151	...	...	...	...	...
4 ,, 5	1	2	...	...	...	...	3	9 to 62	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	4	...	...	...	...	5	...	...	...	...	...	
Percentage on total cases examined in which no Diphtheria bacilli were found							2·3	... ...				0·0	
WESTERN HOSPITAL.													
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	1	...	...	...	...	1	7	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	1	1	2
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	1	...	...	...	...	1	14	...	1	...	1	8
Total	...	2	...	...	...	...	2	...	...	1	1	2	
Percentage on total cases examined in which no Diphtheria bacilli were found							1·2	... ...				1·2	
EASTERN HOSPITAL.													
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	1	...	1	13
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	1	...	1	3
10 ,, 15	...	...	1	...	...	...	1	45	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	1	...	...	...	...	1	76	...	...	...	...	...
Total	...	1	1	...	...	...	2	...	...	2	...	2	
Percentage on total cases examined in which no Diphtheria bacilli were found							0·7	... ...				0·7	
SOUTH-EASTERN HOSPITAL.													
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	1	1	2	128 and 157	...	1	...	1	11
4 ,, 5	1	...	...	...	...	1	2	78 ,, 108	...	1	...	1	9
5 ,, 10	...	3	...	1	2	1	7	48 to 157	...	1	...	1	2
10 ,, 15	1	1	...	...	...	1	3	29 ,, 93	...	...	...	...	...
15 ,, 20	...	1	...	...	...	...	1	68	...	...	...	...	...
20 and upwards...	...	2	...	...	...	...	2	52 and 83	...	...	...	...	...
Total	2	7	...	1	3	4	17	...	...	3	...	3	
Percentage on total cases examined in which no Diphtheria bacilli were found							12·9	... ...				2·2	

TABLE XVIIIA. (*continued*).—Nature and number of Paralyses, at different ages, found in cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected. The days on which these Paralyses made their appearance are recorded as from initial (?) symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1895.

SOUTH-WESTERN HOSPITAL.

Ages.	Recoveries.								Deaths.				
	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Ocular.	Palate.	General.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	..	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	1	...	...	...	...	1	60	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	2	...	...	...	...	2	25 and 28	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	1	...	...	...	...	1	50	...	1	...	1	5
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	4	...	...	...	...	4	...	...	1	...	1	
Percentage on total cases examined in which no Diphtheria bacilli were found							5·2	...	...	...	...	... 1·3	

NORTH-WESTERN HOSPITAL.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Total.	Lowest and Highest Day.	Ocular.	Palate.	General.	Total.	Lowest and Highest Day.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	1	...	...	1	9
4 ,, 5	...	...	...	1	...	...	1	48	1	...	...	1	44
5 ,, 10	...	1	...	...	...	...	1	82	...	1	...	1	6
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	1	1	4
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	..
Total	...	1	...	1	...	...	2	...	2	1	1	4	
Percentage on total cases examined in which no Diphtheria bacilli were found							1·5	...	...	...	...	... 3·05	

NORTHERN HOSPITAL.

Ages.	Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Total.	Lowest and Highest Day.	Ocular.	Palate.	General.	Total.	Lowest and Highest Day.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	2	...	...	...	...	2	22 and 36	...	...	...	...	...
5 ,, 10	...	3	...	...	...	...	3	36 to 213	...	...	...	...	...
10 ,, 15	...	1	...	...	...	...	1	42	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	6	...	...	...	...	6	...	...	...	...	...	
Percentage on total cases examined in which no Diphtheria bacilli were found							10·3	...	..	...	...	... 0·0	

TABLE XVIIIA. (continued).—Nature and number of Paralyses, at different ages, found in cases in which no Diphtheria bacilli were found, and in which

Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1896.

Ages.	Recoveries: Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular and General.	Palate and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths: Ocular.	Palate.	Vagus.	General.	Ocular and General.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
FOUNTAIN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	6
2 ,, 3	...	...	...	...	...	...	...	...	1	1	107	...	...	...	...	...	...	...	...	...
3 ,, 4	...	1	...	...	...	...	...	...	1	2	39 and 82	...	...	...	...	...	...	...	...	...
4 ,, 5	...	1	...	...	...	...	...	...	...	1	23	...	...	...	...	...	...	...	...	...
5 ,, 10	...	3	1	...	...	...	...	...	...	4	45 to 65	...	...	1	...	...	...	...	1	25
10 ,, 15	...	2	...	...	...	...	...	...	...	2	55 and 99	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	4	...	...	...	...	...	...	...	4	6 to 40	...	...	...	...	...	...	...	...	...
Total	...	11	1	...	...	...	...	...	2	14	...	1	...	1	...	...	...	...	2	
Percentage on total cases examined in which no Diphtheria bacilli were found									...	5·1	...	...	...	...	...	...	...	...	0·7	
WESTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	8
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	1	...	...	1	68	...	1	...	...	...	...	...	1	45
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	1	...	...	...	...	...	...	1	78	...	...	...	...	...	1	...	1	35
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	1	...	...	...	...	...	...	1	...	2	16 and 55	...	...	1	...	...	...	...	1	2
Total	1	...	1	...	...	...	1	1	...	4	...	...	1	1	...	...	1	1	4	
Percentage on total cases examined in which no Diphtheria bacilli were found									...	1·8	...	...	...	...	...	...	...	...	1·8	
EASTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	8
2 ,, 3	...	1	...	...	...	...	...	...	...	1	108	1	...	...	...	...	...	...	1	30
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	2	14 and 70
4 ,, 5	...	1	...	...	...	...	...	...	...	1	25	1	...	...	...	...	...	...	1	18
5 ,, 10	...	2	...	...	...	...	...	...	1	3	36 to 91	...	...	...	...	...	...	...	...	...
10 ,, 15	...	1	...	...	...	...	...	...	...	1	31	1	...	...	...	...	...	...	1	4
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	1	...	...	...	...	...	...	1	47	...	...	1	...	...	...	...	1	86
Total	...	5	1	...	...	...	...	...	1	7	...	4	2	1	...	...	...	...	7	
Percentage on total cases examined in which no Diphtheria bacilli were found									...	2·6	...	...	...	...	...	...	...	...	2·6	
SOUTH-EASTERN HOSPITAL.																				
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	2	15 and 17
2 ,, 3	2	2	...	1	...	...	...	...	...	5	53 to 162	...	...	...	...	...	...	...	...	...
3 ,, 4	2	3	...	1	...	...	...	...	...	6	42 ,, 180	...	1	...	...	...	...	...	1	25
4 ,, 5	1	...	...	...	...	...	...	...	...	1	84	...	...	...	...	...	...	...	...	...
5 ,, 10	3	2	...	...	...	1	...	...	...	6	25 to 120	1	...	...	...	...	...	...	1	7
10 ,, 15	3	1	...	...	...	...	...	...	...	4	28 ,, 92	...	...	...	...	...	...	...	...	...
15 ,, 20	...	1	...	...	...	...	...	...	...	1	51	...	...	...	...	...	...	...	...	...
20 and upwards	1	3	...	...	1	...	...	...	...	5	15 to 94	...	...	...	...	...	...	...	...	...
Total	12	12	...	2	1	1	...	...	...	28	...	1	3	...	..	...	...	...	4	
Percentage on total cases examined in which no Diphtheria bacilli were found									...	14·7	...	...	...	...	...	...	...	...	2·1	

TABLE XVIIIA. (*continued*).—Nature and number of Paralyses, at different ages, found in cases in which no Diphtheria bacilli were found, and in which no Antitoxic Serum was injected. The days on which these Paralyses made their appearance are recorded as from initial (?) symptoms of the disease noted by the Ambulance Nurse. The first series of figures deals with cases that recovered; the second with cases that died.

1896.

SOUTH-WESTERN HOSPITAL.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular and General.	Palate and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	General.	Ocular and General.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	1	...	...	...	...	...	...	...	1	71	...	1	...	...	1	...	...	2	6 and 75
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	1	...	...	...	...	1	85	...	...	1	...	...	...	...	1	5
15 ,, 20	...	1	...	...	...	...	...	...	...	1	15	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	2	...	...	1	...	...	...	...	3	...	...	1	1	...	1	...	...	3	
Percentage on total cases examined in which no Diphtheria bacilli were found ...										2·6	... ...	...	...	...	...	...	...	...	2·6	

NORTH-WESTERN HOSPITAL.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular and General.	Palate and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	General.	Ocular and General.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	10
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	2	4 and 25
3 ,, 4	...	1	...	...	...	...	...	...	...	1	38	...	...	...	...	...	...	...	...	...
4 ,, 5	...	1	...	...	...	...	1	...	...	2	61 and 113	...	...	...	1	...	...	1	2	38 and 92
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	3	6 to 9
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	2	...	...	...	...	1	...	...	3	...	1	1	3	2	...	...	1	8	
Percentage on total cases examined in which no Diphtheria bacilli were found ...										2.09	... ...	...	...	...	...	...	...	...	5·5	

NORTHERN HOSPITAL.

Ages.	Recoveries. Ocular.	Palate.	Vagus.	General.	Ocular, Palate, and General.	Ocular and Palate.	Palate and General.	Ocular and General.	Palate and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.	Deaths. Ocular.	Palate.	Vagus.	General.	Ocular and General.	Palate and Vagus.	Ocular and Vagus.	Total.	Lowest and Highest Day from onset of Disease on which Paralyses appeared.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	1	...	...	...	...	...	...	...	1	47	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	
Percentage on total cases examined in which no Diphtheria bacilli were found ...										2·4	... ...	...	...	...	...	...	...	...	...	

TABLE. XIXA.—Showing Pneumonic Complications with percentage Mortality in cases of Diphtheria in which Diphtheria bacilli were found, and in which Antitoxic Serum was injected.

1895.

Ages	Fountain. Broncho Pneumonia. Cases.	Deaths.	Fountain. Pneumonia, form not stated. Cases.	Deaths.	Fountain. Septic Pneumonia. Cases.	Deaths.	Western. Lobar Pneumonia. Cases.	Deaths.	Western. Pneumonia, form not stated. Cases.	Deaths.	Western. Broncho Pneumonia. Cases.	Deaths.	Western. Septic Pneumonia. Cases.	Deaths.	Western. Bronchitis. Cases.	Deaths.
Under 1...	3	3	...	...	...	...	...	...	1	1	...	...	...	...	...	...
1 to 2...	3	3	1	1	...	...	1	1	1	1	2	1	...	...	...	...
2 ,, 3...	2	2	...	...	...	...	...	...	1	1	2	1	...	...	2	...
3 ,, 4...	4	3	...	...	...	...	...	...	...	...	...	...	...	...	1	...
4 ,, 5...	1	1	...	...	...	...	1	...	1	1	...	...	...	...	...	...
5 ,, 10...	2	2	...	...	...	...	1	...	2	...	2	2	1	1	1	...
10 ,, 15...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Total...	15	14	1	1	1	1	3	1	6	4	7	4	1	1	4	...
Mortality per cent.	...	93·3	...	100·0	...	100·0	...	33·3	...	66·6	...	57·1	...	100·0	...	0·0

Ages	Eastern. Lobar Pneumonia. Cases.	Deaths.	Eastern. Pneumonia, form not stated. Cases.	Deaths.	Eastern. Broncho Pneumonia. Cases.	Deaths.	Eastern. Septic Pneumonia. Cases.	Deaths.	Eastern. Bronchitis. Cases.	Deaths.	South-Eastern. Broncho Pneumonia. Cases.	Deaths.	South-Eastern. Bronchitis. Cases.	Deaths.
Under 1...	...	...	...	...	...	...	...	...	1	1	1	1	...	...
1 to 2...	...	...	2	1	4	4	1	...	2	2	6	5	1	1
2 ,, 3...	...	...	1	1	...	...	...	...	1	...	5	3	1	...
3 ,, 4...	1	...	2	...	2	1	...	...	4	3	1	1	...	...
4 ,, 5...	1	1	1	1	...	...	...	...	2	2	2	2	...	...
5 ,, 10...	...	...	1	1	1	1	2	2	2	1	2	1	...	...
10 ,, 15...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Total...	2	1	7	4	7	6	3	2	12	9	17	13	3	1
Mortality per cent.	...	50·0	...	57·1	...	85·7	...	66·6	...	75·0	...	76·4	...	33·3

Ages	South-Western. Broncho Pneumonia. Cases.	Deaths.	South-Western. Apical Pneumonia. Cases.	Deaths.	South-Western. Bronchitis. Cases.	Deaths.	North-Western. Broncho Pneumonia. Cases.	Deaths.	North-Western. Bronchitis. Cases.	Deaths.	North-Eastern. Broncho Pneumonia. Cases.	Deaths.
Under 1...	...	...	1	...	...	...	...	...	...	...	...	...
1 to 2...	5	4	...	...	1	1	6	4	...	...	...	...
2 ,, 3...	1	1	...	...	1	1	2	1	...	...	...	...
3 ,, 4...	...	...	...	...	...	...	1	1	...	...	...	...
4 ,, 5...	5	3	...	...	...	...	...	...	...	...	1	1
5 ,, 10...	2	1	...	...	...	...	...	...	...	...	...	...
10 ,, 15...	...	...	...	...	...	...	1	1	...	...	...	...
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	1	...	...	...
Total...	13	9	1	...	2	2	10	7	1	...	1	1
Mortality per cent.	...	69·2	...	0·0	...	100·0	...	70·0	..	0·0	...	100·0

1896.

Ages.	Fountain. Pneumonia, form not stated. Cases.	Deaths.	Fountain. Broncho Pneumonia. Cases.	Deaths.	Fountain. Septic Pneumonia. Cases.	Deaths.	Fountain. Bronchitis. Cases.	Deaths.	Western. Lobar Pneumonia. Cases.	Deaths.	Western. Broncho Pneumonia. Cases.	Deaths.	Western. Bronchitis. Cases.	Deaths.
Under 1...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
1 to 2...	...	...	2	2	...	...	1	...	2	2	5	4	2	2
2 ,, 3...	...	...	4	2	...	...	1	...	...	...	12	6	2	...
3 ,, 4...	...	...	3	3	1	1	1	1	2	1	4	2	2	...
4 ,, 5...	...	...	...	...	...	...	2	1	...	...	3	3	...	...
5 ,, 10...	1	...	1	...	1	1	2	1	2	1	...	...	1	...
10 ,, 15...	...	...	...	...	...	...	...	...	...	...	1	1	...	...
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total...	1	...	10	7	2	2	7	3	6	4	26	16	8	2
Mortality per cent.	...	0·0	...	70·0	...	100·0	...	42·8	...	66·6	...	61·5	...	25·0

Ages.	Eastern. Pneumonia, form not stated. Cases.	Deaths.	Eastern. Broncho Pneumonia. Cases.	Deaths.	Eastern. Bronchitis. Cases.	Deaths.	South-Eastern. Broncho Pneumonia. Cases.	Deaths.	South-Eastern. Bronchitis. Cases.	Deaths.	South-Western. Broncho Pneumonia. Cases.	Deaths.	South-Western. Bronchitis. Cases.	Deaths.
Under 1...	...	...	...	...	1	...	1	...	...	...	...	...	...	...
1 to 2...	...	...	5	1	1	...	2	2	4	2	1	1	2	2
2 ,, 3...	...	...	3	2	3	2	1	1	1	1	2	1	1	...
3 ,, 4...	2	...	4	...	...	...	1	1	4	...	1	...	...	...
4 ,, 5...	2	1	1	1	...	...	...	...	...	...	...	...	2	...
5 ,, 10...	...	...	2	2	...	...	...	...	...	...	1	...	1	...
10 ,, 15...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total...	4	1	15	6	7	2	5	4	9	3	5	2	6	2
Mortality per cent.	...	25·0	...	40·0	...	28·5	...	80·0	...	33·3	...	40·0	...	33·3

Ages.	North-Western. Lobar Pneumonia. Cases.	Deaths.	North-Western. Broncho Pneumonia. Cases.	Deaths.	North-Western. Bronchitis. Cases.	Deaths.	North-East'rn. Broncho Pneumonia. Cases.	Deaths.	Brook. Pneumonia, form not stated. Cases.	Deaths.	Brook. Broncho Pneumonia. Cases.	Deaths.	Brook. Bronchitis. Cases.	Deaths.	Northern. Pneumonia, form not stated. Cases.	Deaths.	Northern. Bronchitis. Cases.	Deaths.	Gore Farm. Broncho Pneumonia. Cases.	Deaths.
Under 1...	...	...	1	1	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...
1 to 2...	1	1	4	1	2	1	2	1	...	...	...	...	1	...	...	...	...	...	...	...
2 ,, 3...	...	...	1	...	...	...	...	...	1	...	1	...	1	1	...	...	...	...	...	...
3 ,, 4...	...	...	...	...	6	3	...	...	...	...	1	...	...	...	...	...	1	...	...	...
4 ,, 5...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
5 ,, 10...	...	...	1	...	...	...	...	...	...	...	...	...	2	...	2	...	...	...	1	...
10 ,, 15...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total...	1	1	7	2	9	4	2	1	1	...	5	1	4	1	2	...	2	...	1	...
Mortality per cent.	...	100·0	...	28·5	...	44·4	...	50·0	...	0·0	...	20·0	...	25·0	...	0·0	...	0·0	...	0·0

TABLE XX.—Showing Pneumonic Complications with percentage Mortality in cases of Diphtheria in which Diphtheria bacilli were found, and in which no Antitoxic Serum was injected.

1895.

Ages.	Fountain.										Western.						Eastern.								South-Eastern.				South-Western.				North-Western.								North-Eastern.			
	Lobar Pneumonia.		Pneumonia, form not stated.		Broncho Pneumonia.		Septic Pneumonia		Bronchitis.		Lobar Pneumonia.		Broncho Pneumonia.		Bronchitis.		Lobar Pneumonia.		Pneumonia, form not stated.		Broncho Pneumonia.		Bronchitis.		Broncho Pneumonia.		Bronchitis.		Broncho Pneumonia.		Bronchitis.		Lobar Pneumonia.		Pneumonia, form not stated.		Broncho Pneumonia.		Bronchitis.		Pneumonia, form not stated.		Broncho Pneumonia.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 ...	...	...	...	...	1	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2 ..	...	...	...	...	2	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	1	1	2	2	...	...	1	...	...	...	...	...	2	1	...	...	4	4	...	...	2	1	...	...
2 ,, 3 ...	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	2	2	1	...	...	...	...	...	...	2	1	...	...	1	1	1	1	...	...	...	...	2	1
3 ,, 4 ...	...	...	...	...	2	1	...	...	2	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	2	2	1	...	...	...	...	...
4 ,, 5 ...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	3	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10 ...	...	...	...	...	1	...	1	1	...	...	1	1	...	...	...	...	2	1	1	1	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	1	1	2	...	...	...	...	...
10 ,, 15 ...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	1	...	...	...	...	...	...
15 ,, 20 ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	...	...	2	1	9	6	1	1	4	1	2	2	1	...	1	...	3	1	3	3	4	3	7	3	3	1	2	...	1	...	3	1	3	1	1	1	9	9	3	...	2	1	2	1
Mortality per cent.	...	0·0	...	50·0	...	66·6	...	100·0	...	25·0	...	100·0	...	0·0	...	0·0	...	33·3	...	100·0	...	75·0	...	42·8	...	33·3	...	0·0	...	0·0	...	33·3	...	33·3	...	100·0	...	100·0	...	0·0	...	50·0	...	50·0

1896.

Ages.	Fountain.						Western.						Eastern.						South-Eastern.						South-Western.				North-Western.				North-Eastern.		Gore Farm.	
	Pneumonia, form not stated.		Broncho Pneumonia.		Bronchitis.		Lobar Pneumonia.		Broncho Pneumonia.		Bronchitis.		Pneumonia, form not stated.		Broncho Pneumonia.		Bronchitis.		Pneumonia, form not stated.		Broncho Pneumonia.		Bronchitis.		Pneumonia, form not stated.		Bronchitis.		Lobar Pneumonia.		Broncho Pneumonia.		Lobar Pneumonia.		Pneumonia, form not stated.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	1	1	...	...	...	...	...	...
2 ,, 3	...	...	1	...	...	...	...	...	2	2	...	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
3 ,, 4	...	...	4	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	1	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...
5 ,, 10	1	...	...	...	...	...	...	...	1	...	3	...	1	...	...	...	1	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	...	5	2	2	2	1	...	3	2	3	...	1	...	4	2	3	...	1	1	2	...	3	1	1	...	1	...	1	1	4	1	1	...	1	...
Mortality per cent.	...	0·0	...	40·0	...	100·0	...	0·0	...	66·6	...	0·0	...	0·0	...	50·0	...	0·0	...	100·0	...	0·0	...	33·3	...	0·0	...	0·0	...	100·0	...	25·0	...	0·0	...	0·0

TABLE XXIA.—Showing Pneumonic Complications with percentage Mortality in cases in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected.

1895.

Ages.	FOUNTAIN. Broncho Pneumonia. Cases.	Deaths.	WESTERN. Lobar Pneumonia. Cases.	Deaths.	WESTERN. Pneumonia, form not stated. Cases.	Deaths.	WESTERN. Broncho Pneumonia. Cases.	Deaths.	WESTERN. Bronchitis. Cases.	Deaths.	EASTERN. Lobar Pneumonia. Cases.	Deaths.	EASTERN. Pneumonia, form not stated. Cases.	Deaths.	EASTERN. Broncho Pneumonia. Cases.	Deaths.	EASTERN. Apical Pneumonia. Cases.	Deaths.	EASTERN. Bronchitis. Cases.	Deaths.
Under 1	...	...	...	...	...	...	...	...	...	...	1	1	1	1	...	...	...	...	...	...
1 to 2	1	1	1	1	...	...	2	1	...	...	...	...	1	1	...	...	...	...	3	2
2 ,, 3	...	...	1	...	1	1	...	...	1	...	...	...	...	...	2	1	...	...	...	...
3 ,, 4	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	1	3	1	1	1	3	2	1	...	1	1	2	2	3	2	1	...	3	2
Mortality per cent. ...	...	100·0	...	33·0	...	100·0	...	66·6	...	0·0	...	100·0	...	100·0	...	66·6	...	0·0	...	66·6

Ages.	SOUTH-EASTERN. Broncho Pneumonia. Cases.	Deaths.	SOUTH-EASTERN. Septic Pneumonia. Cases.	Deaths.	SOUTH-EASTERN. Bronchitis. Cases.	Deaths.	SOUTH-WESTERN. Broncho Pneumonia. Cases.	Deaths.	SOUTH-WESTERN. Bronchitis. Cases.	Deaths.	NORTH-WESTERN. Pneumonia, form not stated. Cases.	Deaths.	NORTH-WESTERN. Broncho Pneumonia. Cases.	Deaths.	NORTH-WESTERN. Bronchitis. Cases.	Deaths.
Under 1	...	...	...	...	...	...	...	...	2	2	...	...	...	...	1	1
1 to 2	...	...	...	...	...	...	...	...	...	...	1	1	2	2	1	1
2 ,, 3	...	...	...	...	...	...	1	...	...	...	...	...	1	1	...	...
3 ,, 4	...	...	1	1	...	...	3	3	...	...	...	...	1	1	...	...
4 ,, 5	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...
5 ,, 10	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards... ...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...
Total	1	1	1	1	1	1	4	3	3	2	2	2	5	5	2	2
Mortality per cent. ...	...	100·0	...	100·0	...	100·0	...	75·0	...	66·6	...	100·0	...	100·0	...	100·0

1896.

Ages.	FOUNTAIN. Pneumonia, form not stated. Cases.	Deaths.	FOUNTAIN. Broncho Pneumonia. Cases.	Deaths.	FOUNTAIN. Bronchitis. Cases.	Deaths.	WESTERN. Lobar Pneumonia. Cases.	Deaths.	WESTERN. Broncho Pneumonia. Cases.	Deaths.	WESTERN. Bronchitis. Cases.	Deaths.	EASTERN. Pneumonia, form not stated. Cases.	Deaths.	EASTERN. Broncho Pneumonia. Cases.	Deaths.	EASTERN. Bronchitis. Cases.	Deaths.
Under 1	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...
2 ,, 3	1	1	...	...	...	...	...	...	...	...	2	1	...	...	...	...	1	...
3 ,, 4	...	...	...	...	1	...	...	...	1	1	...	...	...	...	...	...	1	1
4 ,, 5	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...
5 ,, 10	...	...	...	...	...	...	1	...	1	...	1	...	1	...	...	...	...	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	1	1	1	1	...	1	...	3	2	4	1	2	...	2	2	2	1
Mortality per cent. ...	...	100·0	...	100·0	...	0·0	...	0·0	...	66·6	...	25·0	...	0·0	...	100 0	...	50·0

Ages.	SOUTH-EASTERN. Lobar Pneumonia. Cases.	Deaths.	SOUTH-EASTERN. Pneumonia, form not stated. Cases.	Deaths.	SOUTH-EASTERN. Broncho Pneumonia. Cases.	Deaths.	SOUTH-EASTERN. Double Pneumonia. Cases.	Deaths.	NORTH-WESTERN. Pneumonia, form not stated. Cases.	Deaths.	NORTH-WESTERN. Broncho Pneumonia. Cases.	Deaths.	NORTH-WESTERN. Bronchitis. Cases.	Deaths.	NORTHERN. Broncho Pneumonia. Cases.	Deaths.	NORTHERN. Bronchitis. Cases.	Deaths.
Under 1	...	...	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	1	1	2	2	...	...	...	...
2 ,, 3	1	...	...	...	1	1	1	1	1	1	1	1	...	...	...	...	...	...
3 ,, 4	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	1	...
10 ,, 15	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	2	...	2	2	1	1	2	2	1	1	2	2	2	2	2	1	1	...
Mortality per cent. ...	...	0·0	...	100·0	...	100·0	...	100·0	...	100·0	...	100·0	...	100·0	...	50·0	...	0·0

TABLE XXIIA.—Showing Pneumonic Complications with percentage Mortality in cases in which no Diphtheria bacilli were found and no Antitoxic Serum was injected.

1895.

Ages	Fountain. Broncho Pneumonia. Cases.	Fountain. Broncho Pneumonia. Deaths.	Fountain. Septic Pneumonia. Cases.	Fountain. Septic Pneumonia. Deaths.	Fountain. Pneumonia, form not stated. Cases.	Fountain. Pneumonia, form not stated. Deaths.	Fountain. Bronchitis. Cases.	Fountain. Bronchitis. Deaths.	Western. Lobar Pneumonia. Cases.	Western. Lobar Pneumonia. Deaths.	Western. Broncho Pneumonia. Cases.	Western. Broncho Pneumonia. Deaths.	Western. Pneumonia, form not stated. Cases.	Western. Pneumonia, form not stated. Deaths.	Western. Bronchitis. Cases.	Western. Bronchitis. Deaths.	Eastern. Lobar Pneumonia. Cases.	Eastern. Lobar Pneumonia. Deaths.	Eastern. Pneumonia, form not stated. Cases.	Eastern. Pneumonia, form not stated. Deaths.	Eastern. Broncho Pneumonia. Cases.	Eastern. Broncho Pneumonia. Deaths.	Eastern. Septic Pneumonia. Cases.	Eastern. Septic Pneumonia. Deaths.	Eastern. Bronchitis. Cases.	Eastern. Bronchitis. Deaths.
Under 1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
1 to 2	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1	...	...	...	...	3	2
2 ,, 3	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	2	2
3 ,, 4	2	1	...	...	...	...	...	...	...	...	2	2	...	...	...	...	...	...	...	...	2	...	...	...	2	1
4 ,, 5	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	3	1	...	...	1	1	...	...	1	...	...	...	...	...	...	...	2	...	...	...	...	...	1	1	1	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
20 and upwards	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	7	3	1	1	1	1	2	...	1	...	3	3	2	...	1	...	2	...	2	2	2	...	1	1	10	5
Mortality per cent.	...	42·8	...	100·0	...	100·0	...	0·0	...	0·0	...	100·0	...	0·0	...	0·0	...	0·0	...	100·0	...	0·0	...	100·0	...	50·0

Ages	South-Eastern. Lobar Pneumonia. Cases.	South-Eastern. Lobar Pneumonia. Deaths.	South-Eastern. Pneumonia, form not stated. Cases.	South-Eastern. Pneumonia, form not stated. Deaths.	South-Eastern. Broncho Pneumonia. Cases.	South-Eastern. Broncho Pneumonia. Deaths.	South-Eastern. Bronchitis. Cases.	South-Eastern. Bronchitis. Deaths.	South-Western. Pneumonia, form not stated. Cases.	South-Western. Pneumonia, form not stated. Deaths.	South-Western. Broncho Pneumonia. Cases.	South-Western. Broncho Pneumonia. Deaths.	South-Western. Bronchitis. Cases.	South-Western. Bronchitis. Deaths.	North-Western. Pneumonia, form not stated. Cases.	North-Western. Pneumonia, form not stated. Deaths.	North-Western. Broncho Pneumonia. Cases.	North-Western. Broncho Pneumonia. Deaths.	North-Western. Bronchitis. Cases.	North-Western. Bronchitis. Deaths.	North-Eastern. Pneumonia, form not stated. Cases.	North-Eastern. Pneumonia, form not stated. Deaths.	North-Eastern. Broncho Pneumonia. Cases.	North-Eastern. Broncho Pneumonia. Deaths.	Northern. Broncho Pneumonia. Cases.	Northern. Broncho Pneumonia. Deaths.
Under 1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	2	2	1	...	1	...	1	...	...	...
3 ,, 4	...	...	...	...	2	1	1	...	...	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	1	1	...	...	...	...	2	1	...	...
5 ,, 10	...	...	1	1	...	...	1	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	1	...	1	1	4	3	2	1	2	1	3	1	2	...	1	1	4	4	2	...	1	...	3	1	1	...
Mortality per cent.	...	0·0	...	100·0	...	75·0	...	50·0	...	50·0	...	33·3	...	0·0	...	100·0	...	100·0	...	0·0	...	0·0	...	33·3	...	0·0

1896.

Ages	Fountain. Pneumonia, form not stated. Cases.	Fountain. Pneumonia, form not stated. Deaths.	Fountain. Broncho Pneumonia. Cases.	Fountain. Broncho Pneumonia. Deaths.	Fountain. Bronchitis. Cases.	Fountain. Bronchitis. Deaths.	Western. Lobar Pneumonia. Cases.	Western. Lobar Pneumonia. Deaths.	Western. Broncho Pneumonia. Cases.	Western. Broncho Pneumonia. Deaths.	Western. Bronchitis. Cases.	Western. Bronchitis. Deaths.	Eastern. Pneumonia, form not stated. Cases.	Eastern. Pneumonia, form not stated. Deaths.	Eastern. Broncho Pneumonia. Cases.	Eastern. Broncho Pneumonia. Deaths.	Eastern. Acute Pneumonia. Cases.	Eastern. Acute Pneumonia. Deaths.	Eastern. Bronchitis. Cases.	Eastern. Bronchitis. Deaths.	South-Eastern. Lobar Pneumonia. Cases.	South-Eastern. Lobar Pneumonia. Deaths.
Under 1	...	...	2	1	...	...	...	...	1	1	...	...	...	...	1	1	...	...	...	...	...	...
1 to 2	...	...	...	...	1	...	...	...	1	...	1	...	...	...	...	...	1	1	1	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	2	1	...	...	...	...	3	3	...	...	...	...	...	...
3 ,, 4	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
4 ,, 5	...	...	3	1	...	...	...	...	1	...	...	...	...	...	1	1	...	...	1	...	...	...
5 ,, 10	...	...	1	...	1	1	1	...	7	3	1	1	1	1	...	...	...	...	3	...	...	...
10 ,, 15	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Total	1	...	7	3	3	1	2	...	12	5	3	1	1	1	5	5	1	1	8	1	1	...
Mortality per cent.	...	0·0	...	42·8	...	33·3	...	0·0	...	41·6	...	33·3	...	100·0	...	100·0	...	100·0	...	12·5	...	0·0

Ages	South-Eastern. Pneumonia, form not stated. Cases.	South-Eastern. Pneumonia, form not stated. Deaths.	South-Eastern. Broncho Pneumonia. Cases.	South-Eastern. Broncho Pneumonia. Deaths.	South-Eastern. Bronchitis. Cases.	South-Eastern. Bronchitis. Deaths.	South-Western. Lobar Pneumonia. Cases.	South-Western. Lobar Pneumonia. Deaths.	South-Western. Broncho Pneumonia. Cases.	South-Western. Broncho Pneumonia. Deaths.	South-Western. Bronchitis. Cases.	South-Western. Bronchitis. Deaths.	North-Western. Broncho Pneumonia. Cases.	North-Western. Broncho Pneumonia. Deaths.	North-Western. Bronchitis. Cases.	North-Western. Bronchitis. Deaths.	North Eastern. Apical Pneumonia. Cases.	North Eastern. Apical Pneumonia. Deaths.	North Eastern. Bronchitis. Cases.	North Eastern. Bronchitis. Deaths.	Brook. Bronchitis. Cases.	Brook. Bronchitis. Deaths.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...
1 to 2	...	...	1	1	1	...	...	...	...	...	1	...	2	2	...	...	...	...	...	...	...	...
2 ,, 3	...	...	...	...	...	...	...	...	...	...	1	1	2	1	...	...	...	...	...	...	...	...
3 ,, 4	...	...	2	1	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...
4 ,, 5	1	...	2	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ,, 10	...	...	1	...	1	...	...	...	1	...	...	...	1	...	1	...	...	...	1	...	...	...
10 ,, 15	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
20 and upwards	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Total	1	...	6	3	3	...	1	...	2	...	4	1	6	4	1	...	1	...	1	...	1	...
Mortality per cent.	...	0·0	...	50·0	...	0·0	...	0·0	...	0·0	...	25·0	...	66·6	...	0·0	...	0·0	...	0·0	...	0·0

TABLE XXIIIA.—Showing the site of the affection in those cases in which Diphtheria bacilli were found and Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1895.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
FOUNTAIN HOSPITAL.																		
Under 1...	3	1	...	...	...	4	4	...	2	...	...	...	...	2	2	...	50·0	0·0
1 to 2...	6	3	6	...	2	17	9	8	1	1	3	...	2	7	2	5	22·2	62·5
2 ,, 3...	16	6	7	...	1	30	22	8	4	3	3	...	1	11	7	4	31·8	50·0
3 ,, 4...	30	2	10	...	...	42	32	10	10	1	5	...	...	16	11	5	34·3	50·0
4 ,, 5...	26	7	9	1	4	47	33	14	3	1	2	...	1	7	4	3	12·1	21·4
5 ,, 10...	79	13	12	...	...	104	92	12	22	5	1	...	...	28	27	1	29·3	8·3
10 ,, 15...	30	1	...	...	...	31	31	...	1	1	...	...	...	2	2	...	6·4	0·0
15 ,, 20...	5	...	1	...	...	6	5	1	1	...	1	...	...	2	1	1	20·0	100·0
20 and upwards	6	...	...	...	...	6	6	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	201	33	45	1	7	287	234	53	44	12	15	...	4	75	56	19	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	21·8	36·3	33·3	0·0	57·1	26·1	23·9	35·8	...	...
WESTERN HOSPITAL.																		
Under 1...	1	5	1	...	...	7	6	1	...	1	1	...	...	2	1	1	16·6	100·0
1 to 2...	9	13	3	2	...	27	22	5	2	8	1	1	...	12	10	2	45·4	40·0
2 ,, 3...	21	10	4	2	...	37	31	6	5	3	1	2	...	11	8	3	25·8	50·0
3 ,, 4...	38	24	3	2	...	67	62	5	6	12	2	2	...	22	18	4	29·03	80·0
4 ,, 5...	38	18	5	3	...	64	56	8	8	12	1	1	...	22	20	2	35·7	25·0
5 ,, 10...	113	36	4	3	...	156	149	7	19	12	4	1	...	36	31	5	20·8	71·4
10 ,, 15...	28	6	1	1	...	36	34	2	2	2	...	1	...	5	4	1	11·7	50·0
15 ,, 20...	6	1	...	...	...	7	7	...	2	...	...	...	...	2	2	...	28·5	0·0
20 and upwards	10	1	...	...	...	11	11	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	264	114	21	13	...	412	378	34	44	50	10	8	...	112	94	18	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	16·6	43·8	47·6	61·5	0·0	27·1	24·8	52·9	...	...
EASTERN HOSPITAL.																		
Under 1...	...	3	...	1	...	4	3	1	...	3	...	1	...	4	3	1	100·0	100·0
1 to 2...	8	11	7	5	3	34	19	15	3	5	6	4	2	20	8	12	42·1	80·0
2 ,, 3...	11	6	4	5	...	26	17	9	...	2	1	4	...	7	2	5	11·7	55·5
3 ,, 4...	15	19	8	6	2	50	34	16	4	7	2	3	...	16	11	5	32·3	31·2
4 ,, 5...	16	11	8	6	1	42	27	15	4	8	1	4	...	17	12	5	44·4	33·3
5 ,, 10...	64	28	13	4	2	111	92	19	13	13	3	2	1	32	26	6	28·2	31·5
10 ,, 15...	22	6	...	2	...	30	28	2	4	1	...	1	...	6	5	1	17·8	50·0
15 ,, 20...	3	1	...	...	...	4	4	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	140	85	40	29	8	302	225	77	28	39	13	19	3	102	67	35	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	20·0	45·8	32·5	65·5	37·5	33·7	29·7	45·4	...	...
SOUTH-EASTERN HOSPITAL.																		
Under 1...	3	3	...	...	1	7	6	1	1	2	...	...	...	3	3	...	50·0	0·0
1 to 2...	11	7	4	4	2	28	18	10	4	3	2	3	1	13	7	6	38·8	60·0
2 ,, 3...	22	9	7	2	2	42	31	11	4	3	4	1	...	12	7	5	22·5	45·4
3 ,, 4...	22	8	7	...	5	42	30	12	1	4	3	...	2	10	5	5	16·6	41·6
4 ,, 5...	28	21	10	...	1	60	49	11	6	8	3	...	1	18	14	4	28·5	36·3
5 ,, 10...	121	28	13	3	4	169	149	20	20	12	3	1	1	37	32	5	21·4	25·0
10 ,, 15...	44	6	...	...	...	50	50	...	4	2	...	...	...	6	6	...	12·0	0·0
15 ,, 20...	13	...	...	...	...	13	13	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards	9	...	...	...	...	9	9	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	273	82	41	9	15	420	355	65	40	24	15	5	5	99	74	25	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	14·6	41·4	36·5	55·5	33·3	23·5	20·8	38·4	...	...
SOUTH-WESTERN HOSPITAL.																		
Under 1...	...	4	1	...	...	5	4	1	...	2	1	...	...	3	2	1	50·0	100·0
1 to 2...	13	10	...	3	...	26	23	3	4	8	...	2	...	14	12	2	52·1	66·6
2 ,, 3...	5	18	1	1	...	25	23	2	3	9	...	1	...	13	12	1	52·1	50·0
3 ,, 4...	7	21	1	4	...	33	28	5	2	4	...	1	...	7	6	1	21·4	20·0
4 ,, 5...	13	25	3	3	...	44	38	6	3	12	2	2	...	19	15	4	39·4	66·6
5 ,, 10...	58	64	5	4	...	131	122	9	7	17	2	1	...	27	24	3	19·6	33·3
10 ,, 15...	11	18	...	1	...	30	29	1	...	5	...	1	...	6	5	1	17·2	100·0
15 ,, 20...	3	1	...	...	...	4	4	...	1	...	...	...	...	1	1	...	25·0	0·0
20 and upwards	2	3	...	...	...	5	5	...	...	2	...	...	...	2	2	...	40·0	0·0
Total	112	164	11	16	...	303	276	27	20	59	5	8	...	92	79	13	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	17·8	35·9	45·4	50·0	0·0	30·3	28·6	48·1	...	...

TABLE XXIIIA. (*continued*).—Showing the site of the affection in those cases in which Diphtheria bacilli were found and Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1895.

NORTH-WESTERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	6	1	...	1	...	8	7	1	3	1	...	...	...	4	4	...	57·1	0·0
1 to 2	9	10	7	4	1	31	19	12	3	7	5	3	...	18	10	8	52·6	66·6
2 ,, 3	7	8	3	2	1	21	15	6	1	5	1	1	...	8	6	2	40·0	33·3
3 ,, 4	18	20	4	3	1	46	38	8	5	11	...	1	1	18	16	2	42·1	25·0
4 ,, 5	9	12	7	2	...	30	21	9	3	7	1	2	...	13	10	3	47·6	33·3
5 ,, 10	45	39	4	3	2	93	84	9	4	15	...	...	...	19	19	...	22·6	0·0
10 ,, 15	16	8	...	...	...	24	24	...	2	3	...	...	...	5	5	...	20·8	0·0
15 ,, 20	6	1	...	...	...	7	7	...	1	1	...	...	...	2	2	...	28·5	0·0
20 and upwards ...	14	1	...	...	...	15	15	...	1	...	...	...	...	1	1	...	6·6	0·0
Total	130	100	25	15	5	275	230	45	23	50	7	7	1	88	73	15	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	17·6	50·0	28·0	46·6	20·0	32·0	31·7	33·3	...	...

NORTHERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	7	1	2	...	1	11	8	3	...	...	1	...	...	1	...	1	0·0	33·3
4 ,, 5	7	1	2	...	...	10	8	2	1	...	1	...	...	2	1	1	12·5	50·0
5 ,, 10	19	8	2	...	...	29	27	2	1	...	1	...	...	2	1	1	3·7	50·0
10 ,, 15	12	1	...	...	...	13	13	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	51	11	6	...	1	69	62	7	2	...	3	...	...	5	2	3	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	3·9	0·0	50·0	0·0	0·0	7·2	3·2	42·8	...	...

TABLE XXIIIA. (*continued*).—Showing the site of the affection in those cases in which Diphtheria bacilli were found and Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1896.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
FOUNTAIN HOSPITAL.																		
Under 1...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	14	15	3	2	1	35	29	6	4	11	1	2	1	19	15	4	51·7	66·6
2 ,, 3...	28	13	6	4	2	53	41	12	7	5	2	..	...	14	12	2	29·2	16·6
3 ,, 4...	50	23	11	3	3	90	73	17	10	11	2	3	2	28	21	7	28·7	41·1
4 ,, 5...	63	21	8	2	2	96	84	12	11	7	3	2	...	23	18	5	21·4	41·6
5 ,, 10...	196	63	11	...	6	276	259	17	25	24	4	...	1	54	49	5	18·9	29·4
10 ,, 15...	47	13	...	...	...	60	60	...	3	3	...	...	...	6	6	...	10·0	0·0
15 ,, 20...	8	...	...	...	...	8	8	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	19	...	...	...	...	19	19	...	1	...	...	...	...	1	1	...	5·2	0·0
Total	426	148	39	11	14	638	574	64	61	61	12	7	4	145	122	23	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	14·3	41·2	30·7	63·6	28·5	22·7	21·2	35·9	...	...
WESTERN HOSPITAL.																		
Under 1...	5	5	1	2	...	13	10	3	...	3	1	1	...	5	3	2	30·0	66·6
1 to 2...	11	25	3	4	1	44	36	8	6	9	3	3	1	22	15	7	41·6	87·5
2 ,, 3...	33	28	12	3	1	77	61	16	4	15	6	1	1	27	19	8	31·1	50·0
3 ,, 4...	49	38	8	1	...	96	87	9	9	12	1	...	...	22	21	1	24·1	11·1
4 ,, 5...	39	38	10	2	...	89	77	12	4	19	6	1	...	30	23	7	29·8	58·3
5 ,, 10...	117	73	22	7	1	220	190	30	6	23	8	2	...	39	29	10	15·2	33·3
10 ,, 15...	25	16	...	...	...	41	41	...	2	5	...	...	...	7	7	...	17·07	0·0
15 ,, 20...	10	4	...	...	...	14	14	...	...	2	...	...	...	2	2	...	14·2	0·0
20 and upwards ...	15	4	...	...	...	19	19	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	304	231	56	19	3	613	535	78	31	88	25	8	2	154	119	35	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	10·1	38·09	44·6	42·1	66·6	25·1	22·2	44·8	...	...
EASTERN HOSPITAL.																		
Under 1...	4	4	...	...	...	8	8	...	1	1	...	...	...	2	2	...	25·0	0·0
1 to 2...	7	7	7	4	...	25	14	11	2	1	...	1	...	4	3	1	21·4	9·09
2 ,, 3...	21	17	7	...	...	45	38	7	4	5	4	...	...	13	9	4	23·6	57·1
3 ,, 4...	37	22	18	...	...	77	59	18	9	7	2	...	...	18	16	2	27·1	11·1
4 ,, 5...	46	19	9	1	...	75	65	10	8	9	3	...	...	20	17	3	26·1	30·0
5 ,, 10...	136	34	19	2	...	191	170	21	16	12	3	1	...	32	28	4	16·4	19·04
10 ,, 15...	39	6	5	...	...	50	45	5	3	2	...	...	...	5	5	...	11·1	0·0
15 ,, 20...	4	...	...	...	...	4	4	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	15	1	...	...	...	16	16	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	309	110	65	7	...	491	419	72	43	37	12	2	...	94	80	14	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	13·9	33·6	18·4	28·5	0·0	19·1	19·09	19·4	...	...
SOUTH-EASTERN HOSPITAL.																		
Under 1...	9	5	1	...	...	15	14	1	2	4	1	...	...	7	6	1	42·8	100·0
1 to 2...	9	9	10	2	3	33	18	15	2	5	4	2	2	15	7	8	38·8	53·3
2 ,, 3...	28	7	13	...	3	51	35	16	7	1	6	...	1	15	8	7	22·8	43·7
3 ,, 4...	43	11	19	3	1	77	54	23	11	6	2	1	...	20	17	3	31·4	13·04
4 ,, 5...	51	12	15	2	4	84	63	21	5	3	2	1	...	11	8	3	12·6	14·2
5 ,, 10...	139	35	16	...	1	191	174	17	19	10	2	...	1	32	29	3	16·6	17·6
10 ,, 15...	32	6	2	...	1	41	38	3	5	1	1	...	...	7	6	1	15·7	33·3
15 ,, 20...	5	3	...	...	...	8	8	...	...	2	...	...	...	2	2	...	25·0	0·0
20 and upwards ...	8	1	...	...	...	9	9	...	2	...	...	...	...	2	2	...	22·2	0·0
Total	324	89	76	7	13	509	413	96	53	32	18	4	4	111	85	26	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	16·3	35·9	23·6	57·1	30·7	21·8	20·5	27·08	...	...
SOUTH-WESTERN HOSPITAL.																		
Under 1...	1	7	...	...	...	8	8	...	...	2	...	...	...	2	2	...	25·0	0.0
1 to 2...	1	5	2	3	...	11	6	5	...	2	1	2	...	5	2	3	33·3	60·0
2 ,, 3...	7	10	5	3	...	25	17	8	2	1	1	2	...	6	3	3	17·6	37·5
3 ,, 4...	6	18	1	3	...	28	24	4	...	2	1	1	...	4	2	2	8·3	50·0
4 ,, 5...	15	18	4	4	...	41	33	8	...	6	...	2	...	8	6	2	18·1	25·0
5 ,, 10...	58	74	9	9	...	150	132	18	10	24	...	4	...	38	34	4	25·7	22·2
10 ,, 15...	22	18	...	...	...	40	40	...	1	4	...	...	...	5	5	...	12·5	0·0
15 ,, 20...	...	1	...	...	...	1	1	...	...	1	...	...	...	1	1	...	100·0	0·0
20 and upwards ...	4	3	...	...	...	7	7	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	114	154	21	22	...	311	268	43	13	42	3	11	...	69	55	14	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	11·4	27·2	14·2	50·0	0·0	22·1	20·5	32·5	...	...

TABLE XXIIIA. (*continued*).—Showing the site of the affection in those cases in which Diphtheria bacilli were found and Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1896.

NORTH-WESTERN HOSPITAL.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1...	3	...	1	...	...	4	3	1	1	...	1	...	...	2	1	1	33·3	100·0
1 to 2...	12	6	6	2	...	26	18	8	4	5	2	2	...	13	9	4	50·0	50·0
2 ,, 3...	20	8	6	1	2	37	28	9	8	3	2	1	...	14	11	3	39·2	33·3
3 ,, 4...	39	11	5	2	2	59	50	9	11	4	2	...	1	18	15	3	30·0	33·3
4 ,, 5...	37	8	6	3	1	55	45	10	10	7	3	2	1	23	17	6	37·7	60·0
5 ,, 10...	96	40	10	6	1	153	136	17	20	24	1	4	...	49	44	5	32·3	29·4
10 ,, 15...	14	1	1	...	...	16	15	1	1	...	1	...	...	2	1	1	6·6	100·0
15 ,, 20...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	225	74	35	14	6	354	299	55	55	43	12	9	2	121	98	23	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	24.4	58·1	34·2	64·2	33·3	34·1	32·7	41·8	...	...

NORTH-EASTERN HOSPITAL.

Ages.	Cases: Faucial.	Cases: Faucial and Nasal.	Cases: Faucial and Laryngeal.	Cases: Faucial, Laryngeal, and Nasal.	Cases: Laryngeal.	Cases: Total.	Total Cases: Faucial.	Total Cases: Laryngeal.	Deaths: Faucial.	Deaths: Faucial and Nasal.	Deaths: Faucial and Laryngeal.	Deaths: Faucial, Laryngeal, and Nasal.	Deaths: Laryngeal.	Deaths: Total.	Total Deaths: Faucial.	Total Deaths: Laryngeal.	Mortality per cent.: Faucial.	Mortality per cent.: Laryngeal.
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	...	...	...	1	...	1	...	1	...	...	...	1	...	1	...	1	0·0	100·0
2 ,, 3...	2	...	...	1	...	3	2	1	...	...	...	1	...	1	...	1	0·0	100·0
3 ,, 4...	...	...	1	...	...	1	...	1	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5...	1	2	2	...	...	5	3	2	...	1	...	...	...	1	1	...	33·3	0·0
5 ,, 10...	1	2	2	...	...	5	3	2	...	2	1	...	...	3	2	1	66·6	50·0
10 ,, 15...	2	...	...	...	...	2	2	...	1	...	...	...	...	1	1	...	50·0	0·0
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	7	4	5	2	...	18	11	7	1	3	1	2	...	7	4	3	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	14·2	75·0	20·0	100·0	0·0	38·8	36·3	42·8	...	...

BROOK HOSPITAL.

Ages.	Cases: Faucial.	Cases: Faucial and Nasal.	Cases: Faucial and Laryngeal.	Cases: Faucial, Laryngeal, and Nasal.	Cases: Laryngeal.	Cases: Total.	Total Cases: Faucial.	Total Cases: Laryngeal.	Deaths: Faucial.	Deaths: Faucial and Nasal.	Deaths: Faucial and Laryngeal.	Deaths: Faucial, Laryngeal, and Nasal.	Deaths: Laryngeal.	Deaths: Total.	Total Deaths: Faucial.	Total Deaths: Laryngeal.	Mortality per cent.: Faucial.	Mortality per cent.: Laryngeal.
Under 1...	4	1	1	...	...	6	5	1	...	...	1	...	...	1	...	1	0·0	100·0
1 to 2...	1	6	2	3	1	13	7	6	...	3	...	2	1	6	3	3	42·8	50·0
2 ,, 3...	5	5	3	...	...	13	10	3	...	...	2	...	...	2	...	2	0·0	66·6
3 ,, 4...	7	15	1	...	1	24	22	2	1	4	...	...	...	5	5	...	22·7	0·0
4 ,, 5...	9	11	2	2	...	24	20	4	2	5	1	...	...	8	7	1	35·0	25·0
5 ,, 10...	36	31	5	...	1	73	67	6	5	11	1	...	...	17	16	1	23·8	16·6
10 ,, 15...	8	4	...	...	...	12	12	...	...	1	...	...	...	1	1	...	8·3	0·0
15 ,, 20...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	3	1	...	...	...	4	4	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	75	74	14	5	3	171	149	22	8	24	5	2	1	40	32	8	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	10·6	32·4	35·7	40·0	33·3	23·3	21·4	36·3	...	...

NORTHERN HOSPITAL.

Ages.	Cases: Faucial.	Cases: Faucial and Nasal.	Cases: Faucial and Laryngeal.	Cases: Faucial, Laryngeal, and Nasal.	Cases: Laryngeal.	Cases: Total.	Total Cases: Faucial.	Total Cases: Laryngeal.	Deaths: Faucial.	Deaths: Faucial and Nasal.	Deaths: Faucial and Laryngeal.	Deaths: Faucial, Laryngeal, and Nasal.	Deaths: Laryngeal.	Deaths: Total.	Total Deaths: Faucial.	Total Deaths: Laryngeal.	Mortality per cent.: Faucial.	Mortality per cent.: Laryngeal.
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4...	18	4	3	1	...	26	22	4	1	...	...	...	...	1	1	...	4·5	0·0
4 ,, 5...	13	2	...	...	...	15	15	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10...	89	7	1	...	...	97	96	1	2	...	...	...	...	2	2	...	2·08	0·0
10 ,, 15...	29	2	...	...	...	31	31	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 10...	7	...	...	...	...	7	7	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	159	15	4	1	...	179	174	5	3	...	...	...	...	3	3	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	1·8	0·0	0·0	0·0	0·0	1·6	1·7	0·0	...	...

GORE FARM HOSPITAL.

Ages.	Cases: Faucial.	Cases: Faucial and Nasal.	Cases: Faucial and Laryngeal.	Cases: Faucial, Laryngeal, and Nasal.	Cases: Laryngeal.	Cases: Total.	Total Cases: Faucial.	Total Cases: Laryngeal.	Deaths: Faucial.	Deaths: Faucial and Nasal.	Deaths: Faucial and Laryngeal.	Deaths: Faucial, Laryngeal, and Nasal.	Deaths: Laryngeal.	Deaths: Total.	Total Deaths: Faucial.	Total Deaths: Laryngeal.	Mortality per cent.: Faucial.	Mortality per cent.: Laryngeal.
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4...	3	...	...	...	1	4	3	1	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5...	8	...	...	...	...	8	8	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10...	32	...	2	...	...	34	32	2	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15...	10	...	...	...	...	10	10	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	54	...	2	...	1	57	54	3	...	...	...	...	...	...	...	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	...	..

TABLE XXIVA.—Showing the site of the affection in those cases in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1895.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
FOUNTAIN HOSPITAL.																		
Under 1	4	2	...	...	...	6	6	...	2	...	...	...	...	2	2	...	33·3	0·0
1 to 2	14	1	4	...	1	20	15	5	3	...	3	...	...	6	3	3	20·0	60·0
2 ,, 3	26	1	4	...	...	31	27	4	6	...	4	...	...	10	6	4	22·2	100·0
3 ,, 4	29	4	1	...	...	34	33	1	10	1	1	...	...	12	11	1	33·3	100·0
4 ,, 5	35	3	1	...	...	39	38	1	3	...	...	...	...	3	3	...	7·8	0·0
5 ,, 10	142	7	3	...	...	152	149	3	10	1	...	...	...	11	11	...	7·3	0·0
10 ,, 15	61	1	...	...	1	63	62	1	2	...	...	...	...	2	2	...	3·2	0·0
15 ,, 20	29	...	...	...	...	29	29	...	2	...	...	...	...	2	2	...	6·9	0·0
20 and upwards ...	25	1	...	...	...	26	26	...	1	1	...	...	...	2	2	...	7·6	0·0
Total	365	20	13	...	2	400	385	15	39	3	8	...	...	50	42	8	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	10·6	15·0	61·5	0·0	0·0	12·5	10·9	53·3	...	...
WESTERN HOSPITAL.																		
Under 1	2	1	...	...	...	3	3	...	...	...	...	...	...	..	...	...	0·0	0·0
1 to 2	1	3	1	...	...	5	4	1	...	3	...	...	...	3	3	...	75·0	0·0
2 ,, 3	10	2	1	...	...	13	12	1	...	1	...	...	...	1	1	...	8·3	0·0
3 ,, 4	17	5	...	...	...	22	22	...	2	3	...	...	...	5	5	...	22·7	0·0
4 ,, 5	11	6	2	...	...	19	17	2	...	2	...	...	...	2	2	...	11·7	0·0
5 ,, 10	41	5	5	...	...	51	46	5	2	1	1	...	...	4	3	1	6·5	20·0
10 ,, 15	27	...	...	...	...	27	27	...	1	...	...	...	...	1	1	...	3·7	0·0
15 ,, 20	10	1	...	...	...	11	11	...	1	...	...	...	...	1	1	...	9·09	0·0
20 and upwards ...	38	...	...	...	...	38	38	...	1	...	...	...	...	1	1	...	2·6	0·0
Total	157	23	9	...	...	189	180	9	7	10	1	...	...	18	17	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	4·4	43·4	11·1	0·0	0·0	9·5	9·4	11·1	...	...
EASTERN HOSPITAL.																		
Under 1	1	1	1	...	...	3	2	1	1	...	1	...	...	2	1	1	50·0	100·0
1 to 2	1	6	2	...	1	10	7	3	...	6	1	...	1	8	6	2	85·5	66·6
2 ,, 3	11	17	4	3	...	35	28	7	3	7	3	2	...	15	10	5	35·7	71·4
3 ,, 4	18	10	3	1	3	35	28	7	4	6	1	1	...	12	10	2	35·7	28·5
4 ,, 5	29	11	4	4	1	49	40	9	3	6	1	3	...	13	9	4	22·5	44·4
5 ,, 10	100	21	12	4	3	140	121	19	11	9	3	4	1	28	20	8	16·5	42·1
10 ,, 15	68	7	1	...	...	76	75	1	3	1	...	...	...	4	4	...	5·3	0·0
15 ,, 20	27	...	...	...	...	27	27	...	1	...	...	...	...	1	1	...	3·7	0·0
20 and upwards ...	28	3	...	...	...	31	31	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	283	76	27	12	8	406	359	47	26	35	10	10	2	83	61	22	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	9·1	46·05	37·03	83·3	25·0	20·4	16·9	46·8	...	...
SOUTH-EASTERN HOSPITAL.																		
Under 1	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	1	2	1	...	...	4	3	1	...	...	1	...	...	1	...	1	0·0	100·0
2 ,, 3	4	1	...	...	1	6	5	1	1	1	...	...	1	3	2	1	40·0	100·0
3 ,, 4	6	2	...	...	...	8	8	...	1	..	...	...	...	1	1	...	12·5	0·0
4 ,, 5	8	1	...	...	...	9	9	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	28	5	...	1	...	34	33	1	2	2	...	1	...	5	4	1	12·1	100·0
10 ,, 15	12	2	...	...	...	14	14	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	5	...	...	...	...	5	5	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	13	...	...	...	...	13	13	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	78	13	1	1	1	94	91	3	4	3	1	1	1	10	7	3	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	5·1	23·07	100·0	100·0	100·0	10·6	7·6	100·0	...	...
SOUTH-WESTERN HOSPITAL.																		
Under 1	1	1	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 3	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	4	2	1	...	...	7	6	1	...	...	1	...	...	1	...	1	0·0	100·0
3 ,, 4	5	4	1	...	...	10	9	1	2	...	...	...	...	2	2	...	22·2	0·0
4 ,, 5	7	3	...	...	...	10	10	...	1	..	...	...	...	1	1	...	10·0	0·0
5 ,, 10	46	10	1	...	...	57	56	1	1	1	...	...	...	2	2	...	3·5	0·0
10 ,, 15	22	6	...	...	...	28	28	...	...	1	...	...	...	1	1	...	3·5	0·0
15 ,, 20	11	1	...	...	...	12	12	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	13	1	...	...	...	14	14	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	110	28	3	...	...	141	138	3	4	2	1	...	...	7	6	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	3·6	7·1	33·3	0·0	0·0	4·9	4·3	33·3	...	...

TABLE XXIVA. (*continued*).—Showing the site of the affection in those cases in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1895.

NORTH-WESTERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	2	1	1	...	...	4	3	1	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	10	4	2	1	1	18	14	4	4	2	2	1	...	9	6	3	42·8	75·0
2 ,, 3	21	9	4	...	1	35	30	5	2	8	1	...	...	11	10	1	33·3	20·0
3 ,, 4	30	13	4	2	...	49	43	6	10	2	...	2	...	14	12	2	27·9	33·3
4 ,, 5	23	7	4	3	...	37	30	7	2	4	2	2	...	10	6	4	20·0	57·1
5 ,, 10	99	31	7	...	1	138	130	8	8	12	2	...	...	22	20	2	15·3	25·0
10 ,, 15	32	1	1	...	1	35	33	2	3	...	...	...	...	3	3	...	9·09	0·0
15 ,, 20	10	...	...	...	...	10	10	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	20	...	...	...	...	20	20	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	247	66	23	6	4	346	313	33	29	28	7	5	...	69	57	12	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	11·7	42·4	30·4	83·3	0·0	19·9	18·2	36·3	...	...

NORTH-EASTERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	1	1	1	...	...	3	2	1	...	...	1	...	...	1	...	1	0·0	100·0
2 ,, 3	3	5	3	2	...	13	8	5	...	2	3	2	...	7	2	5	25·0	100·0
3 ,, 4	5	2	2	1	...	10	7	3	...	1	...	1	...	2	1	1	14·2	33·3
4 ,, 5	5	1	...	...	...	6	6	...	1	...	...	...	...	1	1	...	16·6	0·0
5 ,, 10	16	...	2	...	...	18	16	2	...	...	2	...	...	2	...	2	0·0	100·0
10 ,, 15	5	...	...	1	...	6	5	1	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	37	9	8	4	...	58	46	12	1	3	6	3	...	13	4	9	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	2·7	33·3	75·0	75·0	0·0	22·4	8·6	75·0	...	...

NORTHERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	10	1	...	...	...	11	11	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	18	...	...	...	1	19	18	1	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	58	5	...	...	...	63	63	...	...	1	...	...	...	1	1	...	1·5	0·0
10 ,, 15	17	2	...	...	...	19	19	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	7	...	...	...	...	7	7	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	113	8	...	...	1	122	121	1	...	1	...	...	...	1	1	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	12·5	0·0	0·0	0·0	0·8	0·8	0·0	...	...

TABLE XXIVA. (*continued*).—Showing the site of the affection in those cases in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1896.

FOUNTAIN HOSPITAL.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1...	3	1	...	...	...	4	4	...	2	1	...	...	...	3	3	...	75·0	0·0
1 to 2...	5	3	1	...	3	12	8	4	1	2	1	...	3	7	3	4	37·5	100·0
2 ,, 3...	4	4	1	...	1	10	8	2	...	1	...	...	1	2	1	1	12·5	50·0
3 ,, 4...	25	4	...	1	1	31	29	2	3	...	...	1	1	5	3	2	10·3	100·0
4 ,, 5...	23	3	...	...	...	26	26	...	1	1	...	...	...	2	2	...	7·6	0·0
5 ,, 10...	116	10	...	...	...	126	126	...	3	4	...	...	...	7	7	...	5·5	0·0
10 ,, 15...	49	2	...	...	...	51	51	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	20	1	...	...	...	21	21	...	...	...	...	...	...	...	...	...	0·0	0 0
20 and upwards ...	24	1	...	...	...	25	25	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	269	29	2	1	5	306	298	8	10	9	1	1	5	26	19	7	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	3·7	31·03	50·0	100·0	100·0	8·4	6·3	87·5	...	...

WESTERN HOSPITAL.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1...	1	...	...	...	...	1	1	...	1	...	...	...	...	1	1	...	100 0	0·0
1 to 2...	9	...	...	...	...	9	9	...	1	...	...	...	...	1	1	...	11·1	0·0
2 ,, 3...	8	7	...	...	...	15	15	...	2	3	...	...	...	5	5	...	33·3	0·0
3 ,, 4...	14	5	...	...	...	19	19	...	1	1	...	...	...	2	2	...	10·5	0·0
4 ,, 5...	20	8	...	...	...	28	28	...	1	2	...	...	...	3	3	...	10·7	0·0
5 ,, 10...	56	15	...	...	1	72	71	1	1	...	...	...	...	1	1	...	1·4	0·0
10 ,, 15...	44	6	...	...	...	50	50	...	3	...	...	...	...	3	3	...	6·0	0·0
15 ,, 20...	20	1	...	...	...	21	21	...	1	...	...	...	...	1	1	...	4·7	0·0
20 and upwards ...	54	2	...	...	...	56	56	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	226	44	...	...	1	271	270	1	11	6	...	...	...	17	17	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	4·8	13·6	0·0	0·0	0·0	6·2	6·2	0·0	...	...

EASTERN HOSPITAL.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1...	...	1	...	1	...	2	1	1	...	...	...	1	...	1	...	1	0·0	100·0
1 to 2...	3	3	...	...	...	6	6	...	1	1	...	...	...	2	2	...	33·3	0·0
2 ,, 3...	12	2	1	...	...	15	14	1	1	2	...	...	...	3	3	...	21·4	0·0
3 ,, 4...	18	3	...	...	...	21	21	...	2	...	...	...	...	2	2	...	9·5	0·0
4 ,, 5...	17	5	...	...	...	22	22	...	...	1	...	...	...	1	1	...	4·5	0·0
5 ,, 10...	82	4	1	2	...	89	86	3	4	...	...	1	...	5	4	1	4·6	33·3
10 ,, 15...	47	...	...	...	...	47	47	...	1	...	...	...	...	1	1	...	2·1	0·0
15 ,, 20...	6	...	...	...	...	6	6	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	24	2	...	...	...	26	26	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	209	20	2	3	...	234	229	5	9	4	...	2	...	15	13	2	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	4·3	20·0	0·0	66·6	0·0	6·4	5·6	40·0	...	...

SOUTH-EASTERN HOSPITAL.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1...	5	...	...	...	...	5	5	...	2	...	...	...	...	2	2	...	40·0	0·0
1 to 2...	4	3	...	...	...	7	7	...	1	3	...	...	...	4	4	...	57·1	0·0
2 ,, 3...	18	2	1	...	...	21	20	1	5	1	...	...	...	6	6	...	30·0	0·0
3 ,, 4...	9	1	1	...	1	12	10	2	1	...	1	...	1	3	1	2	10·0	100·0
4 ,, 5...	16	3	1	...	...	20	19	1	2	1	1	...	...	4	3	1	15·7	100·0
5 ,, 10...	53	6	2	...	...	61	59	2	5	...	...	...	...	5	5	...	8·4	0·0
10 ,, 15...	25	1	...	...	...	26	26	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	13	...	...	...	...	13	13	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	25	1	...	...	...	26	26	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	168	17	5	...	1	191	185	6	16	5	2	...	1	24	21	3	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	9·5	29·4	40·0	0·0	100·0	12·5	11·3	50·0	...	...

SOUTH-WESTERN HOSPITAL.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1...	1	1	...	...	...	2	2	...	...	1	...	...	...	1	1	...	50·0	0·0
1 to 2...	3	1	...	...	...	4	4	...	2	...	...	...	...	2	2	...	50·0	0·0
2 ,, 3...	2	...	...	...	...	2	2	...	2	...	...	...	...	2	2	...	100·0	0·0
3 ,, 4...	8	1	...	...	...	9	9	...	2	...	...	...	...	2	2	...	22·2	0·0
4 ,, 5...	4	1	...	...	...	5	5	...	1	...	...	...	...	1	1	...	20·0	0·0
5 ,, 10...	61	13	...	...	...	74	74	...	1	1	...	...	...	2	2	...	2·7	0·0
10 ,, 15...	30	5	...	...	...	35	35	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	14	3	...	...	...	17	17	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	22	...	...	...	...	22	22	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	145	25	...	...	...	170	170	...	8	2	...	...	...	10	10	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	5·5	8·0	0·0	0·0	0·0	5·8	5·8	0·0		

TABLE XXIVA. (*continued*).—Showing the site of the affection in those cases in which Diphtheria bacilli were found, but in which no Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1896.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
NORTH-WESTERN HOSPITAL.																		
Under 1...	2	2	...	...	...	4	4	...	...	1	...	...	...	1	1	...	25·0	0·0
1 to 2...	5	5	1	1	...	12	10	2	4	4	1	1	...	10	8	2	80·0	100·0
2 ,, 3...	25	12	3	2	...	42	37	5	7	8	...	1	...	16	15	1	40·5	20.0
3 ,, 4...	26	10	3	1	4	44	36	8	5	9	...	1	1	16	14	2	38·8	25·0
4 ,, 5...	47	8	4	...	...	59	55	4	9	7	1	...	...	17	16	1	29·09	25·0
5 ,, 10...	118	14	6	4	...	142	132	10	17	5	1	3	...	26	22	4	16·6	40·0
10 ,, 15...	46	4	...	...	...	50	50	...	2	...	...	...	...	2	2	...	4·0	0·0
15 ,, 20...	9	1	...	...	...	10	10	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	14	...	...	...	...	14	14	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	292	56	17	8	4	377	348	29	44	34	3	6	1	88	78	10	.	...
Mortality per cent.	...	...	...	...	...	...	...	...	15·06	60·7	17·6	75·0	25·0	23·3	22·4	34·4	...	...
NORTH-EASTERN HOSPITAL.																		
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	...	1	1	...	...	2	1	1	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3...	2	...	...	1	...	3	2	1	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4...	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5...	2	1	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10...	8	1	...	...	...	9	9	...	1	1	...	...	...	2	2	...	22·2	0·0
10 ,, 15...	4	1	...	...	...	5	5	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20... ..	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	23	4	1	1	...	29	27	2	1	1	...	...	...	2	2	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	4·3	25·0	0·0	0·0	0·0	6·8	7·4	0·0	...	...
BROOK HOSPITAL.																		
Under 1...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3...	1	1	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4...	4	1	...	1	...	6	5	1	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5...	3	2	...	...	...	5	5	...	...	1	...	...	...	1	1	...	20·0	0·0
5 ,, 10...	14	7	...	...	...	21	21	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15...	8	1	...	...	...	9	9	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	4	...	...	...	...	4	4	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	4	...	...	...	...	4	4	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	40	12	...	1	...	53	52	1	...	1	...	...	...	1	1	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	8·3	0·0	0·0	0·0	1·8	1·9	0·0	...	...
NORTHERN HOSPITAL.																		
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4...	6	1	...	...	...	7	7	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5...	10	...	...	...	...	10	10	...	...	...	...	...	...	...	...	..	0·0	0·0
5 ,, 10...	32	...	...	...	...	32	32	...	1	...	...	...	...	1	1	...	3·1	0·0
10 ,, 15...	15	1	...	...	...	16	16	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	7	...	...	...	...	7	7	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	70	2	...	...	...	72	72	...	1	...	...	...	...	1	1	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	1·4	0·0	0·0	0·0	0·0	1·3	1·3	0·0	...	...
GORE FARM HOSPITAL.																		
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10...	11	1	...	...	...	12	12	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15...	10	...	...	...	...	10	10	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	23	1	...	...	...	24	24	...	...	...	...	...	...	...	...	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	...	..

TABLE XXVA.—Showing the site of the affection in those cases in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1895.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
FOUNTAIN HOSPITAL.																		
Under 1...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	2	...	...	...	...	2	2	...	2	...	...	...	...	2	2	...	100·0	0·0
2 ,, 3...	1	1	1	...	...	3	2	1	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4...	1	...	2	...	...	3	1	2	1	...	1	...	...	2	1	1	100·0	50·0
4 ,, 5...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10...	9	...	...	...	...	9	9	...	1	...	...	...	...	1	1	...	11·1	0·0
10 ,, 15...	3	...	1	...	...	4	3	1	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	22	1	4	...	...	27	23	4	4	...	1	...	...	5	4	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	18·1	0·0	25·0	0·0	0·0	18·5	17·3	25·0	...	...
WESTERN HOSPITAL.																		
Under 1...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	5	2	2	...	...	9	7	2	2	...	...	...	...	2	2	...	28·5	0·0
2 ,, 3...	8	3	...	1	...	12	11	1	...	1	...	...	...	1	1	...	9·09	0·0
3 ,, 4...	3	2	2	...	...	7	5	2	1	2	...	...	...	3	3	...	60·0	0·0
4 ,, 5...	1	1	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10...	22	...	...	...	...	22	22	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15...	7	...	...	...	...	7	7	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	10	...	...	...	...	10	10	...	1	...	...	...	...	1	1	...	10·0	0·0
Total	60	8	4	1	...	73	68	5	4	3	...	...	...	7	7	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	6·6	37·5	0·0	0·0	0·0	9·5	10·2	0·0	...	...
EASTERN HOSPITAL.																		
Under 1..	2	1	...	...	...	3	3	...	2	1	...	...	...	3	3	...	100·0	0·0
1 to 2...	2	2	2	1	...	7	4	3	1	2	2	1	...	6	3	3	75·0	100·0
2 ,, 3...	7	1	...	...	...	8	8	...	1	1	...	...	...	2	2	...	25·0	0·0
3 ,, 4...	2	2	2	...	...	6	4	2	...	...	1	...	...	1	...	1	0·0	50·0
4 ,, 5...	3	3	...	...	...	6	6	...	...	2	...	...	...	2	2	...	33·3	0·0
5 ,, 10...	13	4	2	...	...	19	17	2	2	1	...	...	...	3	3	...	17·6	0·0
10 ,, 15...	7	3	1	...	...	11	10	1	1	1	...	...	...	2	2	...	20·0	0·0
15 ,, 20...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	37	16	7	1	...	61	53	8	7	8	3	1	...	19	15	4	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	18·9	50·0	42·8	100·0	0·0	31·1	28·3	50·0	...	...
SOUTH-EASTERN HOSPITAL.																		
Under 1...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	2	1	1	...	...	4	3	1	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3...	2	1	1	...	...	4	3	1	...	1	...	...	...	1	1	...	33·3	0·0
3 ,, 4...	7	4	...	...	...	11	11	...	1	...	...	...	...	1	1	...	9·09	0·0
4 ,, 5...	4	2	1	...	...	7	6	1	...	1	...	...	...	1	1	...	16·6	0·0
5 ,, 10...	19	3	3	...	...	25	22	3	...	...	1	...	...	1	...	1	0·0	33·3
10 ,, 15...	16	1	...	...	...	17	17	...	2	...	...	...	...	2	2	...	11·7	0·0
15 ,, 20...	8	...	...	...	...	8	8	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	12	...	...	...	...	12	12	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	71	12	6	...	...	89	83	6	3	2	1	...	...	6	5	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	4·2	16·6	16·6	0·0	0·0	6·7	6·02	16·6	...	...
SOUTH-WESTERN HOSPITAL.																		
Under 1...	1	2	...	1	...	4	3	1	1	1	...	1	...	3	2	1	66·6	100·0
1 to 2...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3...	...	2	1	...	...	3	2	1	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4...	5	3	1	...	...	9	8	1	1	2	1	...	...	4	3	1	37·5	100·0
4 ,, 5...	1	2	1	...	...	4	3	1	1	...	...	...	...	1	1	...	33·3	0·0
5 ,, 10...	6	4	3	...	...	13	10	3	1	1	1	...	...	3	2	1	20·0	33·3
10 ,, 15...	2	3	...	...	...	5	5	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	15	17	6	1	...	39	32	7	4	4	2	1	...	11	8	3	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	26·6	23·5	33·3	100·0	0·0	28·2	25·0	42·8	...	...

TABLE XXVA. (*continued*).—Showing the site of the affection in those cases in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1895.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Nasal, and Laryngeal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Nasal, and Laryngeal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
NORTH-WESTERN HOSPITAL.																		
Under 1...	1	...	...	...	...	1	1	...	1	...	...	...	...	1	1	...	100·0	0·0
1 to 2...	4	2	1	...	...	7	6	1	2	2	1	...	...	5	4	1	66·6	100·0
2 ,, 3...	2	...	1	...	...	3	2	1	1	...	...	...	...	1	1	...	50·0	0·0
3 ,, 4...	3	3	2	...	...	8	6	2	1	1	1	...	...	3	2	1	33·3	50·0
4 ,, 5...	1	1	...	...	...	2	2	...	1	...	...	...	...	1	1	...	50·0	0·0
5 ,, 10...	4	1	...	1	...	6	5	1	...	1	...	...	...	1	1	...	20·0	0·0
10 ,, 15...	4	...	...	...	...	4	4	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	9	...	1	...	...	10	9	1	...	...	1	...	...	1	...	1	0·0	100·0
Total	29	7	5	1	...	42	36	6	6	4	3	...	...	13	10	3	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	20·6	57·1	60·0	0·0	0·0	30·9	27·7	50·0	...	...
NORTHERN HOSPITAL.																		
Under 1...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	0·0	0·0
1 to 2...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10...	1	1	1	...	...	3	2	1	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0.0	0·0
15 ,, 20...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	2	1	1	...	...	4	3	1	...	...	...	...	...	...	...	...	0·0	0·0
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	...	...

TABLE XXVA. (*continued*).—Showing the site of the affection in those cases in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1896.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
FOUNTAIN HOSPITAL.																		
Under 1	...	...	1	...	...	1	...	1	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	2	3	2	..	...	7	5	2	...	2	1	...	...	3	2	1	40·0	50·0
2 ,, 3	5	2	2	1	...	10	7	3	2	...	...	...	...	2	2	...	28·5	0·0
3 ,, 4	6	3	1	1	...	11	9	2	3	3	...	1	...	7	6	1	66·6	50·0
4 ,, 5	9	3	...	...	...	12	12	...	3	2	...	...	...	5	5	...	41·6	0·0
5 ,, 10	18	8	4	1	...	31	26	5	3	2	...	1	...	6	5	1	19·2	20·0
10 ,, 15	5	...	...	...	...	5	5	...	1	...	...	...	...	1	1	...	20·0	0·0
15 ,, 20	2	1	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	7	...	...	...	...	7	7	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	54	20	10	3	...	87	74	13	12	9	1	2	...	24	21	3	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	22·2	45·0	10·0	66·6	0·0	27·5	28·3	23·07	...	...
WESTERN HOSPITAL.																		
Under 1	...	1	1	...	...	2	1	1	...	...	1	...	...	1	...	1	0·0	100·0
1 to 2	1	4	...	...	...	5	5	...	1	1	...	...	...	2	2	...	40·0	0·0
2 ,, 3	5	2	2	2	...	11	7	4	2	1	...	...	...	3	3	...	42·8	0·0
3 ,, 4	1	3	2	...	...	6	4	2	...	...	1	...	...	1	...	1	0·0	50·0
4 ,, 5	3	4	...	1	...	8	7	1	...	2	...	...	...	2	2	...	28·5	0·0
5 ,, 10	18	4	1	...	...	23	22	1	2	1	1	...	...	4	3	1	13·6	100·0
10 ,, 15	8	...	...	...	...	8	8	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	4	1	...	...	...	5	5	...	1	...	...	...	...	1	1	...	20·0	0·0
Total	40	20	6	3	...	69	60	9	6	5	3	...	...	14	11	3	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	15·0	25·0	50·0	0·0	0·0	20·2	18·3	33·3	...	...
EASTERN HOSPITAL.																		
Under 1	...	1	1	...	...	2	1	1	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	3	1	2	...	...	6	4	2	...	1	1	...	...	2	1	1	25·0	50·0
2 ,, 3	3	4	1	1	...	9	7	2	...	2	...	...	...	2	2	...	28·5	0·0
3 ,, 4	3	...	4	1	...	8	3	5	1	...	...	1	...	2	1	1	33·3	20·0
4 ,, 5	...	2	3	...	...	5	2	3	...	1	1	...	...	2	1	1	50·0	33·3
5 ,, 10	9	3	2	1	...	15	12	3	1	...	1	...	...	2	1	1	8·3	33·3
10 ,, 15	5	1	...	...	...	6	6	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	27	12	13	3	...	55	39	16	2	4	3	1	...	10	6	4	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	7·4	33·3	23·07	33·3	0·0	18·1	15·3	25·0	...	...
SOUTH-EASTERN HOSPITAL.																		
Under 1	1	1	...	1	...	3	2	1	1	...	...	1	...	2	1	1	50·0	100·0
1 to 2	7	2	...	...	...	9	9	...	1	1	...	...	...	2	2	...	22·2	0·0
2 ,, 3	5	4	...	...	...	9	9	...	1	2	...	...	...	3	3	...	33·3	0·0
3 ,, 4	5	2	3	...	...	10	7	3	1	2	2	...	...	5	3	2	42·8	66·6
4 ,, 5	7	2	5	...	...	14	9	5	...	1	1	...	..	2	1	1	11·1	20·0
5 ,, 10	14	3	2	...	...	19	17	2	2	...	...	...	...	2	2	...	11·7	0·0
10 ,, 15	9	3	...	...	...	12	12	...	1	1	...	...	...	2	2	...	16·6	0·0
15 ,, 20	3	1	...	...	...	4	4	...	1	1	...	...	...	2	2	...	50·0	0·0
20 and upwards ...	4	...	...	...	...	4	4	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	55	18	10	1	...	84	73	11	8	8	3	1	...	20	16	4	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	14·5	44·4	30·0	100·0	0·0	23·8	21·9	36·3	...	...
SOUTH-WESTERN HOSPITAL.																		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	1	1	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	1	2	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	1	1	...	...	...	2	2	...	...	1	...	...	...	1	1	...	50·0	0·0
4 ,, 5	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	1	2	...	...	...	3	3	...	...	1	...	...	...	1	1	...	33·3	0·0
10 ,, 15	3	2	...	...	...	5	5	...	...	1	...	...	...	1	1	...	20·0	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	3	...	...	...	3	3	...	...	1	...	...	...	1	1	...	33·3	0·0
Total	7	12	...	...	...	19	19	...	...	4	...	...	...	4	4	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	33·3	0·0	0·0	0·0	21·05	21·05	0·0	...	...

TABLE XXVA. (*continued*).—Showing the site of the affection in those cases in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1896.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent.	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
NORTH-WESTERN HOSPITAL.																		
Under 1	1	...	2	...	...	3	1	2	...	...	1	...	...	1	...	1	0·0	50·0
1 to 2	2	2	...	...	...	4	4	...	2	2	...	...	...	4	4	...	100·0	0·0
2 ,, 3	5	...	...	...	...	5	5	...	4	...	...	...	...	4	4	...	80·0	0·0
3 ,, 4	4	...	...	...	...	4	4	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	5	1	...	...	...	6	6	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	7	2	1	1	...	11	9	2	1	1	...	...	...	2	2	...	22·2	0·0
10 ,, 15	5	2	...	...	...	7	7	...	1	...	...	...	...	1	1	...	14·2	0·0
15 ,, 20	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	31	7	3	1	...	42	38	4	8	3	1	...	...	12	11	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	25·8	42·8	33·3	0·0	0·0	28·5	28·9	25·0	...	...
NORTH-EASTERN HOSPITAL.																		
Under 1	...	...	1	...	...	1	...	1	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	1	...	...	1	...	1	...	...	1	...	...	1	...	1	0·0	100·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	2	2	...	...	...	4	4	...	...	1	...	...	...	1	1	...	25·0	0·0
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	2	2	2	...	...	6	4	2	...	1	1	...	...	2	1	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	50·0	50·0	0·0	0·0	33·3	25·0	50·0	...	...
BROOK HOSPITAL.																		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	3	...	...	...	...	3	3	...	1	...	...	...	...	1	1	...	33·3	0·0
4 ,, 5	1	1	1	...	...	3	2	1	...	1	...	...	...	1	1	...	50·0	0·0
5 ,, 10	4	1	...	...	...	5	5	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15	2	1	...	...	...	3	3	...	...	1	...	...	...	1	1	...	33·3	0·0
15 ,, 20	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	12	3	1	1	...	17	15	2	1	2	...	...	...	3	3	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	8·3	66·6	0·0	0·0	0·0	17·6	20·0	0·0	...	...
NORTHERN HOSPITAL.																		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	2	...	...	...	1	3	2	1	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	10	1	...	...	...	11	11	...	...	1	...	...	...	1	1	...	9·09	0·0
10 ,, 15	4	1	...	...	...	5	5	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	24	2	...	...	1	27	26	1	...	1	...	...	...	1	1	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	50·0	0·0	0·0	0·0	3·7	3·8	0·0	...	...
GORE FARM HOSPITAL.																		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	5	...	...	...	...	5	5	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	11	...	...	...	...	11	11	...	...	...	...	...	...	...	...	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	...	...

TABLE XXVIA.—Showing the site of the affection in those cases in which no Diphtheria bacilli were found and no Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1895.

FOUNTAIN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1...	1	...	1	...	...	2	1	1	1	...	...	...	...	1	1	...	100·0	0·0
1 to 2...	4	2	1	1	...	8	6	2	1	...	...	1	...	2	1	1	16·6	50·0
2 „ 3...	10	1	...	1	...	12	11	1	3	...	...	...	...	3	3	...	27·2	0·0
3 „ 4...	8	1	2	...	...	11	9	2	1	1	...	...	...	2	2	...	22·2	0·0
4 „ 5...	20	2	1	...	...	23	22	1	2	...	...	...	...	2	2	...	9·09	0·0
5 „ 10...	57	7	...	...	...	64	64	...	4	1	...	...	...	5	5	...	7·8	0·0
10 „ 15...	41	1	...	...	...	42	42	...	...	...	...	...	...	...	...	...	0·0	0·0
15 „ 20...	16	1	...	...	...	17	17	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards	36	...	1	...	...	37	36	1	...	...	1	...	...	1	...	1	0·0	100·0
Total	193	15	6	2	...	216	208	8	12	2	1	1	...	16	14	2	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	6·2	13·3	16·6	50·0	0·0	7·4	6·7	25·0	...	...

WESTERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2...	4	...	...	...	...	4	4	...	1	...	...	...	...	1	1	...	25·0	0·0
2 „ 3...	4	1	...	...	...	5	5	...	1	...	...	...	...	1	1	...	20·0	0·0
3 „ 4...	9	2	...	...	...	11	11	...	2	1	...	...	...	3	3	...	27·2	0·0
4 „ 5...	8	1	...	...	...	9	9	...	2	...	...	...	...	2	2	...	22·2	0·0
5 „ 10...	35	2	...	...	...	37	37	...	3	...	...	...	...	3	3	...	8·1	0·0
10 „ 15...	29	1	...	...	...	30	30	...	...	...	...	...	...	...	...	...	0·0	0·0
15 „ 20...	15	...	...	...	...	15	15	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	50	1	...	...	...	51	51	...	2	...	...	...	...	2	2	...	3·9	0·0
Total	156	8	...	...	...	164	164	...	11	1	...	...	...	12	12	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	7·05	12·5	0·0	0·0	0·0	7·3	7·3	0·0	...	...

EASTERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1...	1	2	1	1	...	5	3	2	1	2	...	1	...	4	3	1	100·0	50·0
1 to 2...	6	2	2	...	...	10	8	2	2	1	1	...	...	4	3	1	37·5	50·0
2 „ 3...	8	5	...	...	...	13	13	...	2	1	...	...	...	3	3	...	23·07	0·0
3 „ 4...	10	7	...	...	...	17	17	...	1	2	...	...	...	3	3	...	17·6	0·0
4 „ 5...	8	3	...	1	...	12	11	1	2	...	...	...	...	2	2	...	18·1	0·0
5 „ 10...	56	15	2	...	...	73	71	2	4	...	...	...	...	4	4	...	5·6	0·0
10 „ 15...	48	3	...	...	...	51	51	...	...	...	...	...	...	...	...	...	0·0	0·0
15 „ 20...	34	...	...	...	...	34	34	...	2	...	...	...	...	2	2	...	5·8	0·0
20 and upwards ...	46	...	...	...	...	46	46	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	217	37	5	2	...	261	254	7	14	6	1	1	...	22	20	2	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	6·4	16·2	20·0	50·0	0·0	8·4	7·8	28·5	...	...

SOUTH-EASTERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1...	1	...	...	...	...	1	1	...	1	...	...	...	...	1	1	...	100·0	0·0
1 to 2...	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
2 „ 3...	2	2	...	1	...	5	4	1	1	...	...	1	...	2	1	1	25·0	100·0
3 „ 4...	7	6	...	...	...	13	13	...	1	4	...	...	...	5	5	...	38·4	0·0
4 „ 5...	6	4	...	...	...	10	10	...	...	2	...	..	...	2	2	...	20·0	0·0
5 „ 10...	30	5	1	...	...	36	35	1	3	...	...	...	...	3	3	...	8·5	0·0
10 „ 15...	23	1	...	...	...	24	24	...	2	...	...	...	...	2	2	...	8·3	0·0
15 „ 20...	14	...	...	...	...	14	14	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	25	...	...	...	...	25	25	...	...	...	...	...	...	...	...	...	0·0	0 0
Total	111	18	1	1	...	131	129	2	8	6	...	1	...	15	14	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	7·2	33·3	0·0	100·0	0·0	11·4	10·8	50·0	...	...

SOUTH-WESTERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	1	...	...	..	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	1	...	...	1	...	1	...	...	...	...	...	...	...	...	0·0	0·0
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 „ 4	5	1	...	...	...	6	6	...	...	...	...	...	...	...	...	...	0·0	0·0
4 „ 5	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
5 „ 10	18	3	...	...	...	21	21	...	1	...	...	...	...	1	1	...	4·7	0·0
10 „ 15	11	2	...	...	...	13	13	...	...	...	...	...	...	...	...	...	0·0	0·0
15 „ 20	11	...	...	...	...	11	11	...	1	...	...	...	...	1	1	...	9·09	0·0
20 and upwards ...	21	...	...	...	...	21	21	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	69	6	1	...	...	76	75	1	2	...	...	...	...	2	2	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	2·8	0·0	0·0	0·0	0 0	2·6	2·6	0·0	...	...

TABLE XXVIa. (*continued*).—Showing the site of the affection in those cases in which no Diphtheria bacilli were found and no Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1895.

NORTH-WESTERN HOSPITAL.

Ages.	Cases.						Total Cases.		Deaths.						Total Deaths.		Mortality per cent	
	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Faucial and Nasal.	Faucial and Laryngeal.	Faucial, Laryngeal, and Nasal.	Laryngeal.	Total.	Faucial.	Laryngeal.	Faucial.	Laryngeal.
Under 1	2	1	1	...	...	4	3	1	1	1	1	...	...	3	2	1	66·6	100·0
1 to 2	4	2	...	...	...	6	6	...	1	1	...	...	...	2	2	...	33·3	0·0
2 „ 3	8	...	2	1	...	11	8	3	4	...	1	...	...	5	4	1	50·0	33·3
3 „ 4	11	...	1	...	...	12	11	1	2	...	...	...	...	2	2	...	18·1	0·0
4 „ 5	9	1	...	...	...	10	10	...	3	...	...	...	...	3	3	...	30·0	0·0
5 „ 10	31	2	...	...	...	33	33	...	4	1	...	...	...	5	5	...	15·1	0·0
10 „ 15	18	2	...	...	...	20	20	...	2	...	...	...	...	2	2	...	10·0	0·0
15 „ 20	11	...	...	...	...	11	11	...	1	...	...	...	...	1	1	...	9·09	0·0
20 and upwards ...	21	2	1	...	...	24	23	1	1	...	...	...	...	1	1	...	4·3	0·0
Total	115	10	5	1	...	131	125	6	19	3	2	...	...	24	22	2	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	16·5	30·0	40·0	0·0	0·0	18·3	17·6	33·3	...	...

NORTH-EASTERN HOSPITAL.

Ages.	Cases: Faucial.	Cases: Faucial and Nasal.	Cases: Faucial and Laryngeal.	Cases: Faucial, Laryngeal, and Nasal.	Cases: Laryngeal.	Cases: Total.	Total Cases: Faucial.	Total Cases: Laryngeal.	Deaths: Faucial.	Deaths: Faucial and Nasal.	Deaths: Faucial and Laryngeal.	Deaths: Faucial, Laryngeal, and Nasal.	Deaths: Laryngeal.	Deaths: Total.	Total Deaths: Faucial.	Total Deaths: Laryngeal.	Mortality per cent: Faucial.	Mortality per cent: Laryngeal.
Under 1	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	4	1	1	...	...	6	5	1	...	...	...	...	...	...	...	...	0·0	0·0
2 „ 3	6	1	...	...	...	7	7	...	1	...	...	...	...	1	1	...	14·2	0·0
3 „ 4	11	...	...	...	...	11	11	...	...	...	...	...	...	...	...	...	0·0	0·0
4 „ 5	14	1	...	...	...	15	15	...	3	1	...	...	...	4	4	...	26·6	0·0
5 „ 10	28	4	...	...	...	32	32	...	3	1	...	...	...	4	4	...	12·5	0·0
10 „ 15	14	2	...	...	...	16	16	...	...	...	...	...	...	...	...	...	0·0	0·0
15 „ 20	5	1	...	...	...	6	6	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	4	...	...	...	...	4	4	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	88	10	1	...	...	99	98	1	7	2	...	...	...	9	9	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	7·9	20·0	0·0	0·0	0·0	9·09	9·1	0·0	...	...

NORTHERN HOSPITAL.

Ages.	Cases: Faucial.	Cases: Faucial and Nasal.	Cases: Faucial and Laryngeal.	Cases: Faucial, Laryngeal, and Nasal.	Cases: Laryngeal.	Cases: Total.	Total Cases: Faucial.	Total Cases: Laryngeal.	Deaths: Faucial.	Deaths: Faucial and Nasal.	Deaths: Faucial and Laryngeal.	Deaths: Faucial, Laryngeal, and Nasal.	Deaths: Laryngeal.	Deaths: Total.	Total Deaths: Faucial.	Total Deaths: Laryngeal.	Mortality per cent: Faucial.	Mortality per cent: Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 „ 4	6	...	1	...	...	7	6	1	...	...	...	...	...	...	...	...	...	...
4 „ 5	6	...	...	...	...	6	6	...	...	...	...	...	...	...	...	...	...	...
5 „ 10 ...	32	...	...	...	...	32	32	...	...	...	...	...	...	...	...	...	...	...
10 „ 15	7	...	...	...	...	7	7	...	...	...	...	...	..	...	...	...	...	...
15 „ 20	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
20 and upwards ...	5	...	..	...	...	5	5	...	...	...	...	...	...	...	...	...	...	...
Total	57	...	1	...	...	58	57	1	...	...	...	...	...	...	...	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0	...	..

TABLE XXVIA. (*continued*).—Showing the site of the affection in those cases in which no Diphtheria bacilli were found and no Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1896.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
FOUNTAIN HOSPITAL.																		
Under 1	3	1	...	...	...	4	4	...	2	1	...	...	...	3	3	...	75·0	0·0
1 to 2	5	2	...	...	...	7	7	...	...	1	...	...	...	1	1	...	14·2	0·0
2 ,, 3	12	2	...	...	...	14	14	...	2	1	...	...	...	3	3	...	21·4	0·0
3 ,, 4	13	3	1	...	...	17	16	1	1	1	...	...	...	2	2	...	12·5	0·0
4 ,, 5	15	3	2	...	...	20	18	2	1	1	...	...	...	2	2	...	11·1	0·0
5 ,, 10	75	9	...	...	...	84	84	...	2	...	...	...	...	2	2	...	2·3	0·0
10 ,, 15	54	1	...	...	...	55	55	...	1	...	...	...	...	1	1	...	1·8	0·0
15 ,, 20	32	...	...	...	...	32	32	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	36	1	...	...	...	37	37	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	245	22	3	...	...	270	267	3	9	5	...	...	...	14	14	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	3·6	22·7	0·0	0·0	0·0	5·1	5·2	0·0	...	...
WESTERN HOSPITAL.																		
Under 1	2	1	...	...	...	3	3	...	1	1	...	...	...	2	2	...	66·6	0·0
1 to 2	2	3	...	...	...	5	5	...	...	1	...	...	...	1	1	...	20·0	0·0
2 ,, 3	9	1	...	1	...	11	10	1	3	...	...	1	...	4	3	1	30·0	100·0
3 ,, 4	12	2	...	...	...	14	14	...	...	1	...	...	...	1	1	...	7·1	0·0
4 ,, 5	15	3	...	...	...	18	18	...	1	...	...	...	...	1	1	...	5·5	0·0
5 ,, 10	45	7	...	...	...	52	52	...	4	1	...	...	...	5	5	...	9·6	0·0
10 ,, 15	36	1	...	...	...	37	37	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	25	...	...	...	...	25	25	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	50	3	...	...	...	53	53	...	2	...	...	...	...	2	2	...	3·7	0·0
Total	196	21	...	1	...	218	217	1	11	4	...	1	...	16	15	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	5·6	19·09	0·0	100·0	0·0	7·3	6·9	100·0	...	...
EASTERN HOSPITAL.																		
Under 1	1	...	...	...	...	1	1	...	1	...	...	...	...	1	1	...	100·0	0·0
1 to 2	5	3	...	...	...	8	8	...	2	...	...	...	...	2	2	...	25·0	0·0
2 ,, 3	6	8	...	...	...	14	14	...	1	3	...	...	...	4	4	...	28·5	0·0
3 ,, 4	24	5	...	1	...	30	29	1	2	3	...	...	...	5	5	...	17·2	0·0
4 ,, 5	22	4	...	1	...	27	26	1	2	2	...	1	...	5	4	1	15·3	100·0
5 ,, 10	62	11	...	...	...	73	73	...	4	1	...	...	...	5	5	...	6·8	0·0
10 ,, 15	46	3	...	...	...	49	49	...	1	1	...	...	...	2	2	...	4·08	0·0
15 ,, 20	26	...	...	...	...	26	26	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	40	1	...	...	...	41	41	...	1	...	...	...	...	1	1	...	2·4	0·0
Total	232	35	...	2	...	269	267	2	14	10	...	1	...	25	24	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	6·03	28·5	0·0	50·0	0·0	9·3	8·9	50·0	...	...
SOUTH-EASTERN HOSPITAL.																		
Under 1	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	6	4	...	...	...	10	10	...	1	2	...	...	...	3	3	...	30·0	0·0
2 ,, 3	6	3	...	...	...	9	9	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	9	2	...	...	...	11	11	...	2	...	...	...	...	2	2	...	18·1	0·0
4 ,, 5	10	4	1	...	...	15	14	1	1	1	1	...	...	3	2	1	14·2	100·0
5 ,, 10	44	6	1	...	...	51	50	1	1	1	...	...	...	2	2	...	4·0	0·0
10 ,, 15	28	...	...	1	...	29	28	1	2	...	...	...	...	2	2	...	7·1	0·0
15 ,, 20	26	1	...	...	...	27	27	...	1	...	...	...	...	1	1	...	3·7	0·0
20 and upwards ...	34	1	...	...	...	35	35	...	...	1	...	...	...	1	1	...	2·8	0·0
Total	166	21	2	1	...	190	187	3	8	5	1	...	...	14	13	1	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	4·8	23·8	50·0	0·0	0·0	7·3	6·9	33·3	...	...
SOUTH-WESTERN HOSPITAL.																		
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	2	1	3	1	...	7	3	4	1	1	1	1	...	4	2	2	66·6	50·0
3 ,, 4	5	1	...	...	...	6	6	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	2	1	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	19	2	...	...	...	21	21	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15	24	1	...	...	...	25	25	...	1	...	...	...	...	1	1	...	4·0	0·0
15 ,, 20	21	...	...	...	...	21	21	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	29	1	...	...	...	30	30	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	104	7	3	1	...	115	111	4	2	1	1	1	...	5	3	2	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	1·9	14·2	33·3	100·0	0·0	4·3	2·7	50·0	...	...

TABLE XXVIA. (*continued*).—Showing the site of the affection in those cases in which no Diphtheria bacilli were found and no Antitoxic Serum was injected. The total deaths and percentage mortality, at different ages, amongst these sets of cases are also shown.

1896.

NORTH-WESTERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	2	1	...	...	...	3	3	...	1	1	...	...	...	2	2	...	66·6	0.0
1 to 2	3	2	1	...	...	6	5	1	2	1	1	...	...	4	3	1	60·0	100·0
2 ,, 3	6	2	...	...	...	8	8	...	3	...	...	...	...	3	3	...	37·5	0·0
3 ,, 4	10	3	1	...	...	14	13	1	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	12	4	3	2	...	21	16	5	1	3	...	1	...	5	4	1	25·0	20.0
5 ,, 10	35	2	...	...	...	37	37	...	4	...	...	...	...	4	4	...	10·8	0·0
10 ,, 15	13	3	...	...	...	16	16	...	1	...	...	...	...	1	1	...	6·2	0·0
15 ,, 20	9	...	...	...	...	9	9	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	28	1	...	...	...	29	29	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	118	18	5	2	...	143	136	7	12	5	1	1	...	19	17	2	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	10·1	27·7	20·0	50·0	0·0	13·2	12·5	28·5	...	...

NORTH-EASTERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	2	...	...	...	...	2	2	...	1	...	...	...	...	1	1	...	50·0	0·0
2 ,, 3	...	2	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	5	2	...	...	...	7	7	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	7	2	...	...	...	9	9	...	1	...	...	...	...	1	1	...	11·1	0·0
5 ,, 10	12	4	...	...	...	16	16	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15	13	1	...	...	...	14	14	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	44	11	...	...	...	55	55	..	2	...	...	...	...	2	2	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	4·5	0·0	0·0	0·0	0·0	3·6	3·6	0·0	...	...

BROOK HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	2	...	...	...	...	2	2	...	1	...	...	...	...	1	1	...	50·0	0·0
3 ,, 4	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	2	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	9	1	...	1	...	11	10	1	...	1	...	...	...	1	1	...	10·0	0·0
10 ,, 15	5	...	...	...	...	5	5	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	8	...	...	...	...	8	8	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	6	1	...	...	...	7	7	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	34	2	...	1	...	37	36	1	1	1	...	...	...	2	2	...	...	..
Mortality per cent.	...	...	...	...	...	...	...	...	2·9	50·0	0·0	0·0	0·0	5·4	5·5	0·0	...	...

NORTHERN HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	5	...	...	...	...	5	5	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	16	...	...	...	...	16	16	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15	8	...	...	...	...	8	8	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	6	...	...	...	...	6	6	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	3	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	41	...	...	...	...	41	41	...	...	...	...	...	...	...	...	...	...	...
Mortality per cent.	...	...	..	...	...	...	...	...	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	...	...

GORE FARM HOSPITAL.

Ages.	Cases. Faucial.	Cases. Faucial and Nasal.	Cases. Faucial and Laryngeal.	Cases. Faucial, Laryngeal, and Nasal.	Cases. Laryngeal.	Cases. Total.	Total Cases. Faucial.	Total Cases. Laryngeal.	Deaths. Faucial.	Deaths. Faucial and Nasal.	Deaths. Faucial and Laryngeal.	Deaths. Faucial, Laryngeal, and Nasal.	Deaths. Laryngeal.	Deaths. Total.	Total Deaths. Faucial.	Total Deaths. Laryngeal.	Mortality per cent. Faucial.	Mortality per cent. Laryngeal.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
3 ,, 4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
4 ,, 5	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	0·0	0·0
5 ,, 10	7	1	...	...	...	8	8	...	...	...	...	...	...	...	...	...	0·0	0·0
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·0
Total	8	1	...	...	...	9	9	...	...	...	...	...	...	...	...	...	...	...
Mortality per cent.	...	...	...	...	...	...	...	...	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	...	...

TABLE XXVIIA.—Percentage Mortality, at different ages, of cases in which Diphtheria bacilli were found, in which Tracheotomy was performed and Antitoxic Serum was injected.

1895.

Ages.	Fountain.			Western.			Eastern.			South-Eastern.			South-Western.			North-Western.			North-Eastern.			Brook.*			Northern.			Gore Farm.*		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	...	...	0·0	1	1	100·0	1	1	100·0	1	0	0,0	1	1	100·0	...	...	0·0	...	...	...	...	...	...	...	...	0·0	...	...	...
1 to 2	8	5	62·5	5	2	40·0	8	6	75·0	8	6	75·0	3	2	66·6	7	5	71·4	...	...	...	...	...	...	...	...	0·0	...	...	...
2 ,, 3	3	1	33·3	5	2	40·0	7	4	57·1	9	3	33·3	2	1	50·0	1	1	100·0	...	...	...	...	...	...	...	...	0·0	...	...	...
3 ,, 4	7	3	42·8	5	4	80·0	9	5	55·5	7	4	57·1	5	1	20·0	5	1	20·0	...	...	...	...	...	...	...	...	0·0	...	...	...
4 ,, 5	5	2	40·0	6	2	33·3	6	2	33·3	11	4	36·3	5	4	80·0	3	1	33.3	...	...	...	...	...	...	1	1	100·0	...	...	...
5 ,, 10	4	1	25·0	7	4	57·1	8	3	37·5	15	3	20·0	8	2	25·0	2	...	0·0	...	...	...	...	...	...	...	...	0·0	...	...	...
10 ,, 15	...	...	0·0	...	...	0·0	1	1	100·0	...	...	0·0	1	1	100·0	...	...	0·0	...	...	...	...	...	...	...	...	0·0	...	...	...
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	...	...	...	...	...	...	0·0	...	...	...
20 and upwards...	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	...	...	...	...	...	...	0·0	...	...	...
Total	27	12	...	29	15	...	40	22	...	51	20	...	25	12	...	18	8	...	...	...	...	...	...	...	1	1	...	...	...	...
Mortality per cent.	...	...	44·4	...	...	51·7	...	...	55·0	...	...	39·2	...	...	48·0	...	...	44·4	...	...	...	...	...	...	...	...	100·0	...	...	...

* Hospitals not opened until 1896.

1896.

Ages.	Fountain.			Western.			Eastern.			South-Eastern.			South-Western.			North-Western.			North-Eastern.			Brook.*			Northern.			Gore Farm.*		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	...	...	0·0	2	1	50·0	...	...	0·0	1	1	100·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2	2	0	0·0	7	7	100·0	4	0	0·0	10	6	60·0	3	3	100·0	1	1	100·0	1	1	100·0	3	2	66·6	...	...	0·0	...	...	0·0
2 ,, 3	6	2	33·3	13	8	44·4	4	2	50·0	9	4	44·4	5	2	40·0	2	1	50·0	1	1	100·0	1	1	100·0	...	...	0·0	...	...	0·0
3 ,, 4	4	2	50·0	4	1	50·0	6	2	33·3	18	2	11·1	2	2	100·0	4	2	50·0	...	...	0·0	2	1	50·0	1	0	0·0	1	0	0·0
4 ,, 5	7	3	42·8	7	5	71·4	5	3	60·0	11	1	9·09	5	2	40·0	3	3	100·0	1	1	100·0	1	0	0·0	...	...	0·0	...	...	0·0
5 ,, 10	8	2	25·0	17	8	47·05	12	1	8·3	8	3	37·5	10	3	30·0	7	2	28·5	...	...	0·0	3	0	0·0	...	...	0·0	...	...	0·0
10 ,, 15	...	...	0.0	...	...	0·0	...	...	0·0	3	1	33·3	...	...	0·0	1	1	100·0	1	1	100·0	1	0	0·0	...	...	0·0	...	...	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards...	...	...	0 0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
Total	27	9	...	50	30	...	31	8	...	60	18	...	25	12	...	18	10	...	4	4	...	11	4	...	1	0	...	1	0	...
Mortality per cent.	...	...	33·3	...	...	60·0	...	...	25·8	...	...	30·0	...	...	48·0	...	...	55·5	...	...	100·0	...	...	36·3	...	...	0·0	...	...	0·0

Table XXVIIIa.—Percentage Mortality, at different ages, of cases in which Diphtheria bacilli were found, in which Tracheotomy was performed, but no Antitoxic Serum was injected.

1895.

Ages.	Fountain. Cases.	Fountain. Deaths.	Fountain. Mortality per cent.	Western. Cases.	Western. Deaths.	Western. Mortality per cent.	Eastern. Cases.	Eastern. Deaths.	Eastern. Mortality per cent.	South-Eastern. Cases.	South-Eastern. Deaths.	South-Eastern. Mortality per cent.	South-Western. Cases.	South-Western. Deaths.	South-Western. Mortality per cent.	North-Western. Cases.	North-Western. Deaths.	North-Western. Mortality per cent.	North-Eastern. Cases.	North-Eastern. Deaths.	North-Eastern. Mortality per cent.
Under 1	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2	1	1	100·0	1	0	0·0	3	2	66·6	1	1	100·0	...	...	0·0	4	3	75·0	1	1	100·0
2 ,, 3	1	1	100·0	1	0	0·0	3	1	33·3	1	1	100·0	1	1	100·0	2	1	50·0	3	3	100·0
3 ,, 4	1	1	100·0	...	...	0·0	1	1	100·0	...	...	0·0	1	0	0·0	4	2	50·0	2	1	50·0
4 ,, 5	...	...	0·0	...	...	0·0	1	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0	...	...	0·0
5 ,, 10	2	0	0·0	3	0	0·0	7	5	71·4	...	...	0·0	...	...	0·0	2	2	100·0	...	...	0·0
10 ,, 15	...	...	0·0	...	...	0·0	1	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	1	0	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
Total	5	3	...	5	0	...	16	9	...	2	2	...	2	1	...	13	9	...	7	5	...
Mortality per cent.	...	...	60·0	...	...	0·0	...	...	56·2	...	...	100·0	...	...	50·0	...	...	69·2	...	...	71·4

1896.

Ages.	Fountain. Cases.	Fountain. Deaths.	Fountain. Mortality per cent.	South-Eastern. Cases.	South-Eastern. Deaths.	South-Eastern. Mortality per cent.	North-Western. Cases.	North-Western. Deaths.	North-Western. Mortality per cent.
Under 1	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2	1	1	100·0	...	...	0·0	2	2	100·0
2 ,, 3	...	...	0·0	...	...	0·0	3	0	0·0
3 ,, 4	1	1	100·0	1	1	100·0	3	1	33·3
4 ,, 5	...	...	0·0	...	...	0·0	3	1	33·3
5 ,, 10	1	0	0·0	...	...	0·0	3	2	66·6
10 ,, 15	...	...	0·0	...	...	0·0	...	...	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards	...	...	0·0	...	...	0·0	...	...	0·0
Total	3	2	...	1	1	...	14	6	...
Mortality per cent.	...	...	66·6	...	...	100·0	...	...	42·8

TABLE XXIXA.—Percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found, but in which Tracheotomy was performed and Antitoxic Serum was injected.

1895.

Ages.	WESTERN. Cases.	Deaths.	Mortality per cent.	EASTERN. Cases.	Deaths.	Mortality per cent.	SOUTH-EASTERN. Cases.	Deaths.	Mortality per cent.	SOUTH-WESTERN. Cases.	Deaths.	Mortality per cent.
Under 1	...	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0
1 to 2	1	0	0·0	1	1	100·0	...	...	0·0	...	...	0·0
2 ,, 3	...	...	0·0	...	...	0·0	1	0	0·0	...	...	0·0
3 ,, 4	1	0	0·0	1	1	100·0	...	...	0·0	2	2	100·0
4 ,, 5	...	...	0·0	1	1	100·0	1	0	0·0	...	...	0·0
5 ,, 10	...	...	0·0	1	0	0·0	2	1	50·0	...	...	0·0
10 ,, 15	...	...	0.0	...	...	0·0	...	...	0·0	...	...	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards ...	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
Total	2	0	...	4	3	...	4	1	...	3	3	...
Mortality per cent.	...	...	0·0	...	...	75·0	...	...	25 0	...	...	100·0

1896.

Ages.	FOUNTAIN. Cases.	Deaths.	Mortality per cent.	WESTERN. Cases.	Deaths.	Mortality per cent.	EASTERN. Cases.	Deaths.	Mortality per cent.	SOUTH-EASTERN. Cases.	Deaths.	Mortality per cent.	NORTH-WESTERN. Cases.	Deaths.	Mortality per cent.	NORTH-EASTERN. Cases.	Deaths.	Mortality per cent.	BROOK. Cases.	Deaths.	Mortality per cent.
Under 1	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0	...	...	0·0	...	...	0·0
1 to 2	2	1	50·0	...	...	0·0	1	1	100 0	...	...	0·0	...	...	0·0	1	1	100 0	...	...	0·0
2 ,, 3	...	...	0·0	...	...	0·0	...	...	0·0	2	2	100·0	...	...	0·0	...	...	0·0	...	...	0·0
3 ,, 4	2	1	50·0	...	...	0·0	2	0	0·0	1	0	0·0	...	...	0·0	...	...	0·0	...	...	0·0
4 ,, 5	...	...	0·0	...	...	0·0	...	...	0·0	3	0	0·0	...	...	0·0	...	...	0·0	1	0	0·0
5 ,, 10	2	0	0·0	1	1	100·0	2	0	0·0	3	0	0·0	...	...	0·0	...	...	0·0	...	...	0·0
10 ,, 15	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards ...	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
Total	6	2	...	1	1	...	5	1	...	9	2	...	1	1	...	1	1	...	1	0	...
Mortality per cent.	...	...	33·3	...	...	100·0	...	...	20·0	...	...	22·2	...	...	100·0	...	...	100·0	...	...	0·0

TABLE XXXA.—Percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found, in which Tracheotomy was performed, but no Antitoxic Serum was injected.

*1896.

Ages.	FOUNTAIN. Cases.	Deaths.	Mortality per cent.	EASTERN. Cases.	Deaths.	Mortality per cent.	SOUTH-EASTERN. Cases.	Deaths.	Mortality per cent.	SOUTH-WESTERN. Cases.	Deaths.	Mortality per cent.	NORTH-WESTERN. Cases.	Deaths.	Mortality per cent.
Under 1	..	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0
2 ,, 3	...	...	0·0	1	1	100·0	...	...	0·0	1	0	0·0	...	...	0·0
3 ,, 4	1	0	0·0	...	...	0·0	...	...	0·0	...	...	0·0	1	...	0·0
4 ,, 5	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0
5 ,, 10	...	...	0·0	...	...	0·0	1	0	0·0	...	...	0·0	...	...	0·0
10 ,, 15	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards...	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
Total	1	0	...	1	1	...	1	0	...	1	0	...	3	2	...
Mortality per cent.	...	...	0·0	...	...	100·0	...	...	0·0	...	...	0·0	...	...	66·6

* In 1895 there were at the Eastern Hospital 2 cases, 1 (2-3 years) which died, and 1 (4-5 years) which recovered. At the South-Eastern Hospital there was only 1 case (5-10 years), which recovered.

TABLE XXXIA.—Cases of Hæmorrhagic Diphtheria (with percentage Mortality, at different ages), in which Diphtheria bacilli were found, and in which Antitoxic Serum was injected.

1895.

Ages.	FOUNTAIN HOSPITAL.			WESTERN HOSPITAL.			EASTERN HOSPITAL.			SOUTH-EASTERN HOSPITAL.			SOUTH-WESTERN HOSPITAL.			NORTH-WESTERN HOSPITAL.			BROOK HOSPITAL.		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	...
1 to 2	1	1	100·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	...
2 ,, 3	1	1	100·0	1	1	100·0	...	...	0·0	1	0	0.0	...	...	0·0	...	...	0·0	...	...	...
3 ,, 4	1	1	100·0	...	...	0·0	...	...	0·0	5	4	80·0	...	...	0·0	...	...	0·0	...	...	...
4 ,, 5	1	1	100·0	1	1	100·0	2	2	100·0	8	8	100·0	...	...	0·0	1	1	100·0	...	...	...
5 ,, 10	7	7	100·0	7	7	100·0	3	3	100·0	13	13	100·0	4	4	100·0	1	1	100·0	...	...	...
10 ,, 15	...	...	0·0	...	...	0·0	2	2	100·0	1	1	100·0	...	...	0·0	...	...	0·0	...	...	...
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	...
20 and upwards...	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	...
Total	11	11	100·0	9	9	100·0	7	7	100·0	28	26	92·8	4	4	100·0	2	2	100·0	...	...	...

1896.

Ages.	FOUNTAIN HOSPITAL.			WESTERN HOSPITAL.			EASTERN HOSPITAL.			SOUTH-EASTERN HOSPITAL.			SOUTH-WESTERN HOSPITAL.			NORTH-WESTERN HOSPITAL.			BROOK HOSPITAL.		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2	1	1	100·0	...	...	0·0	...	...	0·0	1	1	100·0	...	...	0·0	...	...	0·0	...	...	0·0
2 ,, 3	1	1	100·0	3	3	100·0	...	...	0·0	4	4	100·0	...	...	0·0	1	1	100·0	...	...	0·0
3 ,, 4	3	3	100·0	1	1	100·0	1	1	100·0	4	4	100·0	2	2	100·0	...	...	0·0	...	...	0·0
4 ,, 5	4	4	100·0	3	3	100·0	2	2	100·0	4	4	100·0	1	1	100·0	2	2	100·0	...	...	0·0
5 ,, 10	16	15	93·7	12	12	100·0	8	8	100·0	4	4	100·0	5	5	100·0	4	4	100·0	1	1	100·0
10 ,, 15	1	1	100·0	1	1	100·0	2	2	100·0	2	2	100·0	1	1	100·0	...	...	0·0	...	...	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards...	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
Total	26	25	96·1	20	20	100·0	13	13	100·0	19	19	100·0	9	9	100·0	7	7	100·0	1	1	100·0

TABLE XXXIIA.—Cases of Hæmorrhagic Diphtheria (with percentage Mortality, at different ages) in which Diphtheria bacilli were found but in which no Antitoxic Serum was injected.

Ages.	1895.															1896.														
	FOUNTAIN.			WESTERN.			EASTERN.			SOUTH-EASTERN.			NORTH-WESTERN.			FOUNTAIN.			WESTERN.			EASTERN.			SOUTH-EASTERN.			NORTH-WESTERN.		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0	...	...	0·0
2 ,, 3	1	1	100·0	...	...	0·0	...	...	0·0	1	1	100·0	...	...	0·0	...	...	0·0	1	1	100·0	...	...	0·0	2	2	100·0	...	...	0·0
3 ,, 4	...	...	0·0	1	1	100·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0	...	...	0·0
4 ,, 5	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	2	2	100·0
5 ,, 10	3	3	100·0	...	...	0·0	2	2	100·0	1	1	100·0	2	2	100·0	1	1	100·0	...	...	0·0	2	2	100·0	1	1	100·0	...	...	0·0
10 ,, 15	2	2	100·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	1	1	100·0	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0.0	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
Total	6	6	100·0	1	1	100·0	2	2	100·0	2	2	100·0	2	2	100·0	1	1	100·0	2	2	100·0	2	2	100·0	5	5	100·0	2	2	100·0

TABLE XXXIIIA.—Cases of Hæmorrhagic Diphtheria (with percentage Mortality, at different ages) in which no Diphtheria bacilli were found, but in which Antitoxic Serum was injected.

TABLE XXXIVA.—Cases of Hæmorrhagic Diphtheria (with percentage Mortality, at different ages) in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

Ages.	XXXIIIA. 1896.						XXXIVA. 1895.			XXXIVA. 1896.		
	WESTERN.			SOUTH-EASTERN.			WESTERN.			SOUTH-EASTERN.		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
1 to 2	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
2 ,, 3	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
3 ,, 4	...	...	0·0	1	1	100·0	1	1	100·0	...	...	0·0
4 ,, 5	...	...	0·0	1	1	100·0	...	...	0·0	...	...	0·0
5 ,, 10	2	2	100·0	...	...	0·0	...	...	0·0	1	0	0·0
10 ,, 15	...	...	0·0	1	1	100·0	...	...	0·0	...	...	0·0
15 ,, 20	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
20 and upwards ...	...	...	0·0	...	...	0·0	...	...	0·0	...	...	0·0
Total	2	2	100·0	3	3	100·0	1	1	100·0	1	0	0·0
Mortality per cent. ..	...	...	...	...	...	...	...	...	...	...	...	..

Table XXXVa.—Showing percentage Mortality, at different ages, of cases of Diphtheria which had been sent in certified as suffering from Scarlet Fever and Diphtheria in which Diphtheria bacilli were found and Antitoxic Serum injected.

1895.

Ages.	Fountain.				Western Hospital.				Eastern Hospital.				South-Eastern.				South-Western.				North-Western.				Total.			Total.		
	Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.			Antitoxic Serum from Laboratories.		
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	1	1	1	...	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	100·0	3	1	33·3
1 to 2	...	...	1	...	1	1	...	...	2	1	2	1	...	...	...	...	1	1	1	...	...	...	1	1	4	3	75·0	5	2	40·0
2 ,, 3	...	...	...	...	...	...	3	...	3	1	4	1	...	...	...	...	...	...	1	1	...	...	...	...	3	1	33·3	8	2	25·0
3 ,, 4	4	...	1	1	1	...	11	4	1	1	3	1	...	...	...	...	2	...	4	1	...	...	...	...	8	1	12·5	19	7	36·8
4 ,, 5	4	...	4	...	2	1	5	2	5	2	5	1	1	...	3	...	1	1	2	...	...	...	...	...	13	4	30·7	19	3	15·7
5 ,, 10	5	2	7	...	8	2	15	2	8	3	6	1	...	...	2	...	4	...	11	1	1	...	3	1	26	7	26·9	44	5	11·3
10 ,, 15	1	...	4	...	1	...	1	...	3	1	2	...	1	...	1	...	...	...	2	...	...	...	1	...	6	1	16·6	11	...	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	0·0	1	...	0·0
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Total	15	3	18	1	13	4	36	8	22	9	23	6	2	...	6	...	8	2	22	3	1	...	5	2	61	18	...	110	20	...
Mortality per cent. ...	...	20·0	...	5·5	...	30·7	...	22·2	...	40·9	...	26·08	...	0·0	...	0·0	...	25·0	...	13·6	...	0·0	...	40·0	...	...	29·5	...	...	18·1

1896.*

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	100·0
1 to 2	4	2	5	1	1	...	...	...	...	...	...	...	...	...	10	3	30·0
2 ,, 3	9	2	12	4	4	3	2	...	...	...	1	...	...	...	28	9	32·1
3 ,, 4	14	6	12	4	5	2	5	3	1	...	5	4	...	...	42	19	45·2
4 ,, 5	12	2	14	3	12	5	3	1	2	1	3	...	...	...	46	12	26·08
5 ,, 10	39	4	33	4	19	1	10	1	2	...	6	1	3	...	112	11	9·8
10 ,, 15	7	...	3	2	5	1	2	...	1	...	...	...	...	...	18	3	16·6
15 ,, 20	1	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	0·0
20 and upwards	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	0·0
Total	86	16	81	19	47	12	22	5	6	1	15	5	3	...	260	58	...
Mortality per cent. ...	...	18·6	...	23·4	...	25·5	...	22·7	...	16·6	...	33·3	...	0·0	...	22·2	...

* In this year the whole of the Antitoxic Serum used in the Hospitals was supplied from the Laboratories of the Royal Colleges.

TABLE XXXVIA.—Showing percentage Mortality, at different ages, of cases of Diphtheria which had been sent in certified as suffering from Scarlet Fever in which Diphtheria bacilli were found and Antitoxic Serum was injected.

1895.

Ages.	FOUNTAIN.				WESTERN.				EASTERN.				SOUTH-EASTERN.				TOTAL.			TOTAL.		
	Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.			Antitoxic Serum from Laboratories.		
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
1 to 2	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	2	...	0·0	...	...	0·0
2 ,, 3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	0·0	1	...	0·0
3 ,, 4	...	...	2	...	...	...	1	...	...	...	...	...	...	...	2	1	...	...	0·0	5	1	20·0
4 ,, 5	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	0·0	2	...	0·0
5 ,, 10	...	...	...	...	...	...	...	...	...	...	...	...	1	...	5	...	1	...	0·0	5	...	0·0
10 ,, 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Total	1	...	3	...	...	...	1	...	1	...	...	...	2	...	9	1	4	...	...	13	1	...
Mortality per cent.	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	0·0	...	11·1	...	...	0·0	...	...	7·6

1896.*

Ages.	FOUNTAIN.		WESTERN.		EASTERN.		SOUTH-EASTERN.		SOUTH-WESTERN.		NORTH-EASTERN.		BROOK.		TOTAL.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	2	1	1	...	...	...	...	...	...	...	...	...	3	1	33·3
1 to 2	...	...	3	1	...	...	...	...	...	...	1	1	1	1	5	3	60·0
2 ,, 3	2	...	4	...	...	...	...	...	1	1	3	1	...	...	10	2	20·0
3 ,, 4	...	...	5	1	2	...	3	1	1	1	1	...	1	...	13	3	23·07
4 ,, 5	3	2	...	...	...	...	...	...	...	...	5	1	1	1	9	4	44·4
5 ,, 10	4	...	6	...	5	...	1	...	...	...	5	3	1	...	22	3	13·6
10 ,, 15	...	...	...	...	...	...	1	...	1	...	2	1	...	...	4	1	25·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
20 and upwards ...	...	...	2	...	...	...	1	...	...	...	1	...	...	...	4	...	0·0
Total	9	2	22	3	8	...	6	1	3	2	18	7	4	2	70	17	...
Mortality per cent.	...	22·2	...	13·6	...	0·0	...	16·6	...	66·6	...	38·8	...	50·0	...	24·2	...

* In this year the whole of the Antitoxic Serum used in the Hospitals was supplied from the Laboratories of the Royal Colleges.

TABLE XXXVA.—Showing percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found, but which had been sent in certified as suffering from Scarlet Fever and Diphtheria and in which Antitoxic Serum was injected.

1895.

Ages.	FOUNTAIN.				WESTERN.				EASTERN.				SOUTH-EASTERN.				TOTAL.			TOTAL.		
	Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.			Antitoxic Serum from Laboratories.		
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
1 to 2	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	0·0	2	...	0·0
2 „ 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
3 „ 4	...	...	...	...	2	1	...	...	2	...	...	...	1	...	1	1	5	1	20·0	1	1	100·0
4 „ 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	0·0	1	...	0·0
5 „ 10	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	1	...	0·0	1	...	0·0
10 „ 15	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	1	...	0·0
15 „ 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
20 and upwards ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
Total	...	...	1	...	2	1	2	...	2	...	1	...	2	...	2	1	6	1	...	6	1	...
Mortality per cent.	...	0·0	...	0·0	...	50·0	...	0·0	...	0·0	...	0·0	...	0·0	...	50·0	...	...	16·6	...	...	16·6

1896.*

Ages.	FOUNTAIN.		WESTERN.		EASTERN.		SOUTH-EASTERN.		BROOK.		TOTAL.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	0·0
2 „ 3	...	...	...	...	...	...	1	...	...	...	1	...	0·0
3 „ 4	1	...	1	...	1	...	...	...	1	1	4	1	25·0
4 „ 5	1	...	1	...	2	1	1	...	...	...	5	1	20·0
5 „ 10	3	2	2	...	1	...	1	...	...	...	7	2	28·5
10 „ 15	...	...	...	...	...	...	1	1	...	...	1	1	100·0
15 „ 20	1	...	...	...	...	...	...	...	...	...	1	...	0·0
20 and upwards ...	...	...	1	...	...	...	...	...	...	...	1	...	0·0
Total	6	2	5	...	4	1	4	1	1	1	20	5	...
Mortality per cent.	...	33·3	...	0·0	...	25·0	...	25·0	...	100·0	...	25·0	...

* In this year the whole of the Antitoxic Serum used in the Hospitals was supplied from the Laboratories of the Royal Colleges.

Table XXXVIa.—Showing percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found which had been sent in certified as suffering from Scarlet Fever, but in which Antitoxic Serum was injected.

1895.

Ages.	Fountain.				Western.				Eastern.				South-Eastern.				South-Western.				Total.			Total.		
	Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.		Antitoxic Serum from Laboratories.		Antitoxic Serum from other Sources.			Antitoxic Serum from Laboratories.		
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Under 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·0
1 to 2	...	...	...	...	1	...	...	...	3	3	1	1	1	...	...	...	...	...	...	...	5	3	60·0	1	1	100·0
2 ,, 3	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	2	...	0·0	...	...	0·0
3 ,, 4	...	...	...	...	...	...	1	1	...	...	...	...	1	...	1	1	3	2	...	...	4	2	50·0	2	2	100·0
4 ,, 5	...	...	...	...	1	...	...	...	1	...	1	1	1	...	...	...	1	1	...	...	4	1	25·0	1	1	100·0
5 ,, 10	...	...	1	1	1	...	2	...	2	1	...	...	3	...	...	...	2	...	...	...	8	1	12·5	3	1	33·3
10 ,, 15	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	4	...	0·0	...	...	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	1	...	0·0	1	...	0·0
20 and upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	0·0	1	...	0·0
Total	...	...	1	1	4	...	3	1	8	4	2	2	8	..	3	1	8	3	...	...	28	7	...	9	5	...
Mortality per cent.	...	0·0	...	100·0	...	0·0	...	33·3	...	50·0	...	100·0	...	0·0	...	33·3	...	37·5	...	0·0	...	25·0	...	...	55·5	...

1896.*

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Eastern.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	1	...	...	...	...	...	1	...	...	...	1	...	...	...	3	...	0·0
1 to 2	3	1	2	1	1	1	1	1	...	...	1	1	...	...	8	5	62·5
2 ,, 3	3	1	5	2	3	1	1	...	1	...	...	...	...	...	13	4	30·7
3 ,, 4	2	2	3	1	1	1	3	2	...	...	...	...	1	...	10	6	60·0
4 ,, 5	3	1	2	1	1	...	1	...	...	...	4	1	1	1	12	4	33·3
5 ,, 10	10	2	12	2	6	1	8	1	...	...	...	...	...	...	36	6	16·6
10 ,, 15	4	...	1	...	...	...	1	...	2	1	...	...	1	...	9	1	11·1
15 ,, 20	...	...	...	...	1	...	1	...	...	...	...	...	1	...	3	...	0·0
20 and upwards...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	0·0
Total	26	7	25	7	13	4	17	4	4	1	6	2	4	1	95	26	...
Mortality per cent.	...	26·9	...	28·0	...	30·7	...	23·5	...	25·0	...	33·3	...	25·0	...	27·3	...

* In this year the whole of the Antitoxic Serum used in the Hospitals was supplied from the Laboratories of the Royal Colleges.

TABLE XXXVIIA.—Showing percentage Mortality, at different ages, of cases of Diphtheria in which Diphtheria bacilli were found which had been sent in certified as suffering from Scarlet Fever and Diphtheria, but in which no Antitoxic Serum was injected.

1895.

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		North-Eastern.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	0·0
1 to 2	...	...	2	1	2	1	...	...	...	...	...	...	...	...	...	...	4	2	50·0
2 ,, 3	4	1	1	...	11	5	1	1	1	1	...	...	...	...	...	...	18	8	44·4
3 ,, 4	4	3	4	2	5	...	4	1	2	...	4	...	...	...	...	...	23	6	26·09
4 ,, 5	7	1	2	1	9	1	2	...	2	1	1	1	...	...	...	...	23	5	21·7
5 ,, 10	29	2	10	...	31	4	9	1	7	...	10	4	...	...	...	...	96	11	11·4
10 ,, 15	7	...	4	...	18	2	2	...	2	...	...	...	...	...	...	...	33	2	6·06
15 ,, 20	3	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	6	...	0·0
20 and upwards	2	...	1	...	2	...	...	...	1	...	...	...	..	...	...	...	6	...	0·0
Total	56	7	26	4	79	13	19	3	16	2	15	5	...	...	...	...	211	34	...
Mortality per cent. ...	...	12·5	...	15·3	...	16·4	...	15·7	...	12·5	...	33·3	...	...	...	...	...	16·1	...

1896.

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		North-Eastern.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1	100·0
1 to 2	1	...	...	...	...	...	3	2	1	1	3	2	...	...	...	...	8	5	62·5
2 ,, 3	4	1	2	1	5	1	4	2	1	1	2	2	...	...	...	...	18	8	44·4
3 ,, 4	7	1	5	1	1	...	3	1	...	...	7	3	...	...	...	...	23	6	26·08
4 ,, 5	5	...	4	1	8	...	3	1	...	...	6	1	...	...	1	1	27	4	14·8
5 ,, 10	21	2	17	...	15	...	6	...	5	1	6	2	...	...	...	...	70	5	7·1
10 ,, 15	4	...	3	...	5	...	2	...	1	...	...	...	...	...	...	...	15	...	0·0
15 ,, 20	3	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	5	...	0·0
20 and upwards	2	...	2	...	2	...	1	...	...	...	...	...	...	...	...	...	7	...	0·0
Total	47	4	34	3	36	1	23	6	9	4	24	10	...	...	1	1	174	29	...
Mortality per cent. ...	...	8.5	...	8·8	...	2·7	...	26·08	...	44·4	...	41·6	...	...	...	100·0	...	16·6	...

TABLE XXXVIIIA.—Showing percentage Mortality, at different ages, of cases of Diphtheria in which Diphtheria bacilli were found, but which had been sent in certified as suffering from Scarlet Fever and in which no Antitoxic Serum was injected.

1895.

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		North-Eastern.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	...	0·0
1 to 2	5	2	...	...	...	...	...	...	...	...	...	...	3	1	...	...	8	3	37·5
2 ,, 3	10	3	...	...	1	1	1	...	...	...	...	...	13	7	...	...	25	11	44·0
3 ,, 4	7	...	...	...	1	...	3	...	...	...	1	...	10	2	...	...	22	2	9·09
4 ,, 5	8	1	1	1	3	1	3	..	...	...	...	...	6	1	...	...	21	4	19·04
5 ,, 10	24	1	1	...	13	...	11	1	2	...	...	...	18	2	...	...	69	4	5·7
10 ,, 15	8	...	...	...	5	...	3	...	1	...	...	...	6	...	...	...	23	...	0·0
15 ,, 20	1	...	...	...	2	...	1	...	...	...	1	...	...	...	...	...	5	...	0·0
20 and upwards	1	...	...	...	1	...	1	...	...	...	...	...	2	...	...	...	5	...	0·0
Total	65	7	2	1	26	2	24	1	3	...	2	...	58	13	...	...	180	24	...
Mortality per cent. ...	...	10·7	...	50·0	...	7·6	...	4·1	...	0·0	...	0·0	...	22·4	...	...	...	13·3	...

1896.

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		North-Eastern.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	...	...	1	1	1	...	...	...	...	...	...	...	...	..	2	1	50·0
1 to 2	3	1	1	...	1	1	1	1	...	...	...	...	2	...	...	...	8	3	37·5
2 ,, 3	1	1	3	...	2	...	5	2	...	...	...	...	3	...	2	...	16	3	18·7
3 ,, 4	7	1	2	...	3	...	...	...	...	...	1	...	3	...	3	...	19	1	5·2
4 ,, 5	8	1	3	...	3	1	5	...	...	...	1	...	3	...	1	...	24	2	8·3
5 ,, 10	22	1	12	...	9	...	12	...	2	...	3	...	9	2	4	...	73	3	4·1
10 ,, 15	8	...	3	...	5	...	5	...	2	..	...	...	5	...	1	...	29	...	0·0
15 ,, 20	3	...	3	...	...	...	...	...	...	...	...	...	2	...	1	...	9	...	0·0
20 and upwards	...	...	2	...	1	...	3	...	1	...	...	...	2	...	1	...	10	...	0·0
Total	52	5	29	...	25	3	32	3	5	...	5	...	29	2	13	...	190	13	...
Mortality per cent. ...	...	9·6	...	0·0	...	12·0	...	9·3	...	0·0	...	0·0	...	6·8	...	0·0	...	6·8	...

TABLE XXXIXA.—Showing percentage Mortality, at different ages, of cases in which no Diphtheria bacilli were found, and in which no Antitoxic Serum was injected, but which had been sent in certified as suffering from Scarlet Fever and Diphtheria.

1895.

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	...	...	1	1	...	...	...	...	1	1	...	...	2	2	100·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
2 ,, 3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
3 ,, 4	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	0·0
4 ,, 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
5 ,, 10	1	1	1	...	...	...	2	1	...	...	...	...	...	...	4	2	50·0
10 ,, 15	1	...	...	...	1	...	1	...	...	...	1	...	...	...	4	...	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Total	2	1	1	...	2	1	4	1	...	...	2	1	...	...	11	4	...
Mortality per cent.	...	50·0	...	0·0	...	50·0	...	25·0	...	...	...	50·0	...	...	...	36·3	...

1896.

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	0·0
1 to 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
2 ,, 3	...	...	2	2	1	1	...	...	...	...	...	...	...	...	3	3	100·0
3 ,, 4	...	...	...	...	1	1	...	...	...	...	...	...	...	...	1	1	100·0
4 ,, 5	1	1	1	1	1	...	3	1	...	...	...	...	...	...	6	3	50·0
5 ,, 10	2	...	1	...	2	...	1	...	2	...	...	..	1	1	9	1	11·1
10 ,, 15	1	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	0·0
15 ,, 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
20 and upwards...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0
Total	4	1	4	3	5	2	6	1	2	...	...	...	1	1	22	8	...
Mortality per cent.	...	25·0	...	75·0	...	40·0	...	16·6	...	0·0	...	...	...	100·0	...	36·3	...

TABLE XLA.—Showing percentage Mortality, at different ages, of cases which had be sent in certified as suffering from Scarlet Fever in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

1895.

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		North-Eastern.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	...	...	...	...	2	1	1	1	...	...	...	...	2	...	...	...	5	2	40·0
1 to 2	2	...	1	...	5	1	3	...	1	...	...	...	6	...	...	...	18	1	5·5
2 ,, 3	6	2	6	1	7	2	3	2	...	...	1	...	7	1	...	...	30	8	26·6
3 ,, 4	6	2	4	1	11	3	9	5	3	...	2	1	11	...	...	...	46	12	26·08
4 ,, 5	11	2	6	1	9	2	7	2	1	...	2	1	15	4	...	...	51	12	23·5
5 ,, 10	23	3	14	2	41	1	24	1	3	...	6	1	32	4	...	...	143	12	8·3
10 ,, 15	19	...	15	...	24	...	15	1	1	...	2	...	16	...	...	...	92	1	1·08
15 ,, 20	4	...	3	...	7	1	8	...	1	...	1	...	6	...	...	...	30	1	3·3
20 and upwards...	2	...	5	1	3	...	7	...	...	...	2	...	4	...	...	...	23	1	4·3
Total	73	9	54	6	109	11	77	12	10	...	16	3	99	9	...	...	438	50	...
Mortality per cent.	...	12·3	...	11·1	...	10·1	...	15·5	...	0·0	...	18·7	...	9·09	...	...	...	11·4	...

1896.

Ages.	Fountain.		Western.		Eastern.		South-Eastern.		South-Western.		North-Western.		North-Eastern.		Brook.		Total.		Mortality per cent.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
Under 1	3	2	3	2	1	1	...	...	...	...	...	...	...	...	...	...	7	5	71·4
1 to 2	7	1	3	...	6	2	5	...	1	...	...	...	2	1	...	...	24	4	16·6
2 ,, 3	13	2	2	1	9	2	5	...	4	3	3	1	2	...	2	1	40	10	25·0
3 ,, 4	15	2	9	...	20	2	9	2	4	...	3	...	7	...	1	...	68	6	8·8
4 ,, 5	13	...	9	...	19	5	8	1	...	...	4	1	9	1	1	...	63	8	12·6
5 ,, 10	61	1	21	3	48	6	32	3	6	...	4	...	16	...	8	...	196	13	6·6
10 ,, 15	21	1	15	...	28	2	16	1	7	...	4	1	14	...	2	...	107	5	4·6
15 ,, 20	11	...	2	...	10	...	7	1	3	...	...	...	3	...	2	...	38	1	2·6
20 and upwards...	7	...	4	...	7	1	7	1	1	...	2	...	2	...	...	...	30	2	6·6
Total	151	9	68	6	148	21	89	9	26	3	20	3	55	2	16	1	573	54	...
Mortality per cent.	...	5·9	...	8·8	...	14·1	...	10·1	...	11·5	...	15·0	...	3·6	...	6·2	...	9·4	...

TABLE XLIA.—Showing cases of Diphtheria, at different ages, in which Diphtheria bacilli were found and Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of Days in Hospital is given under each heading.

1895.

Ages.	FOUNTAIN.						WESTERN.						EASTERN.						SOUTH-EASTERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1...	2	106	53·0	2	11	5·5	5	347	69·4	2	10	5·0	...	...	...	4	78	19·5	4	241	59·9	3	74	24·6
1 to 2...	10	781	78·1	7	183	26·1	15	1,063	70·8	12	247	20·5	14	757	54·07	20	328	16·4	15	1,150	76·6	13	182	14·0
2 ,, 3...	19	1,289	67·8	11	188	17·09	26	2,087	80·2	11	236	21·4	19	1,368	72·0	7	228	32·5	30	2,543	84·7	12	255	21·2
3 ,, 4...	26	1,883	72·4	16	222	13·8	45	3,276	72·8	22	222	10·09	34	2,591	76·2	16	279	17·4	32	3,000	93·7	10	173	17·3
4 ,, 5...	40	2,795	69·8	7	41	5·8	42	3,510	83·5	22	199	9·04	25	2,207	88·2	17	256	15·05	42	3,772	89·8	18	127	7·05
5 ,, 10...	76	5,287	69·5	28	288	10·2	120	8,499	70·8	36	415	11·5	79	5,934	75·1	32	395	12·3	132	11,403	86·2	37	296	8·0
10 ,, 15...	29	1,934	66·6	2	18	9·0	31	1,803	58·1	5	38	7·6	24	1,645	68·5	6	115	19·1	44	3,183	72·3	6	159	26·5
15 ,, 20...	4	200	50·0	2	39	19·5	5	363	72·6	2	24	12·0	4	172	43·0	...	...	...	13	816	62·7	...	...	...
20 and upwards	6	230	38·3	...	...	...	11	570	51·8	...	...	...	1	35	35·0	...	...	...	9	547	60·7	...	...	...
Total	212	14,505	...	75	990	...	300	21,518	...	112	1,391	...	200	14,709	...	102	1,679	...	321	26,655	...	99	1,266	...
Average number of Days in Hospital...	...	...	68·4	...	...	13·2	...	...	71·7	...	...	12·4	...	...	73·5	...	...	16·4	...	...	83·03	...	...	12·7

Ages.	SOUTH-WESTERN.						NORTH-WESTERN.						NORTHERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1...	2	80	40·0	3	17	5·6	4	123	30·7	4	29	7·2	...	...	...	...	...	...
1 to 2...	12	682	56·8	14	133	9·5	13	701	53·9	18	179	9·9	...	...	...	...	...	...
2 ,, 3...	12	566	47·1	13	133	10·2	13	937	72·07	8	97	12·1	...	...	...	...	...	...
3 ,, 4...	26	1,378	53·0	7	170	24·2	28	2,025	72·3	18	130	7·2	10	695	69·5	1	33	33·0
4 ,, 5...	25	1,175	47·0	19	253	13·3	17	1,088	64·0	13	153	11·7	8	650	81·2	2	94	47·0
5 ,, 10...	104	5,107	49·1	27	279	10·3	74	5,662	76·5	19	169	8·8	27	2,103	77·8	2	63	31·5
10 ,, 15...	24	1,198	49·9	6	52	8·6	19	1,085	57·1	5	40	8·0	13	1,276	98·1	...	...	..
15 ,, 20...	3	305	101·6	1	14	14·0	5	181	36·2	2	4	2·0	3	222	74·0	...	...	...
20 and upwards	3	106	35·3	2	10	5·0	14	500	35·7	1	2	2·0	3	228	76·0	...	...	...
Total	211	10,597	...	92	1,061	...	187	12,302	...	88	803	...	64	5,174	...	5	190	...
Average number of Days in Hospital...	...	...	50·2	...	...	11·5	...	...	65·7	...	...	9·1	...	...	80·8	...	...	38·0

TABLE XLIA. (*continued*).—Showing cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, and Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of Days in Hospital is given under each heading.

1896.

Ages.	FOUNTAIN.						WESTERN.						EASTERN.						SOUTH-EASTERN.						SOUTH-WESTERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1...	1	35	35·0	...	...	...	8	513	64·1	5	72	14·4	6	442	73·6	2	7	3·5	8	529	66·1	7	47	6·7	6	307	51·1	2	5	2·5
1 to 2...	16	926	57·8	19	181	9·5	22	1,561	70·9	22	476	21·8	21	1,259	59·9	4	47	11·7	18	1,563	86·8	15	230	15·3	6	313	52·1	5	40	8·0
2 ,, 3...	39	2,520	64·6	14	246	17·5	50	3,983	79·6	27	363	13·4	32	1,919	59·9	13	241	18·5	36	2,768	76·8	15	167	11·1	19	1,154	60·7	6	40	6·6
3 ,, 4...	62	3,815	61·5	28	390	13·9	74	6,294	85·05	22	287	13·04	59	3,900	66·09	18	264	14·6	57	5,521	96·8	20	180	9·0	24	2,529	105·3	4	62	15·5
4 ,, 5...	73	4,677	64·06	23	330	14·3	59	5,118	86·7	30	375	12·5	55	4,252	77·3	20	244	12·2	73	6,847	93·7	11	135	12·2	33	2,049	62·09	8	63	7·8
5 ,, 10...	222	13,770	62·02	54	495	9·1	181	14,031	77·5	39	421	10·7	159	12,218	76·7	32	308	9·6	159	15,531	97·6	32	494	15·4	112	6,705	59·8	38	353	9·2
10 ,, 15...	54	3,482	64·4	6	51	8·5	34	2,113	62·1	7	73	10·4	45	2,843	63·1	5	96	19·2	34	2,713	79·7	7	50	7·1	35	1,857	53·05	5	96	19·2
15 ,, 20...	8	451	56·3	...	...	...	12	685	57·08	2	49	24·5	4	200	50·0	...	...	...	6	408	68·0	2	23	11·5	...	...	...	1	8	8·0
20 and upwards	18	910	50·5	1	13	13·0	19	787	41·4	...	...	...	16	875	54·6	...	...	...	7	572	81·7	2	7	3·5	7	309	44·1	...	...	...
Total	493	30,586	...	145	1,706	...	459	35,085	...	154	2,116	...	397	27,908	...	94	1,207	...	398	36,452	...	111	1,333	...	242	15,223	...	69	667	...
Average number of Days in Hospital...	...	...	62·04	...	...	11·7	...	...	76·4	...	...	13·7	...	...	70·2	...	...	12·8	...	...	91·5	...	...	12·009	...	...	62·9	...	...	9·6

Ages.	NORTH-WESTERN.						NORTH-EASTERN.						BROOK.						NORTHERN.						GORE FARM.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1...	2	55	27·5	2	41	20·5	...	...	...	...	...	...	5	229	45·8	1	8	8·0	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2...	13	623	47·9	13	167	12·8	...	...	...	1	47	47·0	7	398	56·8	6	80	13·3	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3...	23	1,329	57·7	14	76	5·4	2	144	72·0	1	75	75·0	11	806	73·2	2	104	52·0	1	52	52·0	...	...	...	...	...	...	...	...	...
3 ,, 4...	41	2,319	56·5	18	212	11·7	1	56	56·0	...	...	...	19	1,505	79·2	5	36	7·2	25	1,945	77·8	1	15	15·0	4	475	118·7	...	...	...
4 ,, 5...	32	1,961	61·2	23	225	9·7	4	286	71·5	1	4	4·0	16	1,137	71·06	8	115	14·3	15	1,283	85·5	...	...	...	8	742	92·7	...	...	...
5 ,, 10...	104	5,599	53·8	49	776	15·8	2	137	68·5	3	74	24·6	56	4,636	82·7	17	272	16·0	95	7,727	81·3	2	78	39·0	33	2,556	77·4	...	...	...
10 ,, 15...	14	708	50·5	2	45	22·5	1	81	81·0	1	77	77·0	11	702	63·8	1	9	9·0	31	2,867	92·4	...	...	...	9	614	68·2	...	...	...
15 ,, 20...	2	106	53·0	...	...	...	...	...	...	...	...	...	2	106	53·0	...	...	...	7	560	80·0	...	...	...	...	...	...	...	...	...
20 and upwards	2	59	29·5	...	...	...	1	46	46·0	...	...	...	4	223	55·7	...	...	...	2	158	79·0	...	...	...	1	67	67·0	...	...	...
Total	233	12,759	...	121	1,542	...	11	750	...	7	277	...	131	9,742	...	40	624	...	176	14,592	...	3	93	...	55	4,454	...	...	...	...
Average number of Days in Hospital...	...	...	54·7	...	...	12·7	...	...	68·1	...	...	39·5	...	...	74·3	...	...	15·6	...	...	82·9	...	...	31·0	...	...	80·9	...	...	0·0

TABLE XLIIA.—Showing cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, but no Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of Days in Hospital is given under each heading.

1895.

Ages.	FOUNTAIN.						WESTERN.						EASTERN.						SOUTH-EASTERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1	4	201	50·2	2	24	12·0	3	203	67·6	...	...	...	1	23	23·0	2	11	5·5	1	45	45·0	...	...	...
1 to 2	14	911	65·07	6	26	4·3	2	246	123·0	3	29	9·6	2	126	63·0	8	194	24·2	3	271	90·3	1	1	1·0
2 ,, 3	21	1,671	79·5	10	113	11·3	12	864	72·0	1	25	25·0	20	1,400	70·0	15	280	18·6	3	184	61·3	3	25	8·3
3 ,, 4	22	1,693	76·9	12	170	14·1	17	1,156	68·0	5	35	7·0	23	1,741	75·6	12	107	8·9	7	606	86·5	1	26	26·0
4 ,, 5	36	2,653	73·6	3	28	9·3	17	1,082	63·6	2	22	11·0	36	2,823	78·4	13	105	8·07	9	745	82·7	...	...	...
5 ,, 10	141	9,590	68·01	11	172	15·6	47	3,252	69·1	4	81	20·2	112	7,886	70·4	28	424	15·1	29	2,359	81·3	5	79	15·8
10 ,, 15	61	3,493	57·2	2	13	6·5	26	1,420	54·6	1	10	10·0	72	2,626	36·4	4	115	28·7	14	958	68·0	...	...	...
15 ,, 20	27	1,367	50·6	2	12	6·0	10	531	53·1	1	21	21·0	26	597	22·9	1	12	12·0	5	274	54·8	...	...	...
20 and upwards	24	1,060	44·1	2	45	22·5	37	1,633	44·1	1	1	1·0	31	1,950	62·9	...	...	...	13	587	45·1	...	...	...
Total...	350	22,639	...	50	603	...	171	10,387	...	18	224	...	323	19,172	...	83	1,248	...	84	6,029	...	10	131	...
Average number of Days in Hospital...	...	...	64·6	...	...	12·06	...	...	60·7	...	...	12·4	...	...	59·3	...	...	15·04	...	...	71·7	...	...	13·1

Ages.	SOUTH-WESTERN.						NORTH-WESTERN.						NORTH-EASTERN.						NORTHERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1	2	105	52·5	...	...	...	4	155	38·7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	1	36	36·0	...	...	...	9	501	55·6	9	123	13·6	2	108	54·0	1	46	46·0	...	...	...	...	...	...
2 ,, 3	6	238	39·6	1	11	11·0	24	1,322	55·08	11	148	13·4	6	423	70·5	7	210	30·0	2	153	76·5	...	...	...
3 ,, 4	8	337	42·1	2	48	24·0	35	1,923	54·9	14	229	16·3	8	524	65·5	2	59	29·5	11	801	72·8	...	..	...
4 ,, 5	9	347	38·5	1	9	9·0	27	1,594	59·03	10	45	4·5	5	477	95·4	1	42	42·0	19	1,110	58·4	...	...	...
5 ,, 10	55	2,459	44·7	2	15	7·5	116	6,510	56·1	22	307	13·9	16	966	60·3	2	74	37·0	62	4,147	66·8	1	25	25·0
10 ,, 15	27	1,012	37·4	1	12	12·0	32	1,353	42·2	3	11	3·6	6	384	64·0	...	...	...	19	1,161	61·1	...	...	...
15 ,, 20	12	379	31·5	...	...	...	10	409	40·9	...	...	...	...	...	...	...	...	...	7	400	57·1	...	...	...
20 and upwards	14	409	29·2	...	...	...	20	575	28·7	...	...	...	2	77	38·5	...	...	...	1	35	35·0	...	...	...
Total	134	5,322	...	7	95	...	277	14,342	...	69	863	...	45	2,959	...	13	431	...	121	7,807	...	1	25	...
Average number of Days in Hospital	...	...	39·7	...	...	13·5	...	...	51·7	...	...	12·5	...	...	65·7	...	...	33·1	...	...	64·5	...	...	25·0

TABLE XLIIA. (*continued*).—Showing cases of Diphtheria, at different ages, in which Diphtheria bacilli were found, but no Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of Days in Hospital is given under each heading.

1896.

Ages.	FOUNTAIN.						WESTERN.						EASTERN.						SOUTH-EASTERN.						SOUTH-WESTERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1...	1	53	53·0	3	67	22·3	...	...	...	1	1	1·0	1	46	46·0	1	18	18·0	3	169	56·3	2	65	32·5	1	131	131·0	1	4	4·0
1 to 2...	5	276	55·2	7	36	5·1	8	449	56·1	1	1	1·0	4	218	54·5	2	60	30·0	3	374	124·6	4	40	10·0	2	68	34·0	2	11	5·5
2 ,, 3...	8	564	70·5	2	15	7·5	10	707	70·7	5	110	22·0	12	928	77·3	3	39	13·0	15	1,122	74·8	6	53	8·8	...	...	...	2	12	6·0
3 ,, 4...	26	1,955	75·1	5	100	20·0	17	1,260	74·1	2	15	7·5	19	1,395	73·4	2	23	11·5	9	818	90·8	3	28	9·3	7	267	38·1	2	18	9·0
4 ,, 5...	24	1,533	63·8	2	24	12·0	25	1,787	71·4	3	31	10·3	21	924	44·0	1	17	17·0	16	1,333	83·3	4	73	18·2	4	214	53·5	1	1	1·0
5 ,, 10...	119	7,212	60·6	7	56	8·0	71	5,043	71·02	1	2	2·0	84	5,222	62·1	5	15	3·0	56	4,332	77·2	5	103	20·6	72	3,352	46·5	2	13	6·5
10 ,, 15...	51	2,584	50·6	...	...	...	47	2,812	59·8	3	46	15·3	46	2,351	51·1	1	5	5·0	26	1,685	64·8	...	...	...	35	1,441	41·1	...	...	...
15 ,, 20...	21	1,030	49·04	...	...	...	20	949	47·4	1	4	4·0	6	284	47·3	...	...	...	13	849	65·3	...	...	...	17	564	33·1	...	...	...
20 and upwards	25	943	37·7	...	...	...	56	2,208	39·4	...	...	...	26	985	37·8	...	...	...	26	1,527	58·7	...	...	...	22	819	37·2	...	...	...
Total	280	16,150	...	26	298	...	254	15,215	...	17	210	...	219	12,353	...	15	177	...	167	12,209	...	24	362	...	160	6,856	...	10	59	...
Average number of Days in Hospital	...	...	57·6	...	...	11·4	...	...	59·9	...	...	12·3	...	...	56·4	...	...	11·8	...	...	73·1	...	...	15·08	...	...	42·8	...	...	5·9

Ages.	NORTH-WESTERN.						NORTH-EASTERN.						BROOK.						NORTHERN.						GORE FARM.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1...	3	151	50·3	1	3	3·0	...	...	...	...	...	...	1	34	34·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2...	2	137	68·5	10	68	6·8	2	93	46·5	...	...	...	1	39	39·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3...	26	1,445	55·5	16	124	7·7	3	206	68·6	...	...	...	2	204	102·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
3 ,, 4...	28	1,722	61·5	16	125	7·8	3	184	61·5	...	...	...	6	467	77·8	...	...	...	7	411	58·7	...	...	...	1	32	32·0	...	...	...
4 ,, 5...	42	2,839	67·5	17	145	8·5	3	181	60·3	...	...	...	4	307	76·7	1	9	9·0	10	1,178	117·8	1	46	46·0	1	75	75·0	...	...	..
5 ,, 10...	116	6,903	59·5	26	307	11·8	7	421	60·1	2	15	7·5	21	1,362	64·8	...	...	...	31	2,643	85·2	...	...	...	12	872	72·6	...	...	...
10 ,, 15...	48	2,179	45·3	2	63	31·5	5	216	43·2	...	...	...	9	539	59·8	...	...	...	16	1,161	72·5	...	...	...	10	565	56·5	...	...	...
15 ,, 20...	10	420	42·0	...	...	...	2	78	39·0	...	...	...	4	228	57·0	...	...	...	7	428	61·1	...	...	...	...	...	...	...	...	...
20 and upwards	14	463	33·07	...	...	...	2	99	49·5	...	...	...	4	201	50·2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	289	16,259	...	88	835	...	27	1,478	...	2	15	...	52	3,381	...	1	9	...	71	5,821	...	1	46	...	24	1,544	...	...	..	..
Average number of Days in Hospital...	...	...	56·2	...	...	9·4	...	...	54·7	...	...	7·5	...	...	65·01	...	...	9·0	...	...	81·9	...	...	46·0	...	...	64·3	...	..	0·0

Table XLIIIa.—Showing cases, at different ages, in which no Diphtheria bacilli were found but Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of Days in Hospital is given under each heading.

1895.

Ages	Fountain.						Western.					
	Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1	1	102	102·0	...	...	...	2	27	13·5	...	...	...
1 to 2	...	...	...	2	7	3·5	7	562	80·2	2	10	5·0
2 ,, 3	3	104	34·6	...	...	...	11	496	45·09	1	2	2·0
3 ,, 4	1	21	21·0	2	74	37·0	4	303	75·7	3	23	7·6
4 ,, 5	2	93	46·5	...	...	...	2	165	82·5	...	...	...
5 ,, 10	8	296	37·0	1	8	8·0	22	743	33·7	...	...	...
10 ,, 15	4	228	57·0	...	...	...	7	269	38·4	...	...	...
15 ,, 20	2	37	18·5	...	...	...	2	111	55·5	...	...	...
20 and upwards	1	18	18·0	...	...	...	9	249	27·6	1	21	21·0
Total	22	899	...	5	89	...	66	2,925	...	7	56	...
Average number of Days in Hospital...	...	...	40·8	...	...	17·8	...	...	44·3	...	...	8·0

Ages	Eastern.						South-Eastern.					
	Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1	...	...	...	3	64	21·3	1	45	45·0	...	...	...
1 to 2	1	54	54·0	6	57	9·5	4	193	48·2	...	...	...
2 ,, 3	6	367	61·1	2	70	35·0	3	138	46·0	1	24	24·0
3 ,, 4	5	336	67·2	1	5	5·0	10	722	72·2	1	50	50·0
4 ,, 5	4	195	48·7	2	59	29·1	6	447	74·5	1	7	7·0
5 ,, 10	16	674	42·1	3	28	9·3	24	1,617	67·3	1	4	4·0
10 ,, 15	9	218	24·2	2	14	7·0	15	775	51·6	2	23	11·5
15 ,, 20	1	39	39·0	...	...	...	8	379	47·3	...	...	...
20 and upwards	...	...	...	...	...	...	12	627	52·2	...	...	...
Total	42	1,883	...	19	297	...	83	4,943	...	6	108	...
Average number of Days in Hospital...	...	...	44·7	...	...	15·7	...	...	59·5	...	...	18·0

Ages.	South-Western.						North-Western.						Northern.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1	1	36	36·0	3	9	3·0	...	...	...	1	10	10·0	...	...	...	...	...	...
1 to 2	1	20	20·0	...	...	...	2	22	11·0	5	40	8·0	...	...	...	...	...	...
2 ,, 3	3	142	47·3	...	...	...	2	113	56·5	1	10	10·0	...	...	...	...	...	...
3 ,, 4	5	295	59·0	4	37	9·2	5	284	56·8	3	30	10·0	...	...	...	...	...	...
4 ,, 5	3	140	46·6	1	5	5·0	1	76	76·0	1	33	33·0	...	...	...	...	...	...
5 ,, 10	10	359	35·9	3	33	11·0	5	228	45·6	1	38	38·0	3	150	50·0	...	...	...
10 ,, 15	5	193	38·6	...	...	...	4	151	37·7	...	...	...	1	98	98·0	...	...	...
15 ,, 20	...	...	...	...	...	...	1	21	21·0	...	...	...	...	...	...	...	...	...
20 and upwards	...	...	...	...	...	...	9	190	21·1	1	2	2·0	...	...	...	...	...	...
Total	28	1,185	...	11	84	...	29	1,085	...	13	163	...	4	248	...	...	...	...
Average number of Days in Hospital...	...	...	42·3	...	...	7·6	...	..	37·4	...	...	12·5	...	...	62·0	...	...	0·0

TABLE XLIIIA. (*continued*).—Showing cases, at different ages, in which no Diphtheria bacilli were found, but Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of Days in Hospital is given under each heading.

1896.

Ages.	FOUNTAIN.						WESTERN.						EASTERN.						SOUTH-EASTERN.						SOUTH-WESTERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1	1	67	67·0	...	...	...	1	210	210·0	1	8	8·0	2	36	18·0	...	...	...	1	62	62·0	2	51	25·5	...	...	...	...	...	...
1 to 2	4	176	44·0	3	40	13·3	3	257	85·6	2	26	13·0	4	217	54·2	2	9	4·5	7	353	50·4	2	16	8·0	2	44	22·0	...	...	...
2 ,, 3	8	312	39·0	2	97	48·5	8	630	78·7	3	26	8·6	7	461	65·8	2	9	4·5	6	630	105·0	3	27	9·0	3	123	41·0	...	...	...
3 ,, 4	4	282	70·5	7	61	8·7	5	391	78·2	1	2	2·0	6	339	56·5	2	38	19·0	5	447	89·4	5	70	14·0	1	30	30·0	1	8	8·0
4 ,, 5	7	465	66·4	5	130	26·0	6	301	50·1	2	92	46·0	3	152	50·6	2	36	18·0	12	1,014	84·5	2	13	6·5	1	34	34·0	...	...	...
5 ,, 10	25	1,412	56·4	6	85	14·1	19	1,327	69·8	4	38	9·5	13	811	62·3	2	10	5·0	17	1,339	78·7	2	16	8·0	2	62	31·0	1	7	7·0
10 ,, 15	4	171	42·7	1	14	14.0	8	864	108·0	...	...	...	6	370	61·6	...	...	...	10	556	55·6	2	9	4·5	4	202	50·5	1	2	2·0
15 ,, 20	3	167	55·6	...	...	...	1	37	37·0	...	...	...	3	94	31·3	...	...	...	2	137	68·5	2	12	6·0	...	...	...	...	...	...
20 and upwards	7	214	30·5	...	...	...	4	286	71·5	1	4	4·0	1	31	31·0	...	...	...	4	279	68·7	...	...	...	2	110	55·0	1	3	3·0
Total	63	3,266	...	24	427	...	55	4,303	...	14	196	...	45	2,511	...	10	102	...	64	4,817	...	20	214	...	15	605	...	4	20	...
Average number of Days in Hospital	...	...	51·8	...	...	17·7	...	...	78·2	...	...	14·0	...	...	55·8	...	...	10·2	...	...	75·2	...	...	10·7	...	...	40·3	...	...	5·0

Ages.	NORTH-WESTERN.						NORTH-EASTERN.						BROOK.						NORTHERN.						GORE FARM.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1	2	51	25·5	1	6	6·0	1	47	47·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	...	...	...	4	38	9·5	...	...	...	1	2	2·0	1	194	194·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	1	73	73·0	4	64	16·0	...	...	...	...	...	...	1	51	51·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	4	169	42·2	...	...	...	...	...	...	...	...	...	2	184	92·0	1	6	6·0	3	203	67·6	...	...	...	1	64	64·0	...	...	...
4 ,, 5	6	252	42·0	...	...	...	3	209	69·6	1	14	14·0	2	134	67·0	1	11	11·0	3	285	95·0	...	...	...	1	96	96·0	...	...	...
5 ,, 10	9	429	47·6	2	7	3·5	...	...	...	...	...	...	5	331	66·2	...	...	...	10	615	61·5	1	120	120·0	5	408	81·6	...	...	...
10 ,, 15	6	259	43·1	1	5	5·0	...	...	...	...	...	...	2	102	51·0	1	11	11·0	5	421	84·2	...	...	...	1	57	57·0	...	...	...
15 ,, 20	1	22	22·0	...	...	...	...	...	...	...	...	...	1	72	72·0	...	...	...	2	98	49·0	...	...	...	2	111	55·5	...	...	...
20 and upwards	1	80	80·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	249	83·0	...	...	...	1	73	73·0	...	...	...
Total	30	1,335	...	12	120	...	4	256	...	2	16	...	14	1,068	...	3	28	...	26	1,871	...	1	120	...	11	809	...	...	...	...
Average number of Days in Hospital	...	...	44·5	...	...	10·0	...	...	64·0	..	...	8 0	...	...	76·2	...	...	9·3	...	...	71·9	...	...	120·0	...	...	73·5	...	...	00·0

TABLE XLIVA.—Showing cases, at different ages, in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of Days in Hospital is given under each heading.

1895.

Ages.	FOUNTAIN.						WESTERN.						EASTERN.						SOUTH-EASTERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1...	1	9	9·0	1	2	2·0	2	26	13·0	...	...	...	1	16	16·0	4	99	24·7	...	...	...	1	12	12·0
1 to 2...	6	276	46·0	2	12	6·0	3	144	48·0	1	3	3·0	6	286	47·6	4	43	10·7	3	125	41·6	...	...	...
2 ,, 3...	9	354	39·3	3	22	7·3	4	283	70·7	1	3	3·0	10	599	59·9	3	24	8·0	3	215	71·6	2	7	3·5
3 ,, 4...	9	747	83·0	2	35	17·5	8	397	49·6	3	22	7·3	14	640	45·7	3	32	10·6	8	705	88·1	5	61	12·2
4 ,, 5...	21	1,241	59·09	2	55	27·5	7	326	46·5	2	12	6·0	10	556	55·6	2	69	34·5	8	457	57·1	2	29	14·5
5 ,, 10...	59	3,569	60·4	5	76	15·2	34	1,027	30·2	3	38	12·6	69	3,066	44·4	4	28	7·0	33	3,172	96·1	3	34	11·3
10 ,, 15...	42	2,094	49·8	...	...	...	30	947	31·5	...	...	...	51	1,933	37·8	...	...	...	22	1,202	54·6	2	12	6·0
15 ,, 20...	17	578	34·0	...	...	...	15	462	30·8	...	...	...	32	964	30·1	2	15	7·5	14	453	32·3	...	...	...
20 and upwards	36	568	15·7	1	2	2·0	49	892	18·2	2	12	6·0	46	800	17·3	...	...	...	25	1,068	42·7	...	...	...
Total	200	9,436	...	16	204	...	152	4,504	...	12	90	...	239	8,860	...	22	310	...	116	7,397	...	15	155	...
Average number of Days in Hospital	...	...	47·1	...	...	12·7	...	...	29·6	...	...	7·5	...	...	37·07	...	...	14·09	...	...	63·7	...	...	10·3

Ages.	SOUTH-WESTERN.						NORTH-WESTERN.						NORTH-EASTERN.						NORTHERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1...	1	35	35·0	...	...	...	1	3	3·0	3	7	2·3	2	114	57·0	...	...	...	...	...	...	...	...	...
1 to 2...	1	23	23·0	...	...	...	4	97	24·2	2	21	10·5	6	281	46·8	...	...	...	...	...	...	...	...	...
2 ,, 3...	...	...	...	...	...	...	6	305	50·8	5	44	8·8	6	368	61·3	1	9	9·0	...	...	...	...	...	...
3 ,, 4...	6	216	36·0	...	...	...	10	410	41·0	2	29	14·5	11	690	62·7	...	...	...	7	290	41·4	...	...	...
4 ,, 5...	2	39	19·5	...	...	...	7	358	51·1	3	86	28·6	11	672	61·09	4	77	19·2	6	256	42·6	...	...	...
5 ,, 10...	20	535	26·7	1	9	9·0	28	879	31·3	5	18	3·6	28	1,585	56·6	4	87	21·7	32	1,582	49·4	...	...	...
10 ,, 15...	13	157	12·07	...	...	...	18	494	27·4	2	49	24·5	16	824	51·5	...	...	...	7	323	46·1	...	...	...
15 ,, 20...	10	202	20·2	1	5	5·0	10	188	18·8	1	4	4·0	6	202	33·6	...	...	...	1	21	21·0	...	...	...
20 and upwards	21	352	16·7	...	...	...	23	337	14·6	1	5	5·0	4	180	45·0	...	...	...	5	169	33·8	...	...	...
Total	74	1,559	...	2	14	...	107	3,071	...	24	263	...	90	4,916	...	9	173	...	58	2,641	...	...	...	...
Average number of Days in Hospital	...	...	21·06	...	...	7·0	...	...	28·7	...	...	10·9	...	...	54·6	...	...	19·2	...	...	45·5	...	...	0·0

TABLE XLIVA. (*continued*).—Showing cases, at different ages, in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected. These cases are placed under two headings—Recoveries and Deaths—and the average number of Days in Hospital is given under each heading.

1896.

Ages	FOUNTAIN.						WESTERN.						EASTERN.						SOUTH-EASTERN.						SOUTH-WESTERN.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1	1	14	14·0	3	39	13·0	1	112	112·0	2	16	8·0	...	...	...	1	7	7·0	3	60	20·0	...	...	...	...	...	...	...	...	...
1 to 2	6	327	54·5	1	6	6·0	4	215	53·7	1	2	2·0	6	233	38·8	2	20	10·0	7	323	46·1	3	36	12·0	2	131	65·5	...	...	...
2 ,, 3	11	749	68·09	3	35	11·6	7	320	45·7	4	60	15·0	10	702	70·2	4	60	15·0	9	871	96·7	...	...	...	3	184	61·3	4	106	26·5
3 ,, 4	15	945	63·0	2	22	11·0	13	886	68·1	1	2	2·0	25	1,258	50·3	5	96	19·2	9	785	87·2	2	36	18·0	6	359	59·8	...	...	...
4 ,, 5	18	635	35·2	2	24	12·0	17	671	39·4	1	38	38·0	22	1,058	48·04	5	64	12·8	12	717	59·7	3	15	5·0	3	88	29·3	...	...	...
5 ,, 10	82	3,576	43·6	2	75	37·5	47	2,132	45·3	5	47	9·4	68	3,173	46·6	5	100	20·0	49	2,576	52·5	2	28	14·0	21	939	44·7	...	...	...
10 ,, 15	54	2,316	42·8	1	25	25·0	37	1,043	28·1	...	...	...	47	1,562	33·2	2	5	2·5	27	1,246	46·1	2	97	48·5	24	882	36·7	1	5	5·0
15 ,, 20	32	722	22·5	...	...	...	25	499	19·9	...	...	...	26	663	25·5	...	...	...	26	765	29·4	1	5	5·0	21	402	19·1	...	...	...
20 and upwards	37	746	20·1	...	...	...	51	981	19·2	2	4	2·0	40	745	18·6	1	86	86·0	34	1,097	31·2	1	7	7·0	30	486	16·2	...	...	...
Total	256	10,030	...	14	226	...	202	6,859	...	16	169	...	244	9,394	...	25	438	...	176	8,440	...	14	224	...	110	3,471	...	5	111	...
Average number of Days in Hospital	...	...	39·1	...	...	16·1	...	...	33·9	...	...	10·5	...	...	38·5	...	...	17·5	...	...	47·9	..	...	16·0	...	...	31·5	...	...	22·2

Ages.	NORTH-WESTERN.						NORTH-EASTERN.						BROOK.						NORTHERN.						GORE FARM.					
	Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.			Recoveries.			Deaths.		
	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.	Number of Cases.	Number of Days.	Average.
Under 1	1	6	6·0	2	54	27·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to 2	2	74	37·0	4	59	14·7	1	49	49·0	1	10	10·0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ,, 3	5	278	55·6	3	35	11·6	2	127	63·5	...	...	...	1	101	101·0	1	17	17·0	...	...	...	...	...	...	...	...	...	...	...	...
3 ,, 4	14	675	48·2	...	...	...	7	485	69·2	...	...	...	2	175	87·5	...	...	...	3	246	82·0	...	...	...	...	...	...	...	...	...
4 ,, 5	16	562	35·1	5	151	30·2	8	535	66·8	1	12	12·0	2	110	55·0	...	...	...	5	374	74·8	...	...	...	1	102	102·0	...	...	...
5 ,, 10	33	1,463	44·3	4	27	6·7	16	825	51·5	...	...	...	10	650	65·0	1	38	38·0	16	1,200	75·0	...	...	...	8	491	61·3	...	...	...
10 ,, 15	15	392	26·1	1	21	21·0	14	770	55·0	...	...	...	5	288	57·6	...	...	...	8	526	65·7	...	...	...	...	...	...	...	...	...
15 ,, 20	9	179	19·8	...	...	...	3	172	57·3	...	...	...	8	273	34·1	...	...	...	6	303	50·5	...	...	...	...	...	...	...	...	...
20 and upwards	29	674	23·2	...	...	...	2	58	29·0	...	...	...	7	182	26·0	...	...	...	3	63	21·0	...	...	...	...	...	...	...	...	...
Total	124	4,303	...	19	347	...	53	3,021	...	2	22	...	35	1,779	...	2	55	...	41	2,712	...	...	...	...	9	593	...	...	...	...
Average number of Days in Hospital	...	...	34·7	...	...	18·2	...	...	57·0	...	...	11·0	...	...	50·8	...	..	27·5	...	...	66·1	...	...	0·0	...	...	65·8	...	...	0·0

TABLE XLVA.—Detailed List of Fatal cases in which Diphtheria bacilli were found and which were injected with Antitoxic Serum.

1895.

	FOUNTAIN.	Days in Hospital.
	Under 1	
	O.	4
	Broncho-pneumonia and regurgitation	7
	1 to 2	
T.	Broncho-pneumonia ...	36 and 38
T.	Stridor	4
T.	Mastoiditis and Broncho-pneumonia	41
T.	Pneumonia and adenitis ...	22
H.	... ...	30
	Broncho-pneumonia ...	2
	2 to 3	
T.	Broncho-pneumonia ...	44
H.	Croupy	2
	O.	7
	Cardiac failure	8 and 12
	Nephritis	3
	Recession	2
	Petechiæ	9
	Broncho-pneumonia ...	4
	Varicella, stridulous breathing	75
	Regurgitation and otorrhœa	22
	3 to 4	
T.	Regurgitation	4
T.	Broncho-pneumonia ...	3 and 147
H.	... ...	2
	O.	3 and 4
	Broncho-pneumonia ...	8
	Cardiac failure	6, 6, 6, 11, 34
	Cardiac, irregular, & anuria	8
	Moribund	2
	Laryngeal cough	2
	Epistaxis	6
	4 to 5	
T.	Stridor	3
T.	Broncho-pneumonia ...	3
H.	Urine scanty	4
	O.	3 and 4
	Cardiac failure	11
	Laryngeal stridor	13
	5 to 10	
T.	... ...	27
H.	... ...	4 and 5
H.	Broncho-pneumonia ...	2
H.	Nephritis	4
H.	Moribund	6
H.	Epistaxis	5 and 10
	Cardiac failure	6, 7, & 10
	Cardiac paralysis	34
	Syncope	2
	Strabismus, rickets... ...	7
	Septic antitoxin rash ...	12
	Nephritis, epistaxis ...	6
	Convulsions	7
	Epistaxis	5 and 5
	Adenitis, epistaxis	4
	Adenitis	12 and 32
	Wasting	36
	Anuria	10
	Cardiac failure and nephritis	13
	Cardiac failure and anuria	5 and 6
	Cardiac failure and broncho-pneumonia	6
	10 to 15	
	Cardiac failure	13
	Delirious	5
	15 to 20	
	Septic broncho-pneumonia	7
	Broncho-pneumonia and nephritis	32

	WESTERN.	Days in Hospital.
	Under 1	
T.	... ...	2
	Pneumonia	8
	1 to 2	
T.	... ...	8 and 11
	Adenitis	24
	Paralysis of palate... ...	7
	Lobar pneumonia	12
	Epistaxis	4 and 10
	Necrotic stomatitis... ...	24
	Pneumonia	52
	Broncho-pneumonia ...	28
	Asphyxia after vomiting ...	63
	Anuria	4
	2 to 3	
T.	... ...	21
T.	Pneumonia and nephritis...	86
H.	... ...	5
	O.	6
	Adenitis	3
	Laryngitis, intubation ...	25
	Broncho-pneumonia ...	6
	Adenitis, epistaxis ...	14
	General paresis	38
	Epistaxis	3
	Laryngeal paresis	29
	3 to 4	
T.	... ...	1, 2, 3
T.	Regurgitation	14
	O.	1, 1, 2, 8, 11, 20
	Adenitis	3
	Cardio-gastric crisis ...	2, 7, 9, 17
	Cardiac failure	7 and 36
	Tonsillitis, cellulitis ...	13
	Collapsed	12
	Epistaxis	10
	Pertussis, paralysis of palate	22
	Paralysis of palate... ...	21
	4 to 5	
T.	... ...	2 and 43
H.	... ...	4
	O.	1 and 2
	Adenitis	3
	Epistaxis	6 and 6
	Adenitis, intubation ...	2 and 7
	Cardio-gastric crisis ...	4, 9, 13
	Epistaxis and adenitis ...	9
	Nephritis and epistaxis ...	6
	Laryngeal paralysis ...	27
	Epilepsy	4
	Cardiac failure	2, 6, 19
	Pneumonia	5
	Otitis and scarlet fever ...	19
	5 to 10	
T.	Nephritis, uræmia	14
T.	Pharyngeal paresis... ...	23
T.	Epistaxis	5
T.	Pulmonary thrombosis ...	2
H.	... ...	2, 4, 5, 8, 10
H.	Cardiac failure	5
H.	Epistaxis	6
	O.	2, 5, 5, 8, 10, 18
	Otitis...	24
	Jaundice, convulsions ...	41
	Laryngeal paralysis ...	20
	Broncho-pneumonia ...	14
	Cardiac failure	9, 9, 13, 14, 16
	Septic pneumonia	20
	Cardio-gastric crisis ...	8, 10
	Nephritis and broncho-pneumonia	37
	Epistaxis	4, 4
	Uræmia	6
	Paralysis of palate	5
	Adenitis	4 and 25

	WESTERN.	Days in Hospital.
	10 to 15	
	O.	6 and 12
	Cardio-gastric crisis ...	7
	Epistaxis	3
	Cardio-gastric crisis and pericarditis	10
	15 to 20	
	O.	4
	Cardiac dilatation & nephritis	20

	EASTERN.	Days in Hospital.
	Under 1	
T.	Dyspnœa	52
	Bronchitis	4
	Neck swollen	3
	Convulsions	19
	1 to 2	
T.	Broncho-pneumonia ...	2 and 26
T.	Convulsions	15
T	Croup	18
T.	Bronchitis	20 and 31
	O.	2 and 6
	Croup, paralysis of palate...	16 and 65
	Bronchitis	2
	Broncho-pneumonia ...	5 and 6
	Croup	8, 20, 21
	Convulsions...	9
	Pneumonia	4 and 26
	Pleurisy	25
	2 to 3	
T.	... ...	2
T.	Pneumonia	19
T.	Morbilli	78
T.	Croup	77
	Anuria	6
	Croup	2
	Regurgitation	44
	3 to 4	
T.	Croup	10
T.	Broncho-pneumonia ...	29
T.	Bronchitis	17, 34, 54
	O.	1
	Croup and anuria	35
	Convulsions	16
	Anuria	3
	Epistaxis	4
	Cardiac failure	15
	Paralysis of palate... ...	11
	Otorrhœa	7
	Anuria (partial)	11 and 19
	Vomiting	13
	4 to 5	
T.	Meningitis	18
T. H	... ...	2
H.	... ...	1
	O.	2 and 13
	Pneumonia	7
	Anuria (partial) ...	4, 10, 43
	Bronchitis	14 and 87
	Anuria	2
	Croup	11
	Lobar pneumonia	6
	Convulsions... ..	11
	Morbus cordis ...	10
	Paralysis of palate & anuria	8
	5 to 10	
T.	Croup	6
T.	Septic pneumonia	11
T.	Croupous pneumonia ..	21
H.	.. ..	3 and 4
H.	Epistaxis	6
	O	2, 2, 3, 6

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVA. (*continued*).—Detailed List of Fatal cases in which Diphtheria bacilli were found and which were injected with Antitoxic Serum.

1895—*continued.*

	EASTERN.	Days in Hospital.
	5 to 10—*continued.*	
	Croup and epistaxis ...	3
	Herpes labialis and partial anuria	10
	Paralysis of palate & rhinitis	8
	Anuria	2 and 4
	Epistaxis	6 and 6
	Nephritis	53
	Paralysis of palate... ...	9, 12, 14, 15, 23, 36
	Scarlet fever	22
	Vomiting	2
	Bronchitis	19
	Croup	6, 9, 12
	Septic pneumonia	53
	Broncho-pneumonia ..	7
	10 to 15	
T.	... ...	3
H	... ...	3
H.	Croup	7
	Nephritis	86
	Anuria	3 and 3

	SOUTH-EASTERN.	Days in Hospital.
	Under 1	
	O.	9
	Cardiac paralysis	33
	Broncho-pneumonia ...	32
	1 to 2	
T.	Broncho-pneumonia ...	1, 3, 5
T.	Enteric fever	54
T.	Stridor and retraction ...	2
T.	Bronchitis	6
	Cardiac paralysis	11 and 22
	Broncho-pneumonia ...	20 and 36
	Moribund	2
	Old nephritis	18
	Epistaxis	2
	2 to 3	
T.	Broncho-pneumonia convulsions	6
T.	Stridor	7
T.	Paralysis of palate & stridor	34
	O.	4
	Broncho-pneumonia ...	2 and 34
	Dysphagia	31
	Epistaxis	5
	Regurgitation and retraction	8
	Morbilli and broncho-pneumonia	90
	Cardiac paralysis	8
	Regurgitation and epistaxis	26
	3 to 4	
T.	Stridor and retraction ...	2 and 3
T.H	... ...	2
T.	Morbilli and broncho-pneumonia	80
H.	Paralysis of palate... ...	6
H.	Epistaxis	7 and 8
	Regurgitation	7
	Paralysis of palate and regurgitation	7
	Cardiac paralysis	51
	4 to 5	
T.	... ...	2
T.	Anuria	5
T.	Paralysis of diaphragm ...	39
T.	Broncho-pneumonia ...	1
H.	... ...	2, 2, 2, 2, 3
H.	Strabismus	5
H.	Anuria	6
H.	Epistaxis	3
	Cellulitis and regurgitation	2
	Paralysis of palate	13
	Cardiac paralysis	5
	Broncho-pneumonia ...	24
	Laryngeal dyspnœa ...	4
	Nephritis	7

	SOUTH-EASTERN.	Days in Hospital.
	5 to 10	
T.	Measles	3
T.	Dyspnœa	4
T.	... ...	10
H.	Anæmia	5
H.	... ...	2, 2, 2, 3, 4, 5
H.	Regurgitation	7
H.	Epistaxis	4, 4, 5
H.	Cardiac paralysis	7
H.	Urine scanty	6
	O	[illegible], 4, 6, 8, 10
	Cellulitis and epistaxis ...	6
	Cardiac paralysis	8, 9, 11, 1[illegible]
	Cardiac failure	7
	Paralysis of palate ...	4, 7, 20
	Epistaxis	7
	Nephritis	9
	Broncho-pneumonia ...	31
	Paralysis of palate & pharynx	22
	Otorrhœa and strabismus ...	35
	Constant vomiting	3
	Stridor	2
	10 to 15	
H.	Epistaxis	7
	O.	51
	Cardiac paralysis	8 and 9
	Cardiac failure ...	6
	Nephritis and pleurisy ...	78

	SOUTH-WESTERN.	Days in Hospital.
	Under 1	
T.	Laryngeal	5
	O.	6 and 6
	1 to 2	
T.	Scarlet fever	6
T.	Regurgitation	7
	O.	1, 2, 3, 3, 9
	Broncho-pneumonia ...	3, 8, 8
	Paralysis of diaphragm ...	31
	Bronchitis	10
	Cardiac failure	7
	Measles and broncho-pneumonia	35
	2 to 3	
T.	... ...	3
	O.	2, 2, 2, 12, 14, 24
	Epistaxis	4 and 6
	Broncho-pneumonia ...	8
	Constant vomiting	4
	Collapsed	13
	Bronchitis	39
	3 to 4	
T.	Regurgitation	12
	O.	3, 6, 11, 12
	Epistaxis	12
	Hemiplegia, meningitis ...	114
	4 to 5	
T.	... ...	2, 3, 5
T.	Broncho-pneumonia ...	15
	O.	4, 7, 8
	Cardiac failure	8, 10, 12
	Cardiac failure and paralysis of diaphragm	44
	Broncho-pneumonia ...	2 and 3
	Paralysis of palate	20
	Cardiac failure and paralysis of palate	15
	Nephritis	40
	General paresis	42
	Epistaxis	5 and 8

	SOUTH-WESTERN.	Days in Hospital.
	5 to 10	
T.	... ...	3
T.	Lumbar abscess	19
H.	... ...	3
H.	Cardiac failure	2 and 4
H.	Epistaxis	5
	O.	2, 3, 5, 5, 5, 6, 11, 13
	Cardiac failure	6, 9, 9, 9
	Cardiac failure and epistaxis	8 and 8
	Cardiac failure and scarlet fever	15
	Convulsions	14
	Paralysis of palate	17
	Cardiac action weak ..	29
	Collapsed	15
	Broncho-pneumonia ..	44
	Epistaxis	10
	10 to 15	
T.	... ...	6
	O.	6 and 9
	Cardiac failure	8, 11, 12
	15 to 20	
	Regurgitation	14
	20 and upwards	
	Moribund	2
	Cardiac failure	8

	NORTH-WESTERN.	Days in Hospital.
	Under 1	
	O.	4
	Nephritis	10
	Abdominal abscess	9
	Anuria	6
	1 to 2	
T.	... ...	2
T.	Paralysis of palate	20
	O.	5, 8, 9
	Broncho-pneumonia ..	3, 8, 20, 21
	Croup	1, 4, and 6
	Cardiac failure	47
	Anuria	4 and 14
	2 to 3	
T.	Stridor	5
	Epistaxis	2, 2, 3
	Adenitis, anuria	5
	Syphilis	5
	Broncho-pneumonia ...	46
	Cardiac failure	29
	3 to 4	
T.	... ...	2
	O.	3, 3, 4, 5
	Adenitis	1 and 3
	Stridor	2
	Convulsions	5
	Epistaxis	3, 5, 5, 6
	Paralysis of diaphragm ..	36
	Adenitis and regurgitation	12
	Broncho-pneumonia ..	4
	Morbilli	22
	Delirium	9
	4 to 5	
T.	... ...	2
H.	Rachitis and anuria ...	3
	O.	4 and 15
	Cardiac failure	7 and 13
	Epistaxis	2, 5, 8, 62
	Infantile diarrhœa	4
	Gangrene, lower lobes of lungs	25
	Adenitis	3

T Trachaotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVA. (*continued*).—Detailed List of Fatal cases in which Diphtheria bacilli were found and which were injected with Antitoxic Serum.

1895—*continued.*

	NORTH-WESTERN.	Days in Hospital.
	5 to 10	
H.	Nephritis	6
	O.	3, 5
	Adenitis	2, 3, 11, 21, 41
	Anuria	2, 4, 7, 10
	Cardiac failure	8
	Syncope	5
	Convulsions...	5
	Epistaxis	4 and 5
	Moribund	2
	Regurgitation and cervical abscess	25

	NORTH-WESTERN.	Days in Hospital.
	10 to 15	
	Adenitis	4
	Epistaxis	4
	Broncho-pneumonia ...	15
	Anuria	7
	Cardiac failure	10
	15 to 20	
	Moribund	2
	Paralysis of palate	2
	20 and upwards	
	Moribund	2

	NORTHERN.	Days in Hospital.
	3 to 4	
	Laryngeal stridor	33
	4 to 5	
T.	Broncho-pneumonia ...	34
	Otorrhœa	60
	5 to 10	
	Croup, laryngeal stridor ...	46
	Scarlet fever	17

1896.

	FOUNTAIN.	Days in Hospital.
	1 to 2	
H.	Rhinorrhœa...	4
	O.	12, 12, 6
	Stridor, cough	6
	Rhinorrhœa and broncho-pneumonia	4
	Vomiting	8
	Adenitis	24
	Broncho-pneumonia ...	4, 17
	Collapsed	2, 7, 4
	Otorrhœa	8, 13
	Epistaxis	10
	Moribund	7
	Cardiac failure	5
	Stridor, adenitis	28
	2 to 3	
T.	... ...	5
T.	Convulsions...	4
H.	... ...	7
	O.	3, 4, 6
	Rhinorrhœa...	4
	Broncho-pneumonia ...	17
	Œdema of lids, anuria ...	9
	Collapsed, dyspnœa ...	40
	Collapsed	11
	Epistaxis	25
	Pharyngeal paralysis and epistaxis	44
	Pharyngeal paralysis and broncho-pneumonia ...	67
	3 to 4	
T.	Croupy	2
T.	Stridor and moribund ...	5
H.	... ...	3
H.	Epistaxis, otorrhœa ...	8
H.	Epistaxis and moribund ...	2
	Moribund, adenitis ...	25
	Epistaxis, angina	8
	Rhinorrhœa	3
	Otorrhœa and rhinorrhœa...	31
	Regurgitation	12
	Died before operation ...	2
	Broncho-pneumonia ...	75, 9
	Stridor and recession ...	6
	Broncho-pneumonia&stridor	3
	Otorrhœa	9
	Urine scanty	9, 8, 12
	Epistaxis	4, 5
	Cardiac action feeble ...	30
	Septic pneumonia	10
	Cervical cellulitis	7, 8
	Adenitis, delirium	9
	Diarrhœa and regurgitation	15
	Adenitis, bronchitis, and convulsions	70
	4 to 5	
T.	... ...	6
T.	Epistaxis and regurgitation	18
T.	Bronchial obstruction ...	52
H.	... ...	2, 5, 7

	FOUNTAIN.	Days in Hospital.
	4 to 5—*continued.*	
H.	Constant vomiting	6
	O.	5, 5, 5, 6, 7
	Rhinorrhœa	51
	No pulse	11
	Otorrhœa, adenitis, and convulsions	17
	Diarrhœa and scarlet fever	49
	Collapsed	6
	Stomatitis and bronchitis ...	22
	Pulse slow	7
	Pulse rapid	22
	P.M. membrane in trachea	7
	Congested pharynx... ...	4
	Otorrhœa	10
	5 to 10	
T.	Blood in trachea	6
T.	Rhinorrhœa	4
H.	... ...	4, 5, 6, 6
H.	Epistaxis	3, 3, 7, 7, 9, 12
H.	Convulsions	10
H.	Rhinorrhœa	13
H.	Diarrhœa	3
H.	Urine scanty	6
H.	Rejects enemata	7
H.	Cardiac action erratic ...	12
	O.	5, 7, 7, 8, 11, 12
	Epistaxis	5, 6, 7, 7
	Collapsed	4, 7
	Anuria	5, 5
	Septic pneumonia	27
	Adenitis	11, 20
	Moribund	2
	Cardiac failure	10
	Cardiac action feeble ...	8
	Cardiac failure	29
	Cardiac action feeble, and paralysis of palate ...	21
	Œdema of eyelids	10
	Rhinorrhœa	2
	Palate (membrane)... ...	11
	Bronchitis and scarlet fever	40
	Pulse slow	11
	Cellulitis	14
	No pulse	3
	Pulse feeble...	5, 6
	Delirium	2
	Bruising, site of injection...	6
	Regurgitation	8
	Diarrhœa	14
	Paralysis of palate	16
	10 to 15	
H.	... ...	9
	O.	4, 11
	Adenitis	9
	Cardiac action irregular ...	13
	Delirium	5
	20 and upwards	
	Cellulitis of neck	13

	WESTERN.	Days in Hospital.
	Under 1	
T.	Regurgitation	3
	O.	26
	Regurgitation	6
	Cardiac failureand epistaxis	21
	Laryngeal obstruction and varicella...	16
	1 to 2	
T.	... ...	3
T.	Moribund	2
T.	Broncho-pneumonia ...	36
T.	Lobar pneumonia	30
T.	Epistaxis	3
T.	General paralysis and lobar pneumonia	22
T.	Bronchial obstruction ...	2
	O.	4,5,5,18,20
	Epistaxis	6, 7, 10
	Broncho-pneumonia ...	5, 74, 90
	General bronchitis	15
	Morbilli and bronchitis ...	51
	Stomatitis and bronchitis ...	43
	Ecchymosis at site of antitoxic serum injection ...	25
	2 to 3	
T.	... ...	2, 3, 4, 8
T.	Broncho-pneumonia ...	34, 61
T.	Laryngeal stridor	2
T.	Broncho - pneumonia and asphyxia...	14
H.	Cardiac failure	11
H.	Epistaxis	5
H.	Vomiting	5
	O.	6, 11
	Broncho-pneumonia ...	2, 34, 35
	Septicæmia	30
	Epistaxis	4
	Vomiting	2
	Convulsions	11
	Stridor	2
	Regurgitation	7
	Cardiac action slow ...	6
	General paralysis and cardiac failure	39
	Septicæmia	21
	Moribund	2 and 2
	3 to 4	
T.	... ...	2
H.	Epistaxis	7
	O.	4,5,6,19,36
	Lobar pneumonia	9, 11
	Broncho-pneumonia ...	8, 22
	Regurgitation and epistaxis	6, 24
	Epistaxis	3
	Cardiac failure and epistaxis	6
	Otorrhœa	34
	Moribund	2
	Cardiac sounds inaudible ...	11
	Cardiac failure	8
H.	Petechial hæmorrhage ...	6
	Vomiting	10
	Pharyngeal paralysis & rickets	48

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVA. (*continued*).—Detailed List of Fatal cases in which Diphtheria bacilli were found and which were injected with Antitoxic Serum.

1896—*continued*.

	WESTERN.	Days in Hospital.
	4 to 5	
T.	... ...	4, 4
T.	Otorrhœa	4
T.	Broncho-pneumonia ...	22, 43
H.	Epistaxis	3, 6
H.	Paralysis of pharynx ...	15
	O.	3,4,8,26,28
	Cardio-gastric crisis ...	7, 8, 10
	Epistaxis	4, 18
	Regurgitation	15
	Paralysis of palate ...	10, 10
	Broncho-pneumonia ...	45
	Pertussis	2
	Arthralgia	13
	Rhinitis	5
	Superficial necrosis ...	10
	Cardiac sounds abrupt ...	30
	Otorrhœa	9
	Rhinorrhœa	6
	Cardiac failure	3
	5 to 10	
T.	... ...	4, 20, 23
T.	Lobar pneumonia	21
T.	Nephritis	60
T.	Epistaxis	9
T.	Moribund	3
H.T.	... ...	4
H.	... ...	4, 4, 5, 5, 7
H.	Epistaxis	3, 5, 7
H.	and cardiac failure... ...	3
H.	Bruising at site of injection	2
H.	Constant vomiting	4
	O.	7
	Epistaxis	3, 11, 27, 33
	Adenitis	10
	Adenitis and scarlet fever...	33
	Anorexia	12
	Cardio-gastric crisis ...	6, 8
	Moribund	2
	Paralysis of palate	2, 17
	Cardiac failure	19
	Morbus cordis	18
	Dyspnœa	3
	Cardiac action cantering ...	9
	Pulseless	1
	Constant vomiting	6
	Collapsed	1
	10 to 15	
H.	... ...	5
	Cardio-gastric crisis ...	9, 11
	Broncho-pneumonia ...	5
	Paralysis of palate ...	8
	Regurgitation	12
	Paralysis of pharynx ...	23
	15 to 20	
	Gangrenous stomatitis ...	4
	Cardiac failure	45

	EASTERN.	Days in Hospital.
	Under 1	
	Cardiac failure	2, 5
	1 to 2	
	O.	11
	Partial anuria	10
	Broncho-pneumonia ...	19
	Cardiac failure	7
	2 to 3	
T.	Bronchitis	49
T.	Regurgitation	11
	Cardiac failure	13
	Cardiac action galloping ...	11
	Bronchitis	15
	Broncho-pneumonia ...	2, 94
	Anuria	2, 4
	Urine scanty	7, 9
	Vomiting and collapse ...	20
	Dyspnœa	4

	EASTERN.	Days in Hospital.
	3 to 4	
T.	Dyspnœa	27
T.	Urine scanty	89
H.	... ...	1
	O	4
	Anuria	3, 5, 8, 12, 20
	Epistaxis	3, 9
	Moribund	2
	Vomiting	5
	Paralysis of diaphragm ...	44
	Paralysis of palate	2
	Moribund, cardiac failure...	2
	Nephritis	15
	Convulsions	13
	4 to 5	
T.	... ...	3, 3
T.	Dyspnœa	31
H.	Epistaxis	5, 7
	Epistaxis	3, 4, 11
	Urine scanty	5
	Broncho-pneumonia ...	24
	Pneumonia	35
	Nephritis	18
	Cyanosis	2
	Anuria	4
	Cardiac failure	10 and 37
	Morbilli	3
	Partial anuria	13
	Otorrhœa	14
	Croupy	12
	5 to 10	
T.	Broncho-pneumonia ...	2
H.	... ...	3, 4, 5
H.	Anuria	4 and 6
H.	Epistaxis	7, 7, 8, 13
H.	Convulsions	11
	Delirium	2
	Anuria	4, 5, 7, 8
	Convulsions...	8, 21
	Urine scanty	3, 5, 10
	Epistaxis	3, 9, 10
	Regurgitation	3, 7
	Dyspnœa, uræmia	16
	Constant vomiting	9
	Cervical adenitis	9
	Paralysis of rectum ...	44
	Alveolar abscess	2
	Broncho-pneumonia ...	42
	Anuria and epistaxis ...	9
	Cardiac failure	11
	Morbilli	48
	Pleurisy	13
	Paralysis of palate... ...	26

	SOUTH-EASTERN.	Days in Hospital.
	Under 1	
T.	Measles	6
	Moribund	2
	Cardiac paralysis	18
	Conjunctivitis	5
	Constant vomiting	4
	Diarrhœa	8
	Retraction of chest... ...	4
	1 to 2	
T.	... ...	1
T.	Laryngeal cough	40
T.	Bronchitis	28
T.	Broncho-pneumonia ...	6
T.	Regurgitation	16
T.	Stridor	4
H.	... ...	2
	O.	4 and 6
	Broncho-pneumonia ...	7, 40
	Paralysis of pharynx ...	4
	Otorrhœa, strabismus ...	44
	Glands swollen	9
	Convulsions	19

	SOUTH-EASTERN.	Days in Hospital.
	2 to 3	
T.	... ...	4
T.	Epistaxis	4
T.	Broncho-pneumonia ...	2
T.	Dyspnœa	5
H.	... ...	5
H.	Epistaxis	6
H.	Morbilli, cyanosis	47
H.	Bronchitis	6
	O.	4 and 6
	Constant vomiting	7
	Epistaxis	4
	Regurgitation and epistaxis	5 and 42
	Otorrhœa	20
	3 to 4	
T.	Dyspnœa	1
T.	Epistaxis	14
H.	... ...	3
H.	Constant vomiting	5
H.	Cardiac paralysis	10
H.	Anuria	9
	O.	5
	Constant vomiting	4
	Adenitis	1
	Epistaxis and regurgitation	5
	Broncho-pneumonia ...	69
	Epistaxis	5 and 6
	Anæmia	8
	Fed by nose...	4
	Cyanosis	2
	Fed by nose, retraction ...	25
	Collapsed (pulse 100) ...	1
	Moribund	1 and 2
	4 to 5	
T.	Morbilli	1
H.	... ...	1, 2, 2
H.	Epistaxis	5
	O.	7
	Anæmia	19
	Otorrhœa	7
	Convulsions...	10, 41
	Cyanosis and epistaxis ...	40
	5 to 10	
T.H.	... ...	2
T.	Cyanosis	3
T.	Regurgitation	39
H.	... ...	2
H.	Vomiting	5 and 29
	O.	3, 8, 11
	Epistaxis	3, 9, 10
	Adenitis and anuria ...	10
	Pleurisy	3
	Conjunctivitis	36
	Epistaxis and anuria ...	5
	Epistaxis and regurgitation	18
	Constant vomiting	5, 5, 6, 6, 14, 25
	Bruises on right cheek ...	8
	Cardiac failure	2
	Cardiac paralysis	6, 6, 13, 53
	Cardiac dilatation	101
	Regurgitation	6
	Morbilli	39
	10 to 15	
T.	... ...	2
H.	... ...	2
H.	Constant vomiting	3
	Collapsed	14
	Cardiac paralysis	5 and 7
	Epistaxis	17
	15 to 20	
	Regurgitation	11
	Cardiac paralysis	12
	20 and upwards	
	O.	5
	Cardiac failure	2

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained

TABLE XLVA. (*continued*).—Detailed List of Fatal cases in which Diphtheria bacilli were found and which were injected with Antitoxic Serum.

1896—*continued.*

	SOUTH-WESTERN.	Days in Hospital.
	Under 1	
	O.	2 and 3
	1 to 2	
T.	Bronchitis	6 and 9
T.	Broncho-pneumonia ...	10
	Moribund	3
	Adenitis and epistaxis ...	12
	2 to 3	
T.	Broncho-pneumonia ...	3
T.	Scarlet fever	14
	Moribund	2
	Cardiac failure	9
	Regurgitation	8
	Epistaxis	4
	3 to 4	
T.H	Cyanosis	2
T.	Respiration jerky	5
H	Epistaxis	6
	Laryngeal paralysis ...	49
	4 to 5	
T.	... ...	7
T.	Cardiac failure	8
H.	Blood in urine	11
	Scarlet fever	8
	Epistaxis	6 and 8
	Cardiac failure	2
	Cardio-gastric crisis ...	13
	5 to 10	
T.	... ...	1 and 5
T.	Cardiac failure	3
H.	... ...	3 and 4
H.	Cardiac failure	6 and 7
H.	Epistaxis and adenitis ...	4
	O.	3, 5, 6, 8, 8, 8, 8, 13
	Cardiac failure	2, 8, 9, 11, 12, 44, 49
	Epistaxis	4, 4, 4, 8, 11, 14
	Laryngeal cough	8
	Otorrhœa	4
	Oozing of blood from mouth	20
	Vomiting (P.M. fatty heart)	2
	Delirium	3
	Abdominal pains	35
	Paralysis of palate	6
	Moribund	1 and 2
	10 to 15	
H.	Cardiac failure	7
	O.	23
	Cardiac failure	9 and 41
	Regurgitation	16
	15 to 20	
	Œdema, right eyelid ...	8

	NORTH-WESTERN.	Days in Hospital.
	Under 1	
	Stridor and retraction ...	2
	Broncho-pneumonia ...	39
	1 to 2	
T.	Anuria	3
	O.	4 and 13
	Lobar pneumonia	14
	Double adenitis	5
	Starvation	3
	Varicella and adenitis ...	66
	Croup	4
	Adenitis	2 and 7
	Cardiac action "tic-tac" .	2
	Bronchitis	35
	Broncho-pneumonia ...	9
	2 to 3	
T.	... ...	1
H.	Epistaxis	6
	O.	7
	Cardiac failure	2, 8, 8
	Stridor and retraction ...	7
	Anuria	4 and 10
	Respiration rapid	4
	Cardiac dilatation	10
	Bull neck	5
	Stridor, urine scanty ...	2
	Moribund	2
	3 to 4	
T.	... ...	3
T.	Bronchitis	44
	Cardiac failure	3
	Cardiac failure and anuria	16
	Cardiac failure and adenitis	9 and 9
	Cardiac failure & convulsions	15
	Otorrhœa and anuria ...	12
	Bronchitis	3 and 38
	Epistaxis and anuria ...	9
	Adenitis	4
	Pyrexia	9
	Moribund	2
	Adenitis and anuria ...	2
	Epistaxis	5
	Morbilli and coryza ...	24
	Anuria	5
	4 to 5	
T.	Moribund	2
T.	Retraction	6
T.	Stridor	2
H.	... ...	6
H.	Cardiac failure	3
	Anuria	3, 7, 10
	Laryngeal cough	12
	Cardiac failure	7, 8, 13
	Double adenitis	12
	Respiration rapid	5
	Adenitis and anuria ...	3 and 11
	Convulsions	4
	Cardiac dilatation	10
	Paralysis of larynx ...	44
	Cardiac paralysis	7
	Epistaxis	2
	Paralysis, pharyngeal muscles	39
	Adenitis, epistaxis, & anuria	9
	5 to 10	
T.	... ...	4
T.	Stridor and retraction ...	2
H.	Hæmorrhagic neck... ...	47
H.	Anuria	7
H.	Epistaxis	5
H.	Urine scanty	7
	Anuria	2, 6, 6, 10
	Double adenitis	5 and 61
	Adenitis and anuria ...	2, 4, 4, 8, 8, 8, 7, 7, 16, 58
	Cardiac failure	5, 8, 8, 9, 10, 11, 11, 11, 12, 12, 45
	Paralytic cough	41
	Delirium	9 and 9
	Faucial paralysis and anuria	5
	Nausea	85
	Convulsions	7
	Adenitis	3 and 7
	Moribund	2 and 6
	Epistaxis	10 and 62
	Paralysis of palate ...	65
	Cardiac dilatation	12 and 24
	Septicæmia	8
	Membrane, nose	10
	Cardiac "dulness" ...	3
	10 to 15	
T.	Convulsions	2
	Regurgitation	43

	NORTH-EASTERN.	Days in Hospital.
	1 to 2	
T.	Broncho-pneumonia ...	47
	2 to 3	
T.	Paralysis diaphragmitis ...	75
	4 to 5	
	Urine scanty	4
	5 to 10	
	O.	50
	Urine scanty	13
	Ophthalmia	11
	10 to 15	
T.	Otorrhœa	77

	BROOK.	Days in Hospital.
	Under 1	
	Broncho-pneumonia ...	8
	1 to 2	
T.	Emphysema	2
T.	Cardiac failure	5
	Urine scanty	8
	Laryngeal stridor	13
	Cardiac failure	4 and 48
	2 to 3	
T.	Retraction of ribs	6
	Bronchitis	98
	3 to 4	
T.	Epistaxis	6
	O.	2, 2
	Cardiac dilatation	15
	Cardiac paralysis	11
	4 to 5	
T.	Epistaxis	43
	O.	8
	Cardiac failure	3 and 4
	Cardiac paralysis	11
	Sores on lips	6
	Heart dilated	37
	Heart action cantering ...	3
	5 to 10	
H.	Epistaxis	2
	O.	1, 8, 50
	Epistaxis	3 and 6
	Anuria	12
	Regurgitation	37
	Moribund	1
	Convulsions	5
	Cardiac failure	13, 17, 22
	Heart dilated	37 and 44
	Cardiac paralysis	4
	Stridor and bronchitis ...	10
	10 to 15	
	Cardiac failure	9

	NORTHERN.	Days in Hospital.
	3 to 4	
	Convalescent scarlet fever	15
	5 to 10	
	O.	60
	Convalescent scarlet fever...	18

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVIA.—Detailed List of Fatal cases in which Diphtheria bacilli were found but which were not injected with Antitoxic Serum.

1895.

	FOUNTAIN.	Days in Hospital.
	Under 1	
	Diarrhœa, broncho-pneumonia	14
	Otorrhœa	10
	1 to 2	
T.	...	3
	Cardiac failure	7
	Stridor	2 and 2
	Broncho-pneumonia	7
	Morbus cordis	5
	2 to 3	
T.	Nephritis	9
H.	Regurgitation	3
	O.	7 and 9
	Adenitis, diarrhœa	38
	Broncho-pneumonia	3, 5, & 23
	Epistaxis	5
	Septic rash	11
	3 to 4	
T.	...	3
	O.	3, 7, 17, 17, 33
	Nephritis and cardiac failure	8
	Regurgitation, urine scanty	11
	Urine scanty	10
	Otorrhœa, strabismus	4
	Diarrhœa, rhinorrhœa	39
	Broncho-pneumonia	20
	4 to 5	
	O.	7
	Pneumonia	12
	Otorrhœa	9
	5 to 10	
H.	...	1 and 3
H.	Epistaxis	6
	O.	11 and 13
	Cardiac failure	10 and 17
	Septic pneumonia	4
	Paralysis of pharynx	43
	Otorrhœa	57
	Regurgitation	7
	10 to 15	
H.	...	2
H.	Anuria	11
	15 to 20	
	Nephritis, uræmia	3
	Sudden collapse	9
	20 and upwards	
	Adenitis, epithelioma	22
	Acute bronchitis	23

	WESTERN.	Days in Hospital.
	1 to 2	
	Lobar pneumonia	2
	Conjunctivitis, adenitis	2
	Scarlet fever	25
	2 to 3	
	Paralysis of palate	25
	3 to 4	
H.	...	3
	O.	12
	Anuria	4
	Adenitis	3 and 13
	4 to 5	
	O.	5 and 17
	5 to 10	
	O.	1 and 5
	General paresis	37
	Lobar pneumonia	38

	WESTERN.	Days in Hospital
	10 to 15	
	Cardio-gastric crisis	10
	15 to 20	
	O.	21
	20 and upwards	
	Puerperal septicæmia	1

	EASTERN.	Days in Hospital.
	Under 1	
	Croup	7
	Rhinorrhœa	4
	1 to 2	
T.	...	5
T.	Bronchitis	2
	O.	2
	Broncho-pneumonia	2 and 100
	Gastro-enteritis	53
	Rhinorrhœa	25
	Epistaxis	5
	2 to 3	
T.	Neck swollen	24
	O.	3, 3, 4, 5
	Paralysis of palate	2
	Cardiac failure	3
	Bronchitis	8 and 34
	Varicella	35
	Laryngitis	10
	Rhinorrhœa and vomiting	24
	Nephritis	85
	Paralysis of larynx	34
	Impetigo, blepharitis	6
	3 to 4	
T.	Stridor	10
	Convulsions	5 and 8
	Tubercular peritonitis	7
	Croup	2
	Tubercular meningitis	19
	Paralysis of palate	6
	Pneumonia	17
	Partial anuria	5
	Gastro-enteritis	11
	Vomiting	9
	Cellulitis	8
	4 to 5	
	O.	1, 2, 7
	Partial anuria	3
	Anuria	3, 7, 11
	Cervical adenitis	10
	Morbus cordis	6
	Paralysis of palate	8 and 37
	Pneumonia	3
	Vomiting	7
	5 to 10	
T.	...	3
T.	Croup	6
T.	Pneumonia	3
T.	Stridor	10
T.	Lobar pneumonia	27
H.	...	4 and 5
	O.	2
	Epistaxis	3, 3, 4, 53
	Cardiac failure	3
	Croup	10
	Partial anuria	13 and 43
	Anuria	2, 9, 43
	Nephritis	56
	Paralysis of palate	12 and 37
	Gastro-enteritis	15
	Morbilli	8
	Pyæmia	13
	Cardiac failure	11
	Cellulitis	3
	Otorrhœa	23

	EASTERN.	Days in Hospital.
	10 to 15	
	O.	3
	Cardiac dilatation	32
	Cardiac paralysis	53
	Rheumatism	27
	15 to 20	
	Convulsions	12

	SOUTH-EASTERN.	Days in Hospital.
	1 to 2	
T.	Dyspnœa	1
	2 to 3	
T.	Dyspnœa	1
H.	...	1
	Cardiac paralysis	23
	3 to 4	
	Broncho-pneumonia	26
	5 to 10	
H.	Epistaxis	1
	O.	1 and 2
	Regurgitation	28
	Pericarditis and endocarditis	47

	SOUTH-WESTERN.	Days in Hospital.
	2 to 3	
T.	Bronchitis and otorrhœa	1
	3 to 4	
	Cardiac failure	43
	Collapse	5
	4 to 5	
	O.	9
	5 to 10	
	Cardiac failure	10
	Regurgitation	5
	10 to 15	
	Paralysis of palate	12

	NORTH-WESTERN.	Days in Hospital.
	1 to 2	
T.	...	4
T.	Broncho-pneumonia	8
T.	Cyanosed	1
	Rickets	12
	Meningitis	4
	Broncho-pneumonia	8, 13, 34
	Lobar pneumonia	39
	2 to 3	
T.	...	7
	O.	3, 7
	Paralysis of muscles	44
	Pneumonia	28
	Epistaxis	1 and 3
	Adenitis	27
	Cellulitis of neck & otorrhœa	12
	Adenitis and regurgitation	13
	Broncho-pneumonia	3
	3 to 4	
T.	...	1 and 15
	O.	4 and 6
	Broncho-pneumonia	8 and 35
	Paralysis of muscles	7
	Adenitis and otorrhœa	16
	Measles	3
	Adenitis	2 and 5
	Adenitis and paralytic cough	53
	Enteric fever	61
	Scarlet fever	13

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVIA. (*continued*).—Detailed List of Fatal cases in which Diphtheria bacilli were found but which were not injected with Antitoxic Serum.

1895—*continued.*

	NORTH-WESTERN.	Days in Hospital.
	4 to 5	
T.	...	1
	O.	7 and 9
	Croup	5
	Epistaxis	1 and 3
	Otorrhœa	4 and 6
	Cardiac failure	2
	Epistaxis and adenitis	7
	5 to 10	
T.	...	6
T.	Croup	4
H.	...	4
H.	Adenitis	25
	O.	1, 1, 2, 9
	Moribund	2
	Adenitis	17
	Faucial paralysis	22
	Broncho-pneumonia	34
	Cardiac failure and anuria	7
	Epistaxis	10 and 10
	Cardiac failure	1 and 17
	Otorrhœa	1
	Nephritis and otorrhœa	5
	Adenitis and epistaxis	81
	Pharyngeal paralysis and epistaxis	39
	Scarlet fever	9

	NORTH-WESTERN.	Days in Hospital.
	10 to 15	
	Tuberculosis	2
	Adenitis and epistaxis	4
	Broncho-pneumonia	5

	NORTH-EASTERN.	Days in Hospital.
	1 to 2	
T.	Pneumonia	46
	2 to 3	
T.	...	42
T.	Nephritis	32
T.	Tonsillitis	28
	Broncho-pneumonia	4
	Scarlet fever	43
	Scarlet fever and tonsillitis	28
	Intubation	33
	3 to 4	
T.	...	49
	Nephritis	10

	NORTH-EASTERN.	Days in Hospital.
	4 to 5	
	Scarlet fever	42
	5 to 10	
	Croupy	8
	Tuberculosis	66

	NORTHERN.	Days in Hospital.
	5 to 10	
	Scarlet fever	25

1896.

	FOUNTAIN.	Days in Hospital.
	Under 1	
	Collapsed	3
	Cardiac failure	4
	Otorrhœa, emaciation	60
	1 to 2	
T	...	2
	O.	1 and 6
	Bronchitis	19
	Cyanosed	4
	Collapsed	2
	Moribund, croupy	2
	2 to 3	
	Scarlet fever	4
	Rhinorrhœa	11
	3 to 4	
T.	Collapse, cyanosed	45
	Broncho-pneumonia	4 and 23
	Convulsions	11
	Bronchitis	17
	4 to 5	
	Scarlet fever	2
	Cardiac failure	22
	5 to 10	
H.	Dyspnœa	1
	O.	2
	Rhinorrhœa, jaundice	16
	Cardiac failure	7
	Adenitis, anuria	17
	Anuria	4
	Neck swollen	9

	WESTERN.	Days in Hospital.
	Under 1	
	Moribund	1
	1 to 2	
	Petechial hæmorrhages	1

	WESTERN.	Days in Hospital.
	2 to 3	
H.	Moribund	2
	Broncho-pneumonia	48, 57
	Cardio-gastric crisis	2
	Collapsed	1
	3 to 4	
	Cardio-gastric crisis	8
	Regurgitation, stomatitis	7
	4 to 5	
	O.	3
	Moribund	1
	Otorrhœa, pyæmia	27
	5 to 10	
	O.	2
	10 to 15	
	Cardio-gastric crisis	11
	Heart dilated	2
	Peritonitis, otalgia	33
	15 to 20	
H.	Moribund	4

	EASTERN.	Days in Hospital.
	Under 1	
	Stridor	18
	1 to 2	
	Moribund	2
	Convulsions	58
	2 to 3	
	Anuria	11
	Broncho-pneumonia	16
	Pyæmia, arthritis	12
	3 to 4	
	Heart action cantering	17
	Diarrhœa	6

	EASTERN.	Days in Hospital.
	4 to 5	
	Broncho-pneumonia	17
	5 to 10	
H.	Moribund	1
H.	Vomiting	4
	Endocarditis	6
	Anuria and convulsions	3
	Neck swollen	1
	10 to 15	
	Vomiting	5

	SOUTH-EASTERN.	Days in Hospital.
	Under 1	
	Cyanosis	1
	Pneumonia	64
	1 to 2	
H.	Epistaxis	1
	Bronchitis	11
	Otorrhœa, pyæmia	17
	Morbilli	11
	2 to 3	
H.	...	3
H.	Moribund	1
	O.	5
	Dyspnœa, scarlet fever	19
	Regurgitation, retraction	21
	Morbilli, conjunctivitis	3
	3 to 4	
T.	...	1
H.	Varicella	33
	No pulse	4
	4 to 5	
	O.	1
	Retraction	62
	Adenitis, scarlet fever	7
	Cardiac paralysis	3

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVIA. (*continued*).—Detailed List of Fatal cases in which Diphtheria bacilli were found but which were not injected with Antitoxic Serum.

1896—*continued.*

	SOUTH-EASTERN.	Days in Hospital.
	5 to 10	
H.	Cardiac paralysis	3
	Delirium	2
	Otorrhœa	2
	Cardiac euresis	50
	Paralysis of palate... ...	46

	SOUTH-WESTERN.	Days in Hospital.
	Under 1	
	Acute diarrhœa	4
	1 to 2	
	O.	10
	Cardiac failure	1
	2 to 3	
	O.	5 and 7
	3 to 4	
	Necrosis	3
	Hemiplegia	15
	4 to 5	
	O.	1
	5 to 10	
	O.	7
	Cardiac failure	6

	NORTH-WESTERN.	Days in Hospital
	Under 1	
	Congenital syphilis ..	3
	1 to 2	
T.	... ...	3
T.	Stridor and retraction ...	4
	Moribund	2 and 5
	Convulsions	7 and 24
	Urine scanty	2 and 6
	Epistaxis	5
	Lobar pneumonia	10

	NORTH-WESTERN.	Days in Hospital.
	2 to 3	
	O	3, 13, 35
	Anuria	2
	Moribund	4
	Cardiac failure	17
	Septicæmia	6
	Whooping cough	7
	Congenital syphilis... ...	7
	Morbilli	3
	Adentis and urine scanty ...	3
	Epistaxis	3
	Adenitis	2 and 13
	Urine scanty	4
	Membrane in nose	2
	3 to 4	
T.	... ...	2
	O.	2, 6, 6, 8
	Scarlet fever	4
	Croupy	3 and 8
	Convulsions...	13
	Epistaxis	6
	Anuria	14
	Urine scanty	6 and 17
	Adenitis	11 and 17
	Broncho-pneumonia ...	2
	4 to 5	
T.	Stridor	3
H.	Epistaxis	3
H.	Tonsillitis	55
	O.	3 and 5
	Nephritis	7
	Anuria	2 and 5
	Scarlet fever	8
	Moribund	3
	Stomatitis	22
	Epistaxis	4, 6, 8
	Otorrhœa	4
	Croupy and stridor... ...	1
	Cardiac failure	6
	5 to 10	
T.	... ...	1
T.	Paralysis of palate	4
	Anuria	6 and 11
	Moribund	1, 1, and 3
	Adenitis	2 and 12
	Scarlet fever	13
	Epistaxis	10

	NORTH-WESTERN.	Days in Hospital.
	5 to 10—*continued.*	
	Meningitis	59
	Cardiac failure	7, 8, 8, 9, 23, 35
	Adenitis and anuria ...	9 and 11
	Paralysis of palate... ...	2
	Regurgitation	48
	Cardiac dilatation	9
	Croupy	3
	Adenitis and epistaxis ...	3
	Morbilli	9
	10 to 15	
	Moribund	3
	Adenitis and urine scanty...	60

	NORTH-EASTERN.	Days in Hospital.
	5 to 10	
	Scarlet fever	6
	Panophthalmitis	9

	BROOK.	Days in Hospital.
	4 to 5	
	Cyanosed	9

	NORTHERN.	Days in Hospital.
	5 to 10	
	Convalescent scarlet fever...	46

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVIIA.—Detailed List of Fatal cases in which no Diphtheria bacilli were found but which were injected with Antitoxic Serum.

1895.

	FOUNTAIN.	Days in Hospital.
	1 to 2	
	Broncho-pneumonia ...	2
	Adenitis	5
	3 to 4	
	Otorrhœa	35
	Otorrhœa and regurgitation	39
	5 to 10	
	O.	8

	WESTERN.	Days in Hospital.
	1 to 2	
	Broncho-pneumonia ...	4
	Lobar pneumonia	6
	2 to 3	
	Pneumonia and epistaxis ...	2
	3 to 4	
	O.	4
	Otorrhœa	9
	Broncho-pneumonia ...	10
	20 and upwards	
	Chronic nephritis	21

	EASTERN.	Days in Hospital.
	Under 1	
	O.	30
	Lobar pneumonia	16
	Pneumonia	18
	1 to 2	
T.	Bronchitis	8
	O.	5 and 16
	Bronchitis	8
	Pneumonia	16
	Otorrhœa	4

	EASTERN.	Days in Hospital.
	2 to 3	
	O.	3
	Broncho-pneumonia ...	67
	3 to 4	
T.	Urine scanty	5
	4 to 5	
T.	Broncho-pneumonia ...	41
	O.	18
	5 to 10	
	Gastro-enteritis	13
	O.	9
	Stomatitis	6
	10 to 15	
	O.	2 and 12

	SOUTH-EASTERN.	Days in Hospital.
	2 to 3	
	Septic pneumonia	24
	3 to 4	
	Diarrhœa	50
	4 to 5	
	Broncho-pneumonia ...	7
	5 to 10	
T.	Convulsions, bronchitis ...	4
	10 to 15	
	Paralysis of palate	6 and 17

	SOUTH-WESTERN.	Days in Hospital.
	Under 1	
	Bronchitis	3
T.	Bronchitis	4
	Follicular tonsillitis ...	2
	3 to 4	
	... ...	5
T.	Broncho-pneumonia ...	3
T.	Broncho-pneumonia ...	12 and 17
	4 to 5	
	Regurgitation	5
	5 to 10	
	Cardiac failure	6
	Paralysis of palate	10
	Pulmonary tuberculosis ...	17

	NORTH-WESTERN.	Days in Hospital.
	Under 1	
	Bronchitis	10
	1 to 2	
	Broncho-pneumonia ...	3 and 14
	Pneumonia	5
	Bronchitis and adenitis ...	5
	Measles	13
	2 to 3	
	Broncho-pneumonia ...	10
	3 to 4	
	Moribund	2 and 2
	Broncho-pneumonia ...	26
	4 to 5	
	Broncho-pneumonia ...	33
	5 to 10	
	Urine scanty	38
	20 and upwards	
	Pneumonia	2

1896.

	FOUNTAIN.	Days in Hospital.
	1 to 2	
T.	Diarrhœa	35
	Scarlet fever	2 and 3
	2 to 3	
	Pneumonia	12
	Conjunctivitis	85
	3 to 4	
T.	... ...	2
	Double otorrhœa	8
	Convulsions	17
	Paralysis of palate	4
	Scarlet fever	6 and 8
	Otorrhœa	8
	4 to 5	
	Paralysis of palate	13
	Diarrhœa	19 and 60
	Moribund and anuria ...	30
	Broncho-pneumonia ...	8

	FOUNTAIN.	Days in Hospital.
	5 to 10	
	Paralysis of palate	7
	Epistaxis	10
	Croupy	8
	Moribund delirium ...	16
	Vomiting and diarrhœa ...	19
	Cardiac failure	25
	10 to 15	
	Diarrhœa	14

	WESTERN.	Days in Hospital.
	Under 1	
	Broncho-pneumonia ...	8
	1 to 2	
	Urine scanty	9
	Pyæmia and diarrhœa ...	17
	2 to 3	
	Cardiac failure	5
	Bronchitis	14
	Scarlet fever	7

	WESTERN.	Days in Hospital.
	3 to 4	
	Broncho-pneumonia ...	2
	4 to 5	
	Diarrhœa	53
	Cardiac failure	39
	5 to 10	
T.	... ...	10
H.	Septicæmia	4
H.	Diarrhœa	17
	Toxæmia	7
	20 and upwards	
	Suppurating tonsillitis ...	4

	EASTERN.	Days in Hospital.
	1 to 2	
T.	... ...	6
	Broncho-pneumonia ...	3

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVIIA. (*continued*).—Detailed List of Fatal cases in which no Diphtheria bacilli were found but which were injected with Antitoxic Serum.

1896—*continued.*

	EASTERN.	Days in Hospital.
	2 to 3	
	Croup and anuria	3
	Scarlet fever	6
	3 to 4	
	Bronchitis and anuria ...	32
	Scarlet fever	6
	4 to 5	
	Croup and pyæmia... ...	33
	Broncho-pneumonia ...	3
	5 to 10	
	Anuria and tubercular meningitis	7
	Croupy	3

	SOUTH-EASTERN.	Days in Hospital.
	Under 1	
	Double pneumonia... ...	3
	Pneumonia	48
	1 to 2	
	Septicæmia	3
	Cyanosis	13
	2 to 3	
T.	Regurgitation	14
T.	Broncho-pneumonia ...	4
	Double pneumonia... ...	9
	3 to 4	
H.	Cyanosis	19
	Moribund, paralysis of palate	14
	Croupy	6
	Regurgitation	19
	Cardiac failure and pleurisy and pneumonia... ...	12
	4 to 5	
H.	Epistaxis and croup ...	5
	Anuria	8

	SOUTH-EASTERN.	Days in Hospital.
	5 to 10	
	Delirium	5
	Epistaxis and conjunctivitis	11
	10 to 15	
H.	... ...	4
	Scarlet fever and delirium	5
	15 to 20	
	Epistaxis	3
	Septicæmia and peritonitis	9

	SOUTH-WESTERN.	Days in Hospital.
	3 to 4	
	Urine scanty	8
	5 to 10	
	Epistaxis	7
	10 to 15	
	Scarlet fever	2
	20 and upwards	
H.	... ...	3

	NORTH-WESTERN.	Days in Hospital.
	Under 1	
T.	Stridor	6
	1 to 2	
	Convulsions...	6
	Broncho-pneumonia ...	13
	Bronchitis	4 and 15

	NORTH-WESTERN.	Days in Hospital.
	2 to 3	
	Broncho-pneumonia ...	5
	Anuria	5 and 46
	Pneumonia	
	5 to 10	
	Epistaxis	4
	Epistaxis and anuria ...	3
	10 to 15	
	Pericardial effusion ...	5

	NORTH-EASTERN.	Days in Hospital.
	1 to 2	
T.	... ...	2
	4 to 5	
	Nephritis	14

	BROOK.	Days in Hospital.
	3 to 4	
	P.M. kidney weighed 3 ozs.	6
	4 to 5	
	Anuria	11
	10 to 15	
	Cardiac paralysis	11

	NORTHERN.	Days in Hospital.
	5 to 10.	
	Broncho-pneumonia ...	120

TABLE XLVIIIA.—Detailed List of Fatal cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

1895.

	FOUNTAIN.	Days in Hospital.
	Under 1	
	Broncho-pneumonia ...	2
	1 to 2	
	Moribund	2
	O.	10
	2 to 3	
	O.	4, 9, 9
	3 to 4	
	Broncho-pneumonia ...	17
	Double otorrhœa	18
	4 to 5	
	Septic pneumonia	29
	Nephritis and peritonitis ...	26
	5 to 10	
	O.	12
	Nephritis and adenitis ...	3
	Nephritis	40
	Moribund, pneumonia ...	1
	Broncho-pneumonia ...	20
	20 and upwards	
	Dyspnœa	2

	WESTERN.	Days in Hospital.
	1 to 2	
	Broncho-pneumonia ...	3
	2 to 3	
	Otorrhœa	3
	3 to 4	
	O.	2
	Broncho-pneumonia ...	4 and 16
	4 to 5	
	Delirium	6
	O.	6
	5 to 10	
	O	2 and 22
	Scarlet fever	14
	20 and upwards	
	O.	4
	Nephritis and collapse ...	8

	EASTERN.	Days in Hospital.
	Under 1	
	O.	20, 21, 39
	Recession of ribs	19
	1 to 2	
	O.	13
	Bronchitis and pneumonia	2
	Adenitis	18
	Bronchitis	10
	2 to 3	
T.	Bronchitis and pneumonia	2
	Bronchitis and otorrhœa ...	9
	Regurgitation	13
	3 to 4	
	O.	7
	Bronchitis	16
	Dyspnœa	9
	4 to 5	
	Convulsions	28
	Meningitis	41

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVIIIA. (*continued*).—Detailed List of Fatal cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

1895—*continued.*

EASTERN.	Days in Hospital.
5 to 10	
O.	8
Septic pneumonia	11
Urine scanty	3
Epistaxis	6
15 to 20	
O.	9
Diarrhœa	6

SOUTH-EASTERN.	Days in Hospital.
Under 1	
Broncho-pneumonia ...	12
2 to 3	
O.	2
Broncho-pneumonia ...	5
3 to 4	
Diarrhœa	4 and 23
Adenitis	11
Broncho-pneumonia ...	11
Septicæmia	12
4 to 5	
Paralysis of palate	9
Urine scanty	20
5 to 10	
O.	2
Bronchitis and dyspnœa ...	30
Regurgitation	2

SOUTH-EASTERN.	Days in Hospital.
10 to 15	
O.	2
Pneumonia	10

SOUTH-WESTERN.	Days in Hospital.
5 to 10	
Broncho-pneumonia ...	9
15 to 20	
Regurgitation, pneumonia	5

NORTH-WESTERN.	Days in Hospital.
Under 1	
O.	1
Convulsions	2 and 4
1 to 2	
Adenitis	5
Broncho-pneumonia ...	16
2 to 3	
Broncho-pneumonia ...	6 and 21
Convulsions	8
Paralysis of palate	3
Adenitis	6
3 to 4	
O.	20
Cellulitis of neck	9
4 to 5	
Broncho-pneumonia ...	28
Otorrhœa	44
Catarrh and pneumonia ...	14

NORTH-WESTERN.	Days in Hospital.
5 to 10	
Anuria	2 and 2
Delirium	3
Paralysis of palate, adenitis	6
Epistaxis and R. otorrhœa	5
10 to 15	
Anuria	2
Cardiac failure, paralysis of palate	47
15 to 20	
Meningitis	4
20 and upwards	
Delirium tremens	5

NORTH-EASTERN.	Days in Hospital.
2 to 3	
Conjunctivitis	9
4 to 5	
Stomatitis	15
Pertussis, tubercular meningitis	27
Broncho-pneumonia ...	29
Scarlet fever	6
5 to 10	
Otorrhœa and nephritis ...	21
Delirium	2
Otorrhœa	19
Adenitis	45

1896.

FOUNTAIN.	Days in Hospital.
Under 1	
Broncho-pneumonia ...	6
Scarlet fever	6 and 27
1 to 2	
Regurgitation and cellulitis of face	6
2 to 3	
Morbilli	24
Bleeding from mouth ...	1
Scarlet fever	10
3 to 4	
Broncho-pneumonia ...	9
Scarlet fever	13
4 to 5	
O.	21
Broncho-pneumonia ...	3
5 to 10	
Double otorrhœa	63
Diarrhœa	12
10 to 15	
Rheumatism and pyæmia ...	25

WESTERN.	Days in Hospital.
Under 1	
General stomatitis	8
Necrosis of fauces	8

WESTERN.	Days in Hospital.
1 to 2	
Broncho-pneumonia ...	2
2 to 3	
Necrotic stomatitis	12
Paralysis of palate	41
Scarlet fever	3
Broncho-pneumonia ...	4
3 to 4	
Scarlet fever...	2
4 to 5	
Cardiac failure	38
5 to 10	
Broncho-pneumonia ...	2, 8, 15
Scarlet fever...	14
Bronchitis	8
20 and upwards	
Cardiac failure	2
Pleurisy and pericarditis ...	2

	EASTERN.	Days in Hospital.
	Under 1	
	Broncho-pneumonia ...	7
	1 to 2	
	Scarlet fever	7
	Acute pneumonia	13
	2 to 3	
T.	Pertussis	5
	Broncho-pneumonia ...	7 and 30
	Croup and cyanosis ...	18

EASTERN.	Days in Hospital.
3 to 4	
Broncho-pneumonia ...	14
Anuria	7
Pyæmia and meningitis ...	46
Scarlet fever	10
Stomatitis	19
4 to 5	
Scarlet fever	6, 15, 20
Broncho-pneumonia ...	5
Bronchitis	18
5 to 10	
Pneumonia	8
Convulsions	26
Scarlet fever...	7 and 7
Otitis media, meningitis ...	52
10 to 15	
Scarlet fever	4
Bronchitis	1
20 and upwards	
Cardiac failure	86

SOUTH-EASTERN.	Days in Hospital.
1 to 2	
Broncho-pneumonia ...	15
Morbilli	4
Morbilli and bronchitis ...	17
3 to 4	
Broncho-pneumonia ...	11
Abscess in both lungs ...	25

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.

TABLE XLVIIIA. (*continued*).—Detailed List of Fatal cases in which no Diphtheria bacilli were found and in which no Antitoxic Serum was injected.

1896—*continued*.

	SOUTH-EASTERN.	Days in Hospital.
	4 to 5	
	O.	2
	Morbilli	2
	Broncho-pneumonia ...	11
	5 to 10	
	O.	3
	Endocarditis & rheumatism	25
	10 to 15	
	Scarlet fever	3
	Pleurisy and rheumatism ...	94
	15 to 20	
	Epistaxis	5
	20 and upwards	
	Chronic nephritis and cystic kidney	7

	SOUTH-WESTERN.	Days in Hospital.
	2 to 3	
	Scarlet fever	6 and 10
	Bronchitis	11
	Paralysis of palate, croup ...	79
	10 to 15	
	Cardiac failure	5

	NORTH-WESTERN.	Days in Hospital.
	Under 1	
	Whooping cough	28
	Broncho-pneumonia ...	26
	1 to 2	
T.	Cardiac failure	10
	Broncho-pneumonia ...	8 and 10
	Anuria	31
	2 to 3	
	Cardiac failure	4
	Broncho-pneumonia ...	6
	Paralysis of palate	25
	4 to 5	
T.	Epistaxis	5
	Urine scanty	5
	Varicella	92
	Cardiac failure	38
	Scarlet fever	11
	5 to 10	
	Cardiac failure	7
	Nephritis	5 and 6
	Tubercular meningitis ...	9
	10 to 15	
	Nephritis	21

	NORTH-EASTERN.	Days in Hospital.
	1 to 2	
	Scarlet fever	10
	4 to 5	
	Septicæmia	12

	BROOK.	Days in Hospital.
	2 to 3	
	Otitis media...	17
	5 to 10	
	O.	38

T. Tracheotomy. H. Hæmorrhagic type of Diphtheria. O. No information obtained.