into the peritoneal cavity, the ease with which deep-seated abscess may be treated, the avoidance of frequent disturbance of the patient to change dressings at the most critical time, the saving of time to the surgeon. Through knowing that he has such an operation to fall back on, the young and inexperienced or timid practitioner will be encouraged to attempt the early diagnosis of abscess of the liver with the aspirator, and to operate with confidence should he find pus. This is an important matter which practitioners in large centres may have a difficulty in understanding. Many lives are lost through delay in operating on hepatic abscess. The disease occurs most frequently in lonely out-stations in India, China, Africa or the West Indies, where there is probably only one medical man and no experienced consultant and surgeon to fall back on. Very possibly this man has never seen abscess of the liver before; probably never seen it treated surgically or himself had much surgical practice. It is very trying to such a one to have to act promptly and boldly on his own responsibility, and he is tempted to delay active interference till, perhaps, it is too late. I am sure in such circumstances the operation I describe, which is almost as easily performed as tapping a hydrocele, will be welcome.

The merits I claim for it have, I am aware, one or two drawbacks. Chief of these is the necessity for a special apparatus, not very elaborate or expensive, it is true, but, nevertheless, apparatus not to be found in the ordinary armamentarium of the surgeon. Against this I may urge that with a little ingenuity a serviceable substitute may be extemporised from the resources of most places, no matter how far from civilisation. A second drawback lies in the number of details the operator has to bear in mind, and which during the flurry of operation may not present themselves to his mind in their proper sequence. Against this I may say that if the various details have been provided for, and the steps of the operation carefully thought out and rehearsed before he proceeds with it, there is not much likelihood of confusion on the surgeon's part when the instruments are taken in hand in earnest. Difficulty of execution is an objection to an operation, and an excuse for failure; but the necessity for careful preparation is no serious objection to any operation, and the neglect of careful preparation is no valid excuse for failure.

A STUDY OF INFLUENZA; AND THE LAWS OF ENGLAND CONCERNING INFECTIOUS DISEASES.¹

BY RICHARD SISLEY, M.D. LOND.,

MR. PRESIDENT AND GENTLEMEN,—The question which I ask you to consider to-night is whether anything can be done to check the spread of influenza, and whether any of the laws affecting public health can be of use in helping to secure this object. Owing to the present state of knowledge or of ignorance which exists amongst the people of this country with regard to disease, it is advisable that sanitary authorities should not use any powers they possess unreasonably or without a fair chance of their being successful in accomplishing the end in view. The old idea that an Englishman's house is his castle still exists and is strongly held by the masses of the people, and all interference with what is considered personal liberty is strongly resented. Should inconvenience and expense be caused to the public without obvious and correspondent advantage the people will begin to resent all sanitary interference, and in the present state of sanitary law and sanitary authorities this would undoubtedly lead to much strife amongst those various representatives of the people who are now selected to form those authorities. And so the progress of sanitation would be checked, for under the present system no arrangement made by popularly elected bodies can be efficiently carried out without the tacit consent of those who elect the members of those bodies. Whether this state of things is satisfactory I will not here pause to

¹ Read before the Society of Medical Officers of Health.

consider. It is enough to allude to it as a factor which cannot be ignored.

The preliminary questions which naturally arise are: 1. Is an epidemic of influenza of sufficient national importance to make it worthy of attention? 2. Do we know enough about the mode in which influenza is spread to justify us in saying that it is infectious?

It is impossible to give in accurate numbers the sum of those disabled, and of those killed, by an epidemic of influenza, or more than roughly to estimate the money loss to the country of such an epidemic as that of 1889-90. The charts

which I exhibit show the increase of mortality in London during the epidemic of 1803 and of 1889-90, and the bills of mortality of the cities of St. Petersburg, Berlin, Vienna, Paris, and New York during the epidemics of 1889-90 (See Fig.), and Sheffield during the year 1891. These charts do not show the number of deaths which were due to influenza, but they do show the increase of death-rate which accompanies epidemics of the disease. "It is found that during an epidemic many people who already suffer from organic diseases which would ultimately prove fatal die sooner than they otherwise would because they are not strong enough to overcome the depressing effects of influenza in addition to those of pre-existing disease. It is common for diseases of the respiratory organs to follow an attack of influenza, and the maladies thus set up may not end fatally for weeks, months, or even for years."

The Report of the Registrar-General, which has been re-

² On the Prevention of the Spread of Epidemic Influenza. A paper read before the International Congress of Hygiene and Demography, August, 1891.

cently published, shows that the number of deaths directly ascribed to influenza in England and Wales in 1890 was only 4,523, but the Registrar-General points out that this by no means truly represents the number of deaths which it really caused. He says: "If we assume—as we may, though not with certainty, yet with much probability—that the increased mortality from pneumonia, bronchitis, and diseases of the organs of circulation, as compared with the nine preceding years of the decennium, were due to the same cause as were the deaths directly ascribed to influenza, the total number of deaths due directly or indirectly to the epidemic influenza was not merely 4,523, but 27,074, or 91 per million living." On this computation, the increase in the death-rate due to influenza was 0.941, or nearly 1 per 1,000 inhabitants. But only a small proportion of cases of influenza end fatally, and the amount of suffering endured by patients who live through the disease cannot be represented numerically. Nor should the money loss of such a visitation be entirely ignored. But I think it will be admitted that an epidemic of influenza is a serious national disaster, and that, therefore, if we know how the disease is spread, it is of importance that this knowledge should be put to some practical use.

How is influenza spread? Gray and Haygarth, amongst our older physicians, taught that it was spread by contagion. Hirsch, who is possibly not well acquainted with English medical literature, tries to prove the contrary. M. Tessier, in 1839, spoke of influenza passing "Like a cloud which obeys the caprices of the night, traverses at the same time and in the course of a few days the distance between towns situated at the four corners of the earth." In England we have had few specimens of such imaginative writing (though there have been some), but the mode of spread of influenza has been carefully studied, and it is proved beyond doubt that:

1. The first case of influenza in a town is often a patient who has come from an infected place.
2. Isolated cases of influenza precede an epidemic.³
3. Influenza spreads along the lines of human intercourse.
4. Isolated persons, such as prisoners and inmates of asylums and convents, often escape influenza.
5. The numbers of those affected in an epidemic increase till a maximum is reached, and then decline, as in the case of contagious diseases.

No one can read Dr. Parsons's report of the influenza epidemic of 1889-90 without becoming convinced of the truth of Dr. Buchanan's statement that "probably no evidence has ever been put on record in such abundance as that accumulated by Dr. Parsons's report to show that in its epidemic form influenza is an eminently infectious complaint communicable in the ordinary personal relations of individuals one with another. It appears to me," he adds, "that there can henceforth be no doubt about the fact." I fear I may be accused of an insular pride when I express my satisfaction that this important truth has been again clearly asserted, chiefly by the observations of my own countrymen, and in my own country.

Mr. President, up to the present point I feel sure that there will be a general agreement concerning the facts I have mentioned. In influenza we have to deal with a contagious and with a very destructive disease. It is usual nowadays to describe contagious diseases as preventable; and many years ago Haygarth wrote: "So far as it can be proved that a disease is produced by contagion, human forethought can prevent the mischief." Concerning this, His Royal Highness the President of the late International Congress of Hygiene somewhat pertinently asked: "If preventable, why not prevented?"

Apart from any application of legal enactments, individuals, families, and small communities may do much to avoid infection. To Dr. E. L. Trudeau⁴ of Adirondack Sanatorium, belongs the credit of trying what could be done in the way of quarantine: "Fearing an attack of the prevalent influenza might be disastrous to many of the invalids at the Adirondack Cottage Sanatorium, the place was quarantined as soon as the epidemic appeared in the neighbourhood."

The inmates of the Sanatorium did not suffer, although many people in the country around and visitors of the hotels and boarding houses were affected. Professor Bäumler quotes a case from our *Correspondenzblatt* showing how, at an inn in

the Black Forest, those who were purposely kept away from the sick escaped influenza. Mr. Townsend Barker, of Churchingford, isolated the first cases he saw at the end of 1889, and the disease did not spread at that time beyond the members of the family first affected, and himself.

I have elsewhere shown how free the inmates of jails were from infection in the epidemic of 1889, and that in seven out of a total of twenty the prisoners entirely escaped infection, though influenza was raging in the towns in which the jails were situated. Dr. Savage has called attention to the fact that confined lunatics are less liable to the disease than their keepers who are allowed to expose themselves to contagion, and he ascribes this immunity to the circumstance that they are less exposed to contagion, and not to any peculiarity in the insane diathesis.

Enough has been said to prove that apart from any rigid enforcement of sanitary legal enactments, much good may be expected to arise from a knowledge by the public that the question whether they get influenza or not must chiefly depend on themselves, that is to say, on whether they expose themselves to contagion or not.

At the outbreak of influenza in 1889 few people took any precautions against influenza, and those suffering from the disease freely mixed with others, going to parties, receiving visitors, and attending places of public resort. These practices are, perhaps, less prevalent to-day.

Is it not the duty of all sanitary authorities to give some general advice on the subject of contagion? I am glad to see that the Dover sanitary authorities have recognised that it is their privilege and duty to do so. A placard, destined to become historical and of which I am fortunate enough to be able to show you a copy, contains this warning: "The mayor, aldermen, and burgesses hereby give notice warning the public of the dangerous and infectious character of influenza, and that the disease is often spread by careless exposure of infected persons." People in less enlightened towns are taught by the newspapers, and there is an unfortunate tendency amongst the people to trust more to "cures" than to prevention. We still live in the Drug Age.

During the epidemic of 1889-90 no steps were taken to stop the spread of the disease; many doctors and writers, both in the medical and lay journals, taught that contagion played no part in the matter. In May last a conviction that this erroneous tendency did much harm led me to recommend that by a short Act of Parliament influenza should be placed amongst the diseases for which notification is compulsory. I am still of opinion that had this been done much sickness and many deaths would have been avoided. The good would have been done chiefly in an indirect manner. A discussion on such a Bill in Parliament would have concentrated public attention on the subject, the evidence of the Local Government Board would have received immediate and widespread recognition, and in this way people would have been taught that influenza was chiefly if not entirely spread by contagion, and they might have acted on their knowledge of that fact.

The notification of influenza and the isolation of the first cases would probably have prevented an epidemic in those places in which the Notification Act was adopted, and even a recognition of the fact that influenza was a disease of sufficient importance to be worthy of such precautions might have helped the effective working of the Public Health Act of 1875 in places in which the Notification Act was not adopted.

The question which now concerns us, however, is not what might have been done last summer, but what can be done now by sanitary authorities with the laws at present in force, and whilst we are in the presence of an epidemic.

The laws relating to infectious disease are by no means simple, and their working powers have still to be put to the test. Did one law apply to the whole country the matter would be comparatively simple. But the laws are diverse and the methods by which they are worked complex.

In many parts of the country the only sanitary laws in force are the Public Health Act of 1875 and the Epidemic and Other Diseases Prevention Act, 1883.⁵ Under the former,

⁵ The Epidemic and Other Diseases Prevention Act, 1883, 46 and 47 Vict., c. 59. This Act gives sanitary authorities power to borrow money to be spent in cases of epidemic, endemic and infectious diseases, when such outlay is ordered by the Local Government Board. The money is spent for (1) interments, (2) house visitation, (3) medicine, and (4) disinfection.

³ *Epidemic Influenza: Notes on its Origin and Method of Spread.* Longmans. 1891.

⁴ *Medical News*, Philadelphia, p. 28, xiii, p. 11.

Section (126): "Any person who, (1) whilst suffering from any dangerous infectious disorder, wilfully exposes himself without any proper precautions against spreading the disorder in any street, public place, shop, inn, or public conveyance, or enters any public conveyance without previously notifying to the owner, conductor, or driver that he is so suffering..... shall be liable to a penalty not exceeding £5." There is another provision which might apply to sending letters.

It is by no means certain that a conviction under this section could be upheld against a person suffering from influenza. It is probable that it would be pleaded that influenza is not a "dangerous infectious disorder" within the meaning of the Act. The word "dangerous" might afford a legal loophole for escape.

That the possibility of such a plea has been considered appears certain from the wording of the Public Health (London) Act, 1891. In this Act some "dangerous infectious diseases" are compulsorily notified; other infectious diseases may be, under certain conditions, added to the list, and then "every such infectious disease is in this Act referred to as a 'dangerous infectious disease.'" It seems, therefore, that a conviction of an influenza patient under the Act of 1875 might give rise to a very interesting and important legal decision.⁶

Should it be decided that influenza is a "dangerous infectious disease," sanitary authorities will be obliged to act on that decision; but if it is not a "dangerous infectious disease" within the meaning of the Act, the Public Health Act, 1875, will be of no avail. If, however, it be held that the Act does apply to influenza, it is worthy of note that rural authorities will be in a better position to deal with influenza than the sanitary authorities of London are at the present time.

The Infectious Diseases (Notification) Act, 1889, is an adoptive Act. Where it is in force, the notification to the sanitary authority of the incidence of some infectious diseases is compulsory. These diseases are small-pox, cholera, diphtheria, membranous croup, erysipelas, the disease known as scarlatina or scarlet fever, and the fevers known by any of the following names: typhus, typhoid, enteric, relapsing, continued, or puerperal. Power is given to the local authority to place any other infectious disease under the working of the Act. The means by which a disease is placed in the list is this: the local authority must be summoned to pass a resolution to this effect. In the ordinary course, fourteen days' notice is necessary, but in an emergency three clear days' notice is sufficient. In the latter case, should the sanitary authorities adopt a resolution to add the disease to those for which notification is compulsory, the authority must send a copy of the resolution to the Local Government Board for approval, and "give public notice thereof by advertisement in a local newspaper and by handbills, and otherwise in such a manner as the local authority think sufficient for giving information to all persons interested." Such a resolution has no force until the expiration of one week from the date of the advertisement, but unless approved by the Local Government Board, shall cease to be in force at the expiration of one month after it is passed, or any earlier date fixed by the Local Government Board.

It is evident from this that influenza cannot immediately be added to the list of infectious diseases for which notification is necessary. What is the least time in which this can be done? Let us suppose that some member of a sanitary authority should decide to-night that the notification of influenza is desirable. If things work as he wishes, and as rapidly as the law allows, how soon will notification be compulsory? Let us take an instance.

January 20th. Notice given to every member of the local authority that the resolution will be proposed. January 21st, 22nd, and 23rd. Three clear days' notice. January 24th. Sunday.

January 25th. Meeting of authority. Decision of authority to adopt the resolution. Advertisement in local paper; same evening (possible, not probable). Notice to Local Government Board. January 26th, 27th, 28th, 29th, 30th, and 31st, Sunday.

February 1st. Resolution in force (thirteenth day) twelfth day the first possible.

Thus the earliest time in which such a resolution can come in force is twelve days.

Now should a sanitary authority wait till influenza is prevalent in their district, and then at length decide "something must be done;" and pass such a resolution to adopt the Act, it will come into force too late to be of much service. But the expense to the authority will not be small. In addition to the cost of paying two shillings and sixpence for each case notified, the Sanitary Authority may have:

(1) Under Section 6, to disinfect houses and bedding.

(2) Under Section 15, to provide temporary shelter or house accommodation with any necessary attendants for the members of any family in which any infectious disease has appeared who have been compelled to leave their dwellings for the purpose of enabling such dwellings to be disinfected by the local authority.

No sanitary authority should lightly undertake such work during the height of an epidemic. If the Act be adopted before the existence of an epidemic the matter is a different one, and what is required is that the whereabouts of the first cases should be known, and that these patients should not be allowed to spread the disease.

The Infectious Disease (Prevention) Act, 1890, like the Notification Act, is adoptive, but for its adoption more time is required. Under Section 3 it is provided that fourteen days' notice are required to be given to all members of the sanitary authority before a resolution for the adoption of the Act can be proposed. Should the Act be adopted the fact must be advertised, and the law only comes into force one month after the appearance of the advertisement. Notice of the resolution must also be sent to the Local Government Board. Six weeks, therefore, is the least time in which the Act can be brought into force in places which have not already adopted it.

The sections of the Act which apply to influenza are Sections 5 to 18, and one or all of these may be adopted.

Section 6 makes provision for the disinfection of bedding. Section 7 refers to the disinfection of houses; Sections 8, 9, 10, 11 to dead bodies. Section 12 provides for the compulsory detention of persons suffering from infectious diseases. Section 13 relates to infectious rubbish. Section 14 provides that when Sections 7 to 13 are in force, notice of their provisions shall be given to the occupier of any house in which it is known that there is anyone suffering from an infectious disease. Section 15 provides for the temporary accommodation at the expense of the local authority of people who are compelled to leave their houses during the time they are disinfected. Section 16 provides for the execution of penalties on those who obstruct the working of the Act. Section 17 gives power of entry of the local authority for purposes of disinfection.

The provisions of this Act alone would be of little use in checking the spread of influenza. Doubtless bedding and houses should be disinfected; but if influenza is not considered a "dangerous infectious disease" under the Public Health Act of 1875, what will the disinfection of houses avail? Patients suffering from influenza will in that case be allowed to freely spread the disease by going into public places, and will then have their houses disinfected at the public expense.

It is pretty evident that the sanitary law affecting rural and urban districts is not certain to be able to afford much help in preventing the spread of influenza. The Public Health Act of 1875 and the Notification and Prevention of Infectious Diseases Acts do not apply to the metropolis. London is governed by the Public Health (London) Act, 1891, which came into force on January 1st last. It is the latest and most complete triumph of sanitary law, and the London ratepayer will doubtless hopefully expect much from it. May he not be disappointed.

⁶ In 1815 it was held that there could be no doubt in point of law that if a person unlawfully, injuriously, and with full knowledge of the fact exposes in a public highway a person affected with a contagious disorder, it is a common nuisance and indictable as such. Judgment of Le Blanc, J., in *Rex v. Vantandillo*, 4 M. and S. 73, *Rex v. Burnett*, 4 M. and S. 272, is to the same effect. "These were convictions for exposing on the King's highway persons infected with small-pox, but it is equally an offence indictable at common law to expose in public persons labouring under any other infectious disease whereby the health of the public may be endangered. A person was indicted for bringing a horse diseased with glanders into a public place to the danger of the Queen's subjects. *Reg. v. Henson*. Dears convicted, and the conviction upheld. *CC. 24.*" *The Law of Public Health*. By William Cunningham Glen, Barrister-at-Law; and Alex. Glen, M.A., LL.B., Barrister-at-Law. Tenth edition. P. 203. London: 1883.

In rural districts, as we have seen, it is possible that influenza may be recognised as a "dangerous infectious disease," and then the sanitary authorities may and ought to fine patients who expose themselves whilst suffering from it. No such provision giving such power exists in the London Act. At the present time anyone may without let or hindrance, whilst suffering from influenza, go to any public place, drive in any public conveyance, and spread a disease which, as we have seen, was in the year 1890 responsible for the death of over 27,000 people.

Now, Mr. President, this does not seem to be an ideal hygienic arrangement. It is worthy of note that there is at present a difficulty in sending to a hospital a patient who has influenza. I have to thank Professor Wynter Blyth for telling me the difficulties he himself experienced. The St. John Ambulance Society declined to carry the patients because influenza is infectious. The Metropolitan Asylums Board declined to allow their ambulance to be used because influenza was not in their list of "dangerous infectious diseases." Three cabmen declined to take the patients in spite of the fact that Professor Wynter Blyth offered to disinfect, and possibly because he insisted on the necessity for the disinfection of their cabs after the journey.

Foreigners justly congratulate us on our sanitary arrangements, but the state of things just mentioned is hardly worthy of the capital of a nation which takes the lead in hygienic measures. The "dangerous infectious diseases," for which notification is compulsory in London, are the same as those named in the Notification Act, and have been already enumerated. But it is within the power of any London vestry to add to this list.

The conditions under which this can be done are similar to those for putting the Notification Act into force. Under Section 56, subsection 5, it is provided that in an emergency a meeting of a sanitary authority may be called at three clear days' notice. A resolution making influenza an infectious disease under the working of the Act may then be passed, and this regulation will come into force one week later. The least time, therefore, at which the Act could possibly be made available is twelve days. It is not probable that any medical officer would advise, or any vestry adopt, such a course. It is still more improbable that all London vestries would adopt this course. If they do not adopt a uniform course of "masterly inactivity" influenza may be a "dangerous infectious disease" in one street and not in the next. The vestries, therefore, are likely to leave matters to the County Council, which under Section 56, Subsection 6, has the same power in London of adding any infectious disease to the list. Should the County Council exercise this power the impending strife between the County Council and the vestries will begin in earnest.

Some reference must be made to the remote effects of placing influenza under the same provisions as the diseases which are at present under the Act. Under Sections 60-61 much expense would probably be caused by carrying out disinfection, and under subsection 4 in providing accommodation and necessary attendants for those who had to leave their dwellings in order that they might be disinfected. Under Section 69 it seems that no tradesman having influenza could engage in any occupation connected with food, or carry on trade or business in such a manner as to be likely to spread the infectious disease.

From these facts it is evident that the height of an epidemic is not the time to insist on the compulsory notification of influenza. Should this now be done, the Public Health (London) Act of 1891 would throw on the sanitary authorities duties which they could not possibly carry out, and on the people a burden greater than they could bear. But, if the good people of Dover who have influenza can be kept indoors by a monitory notice, so much the better; and if the section of the Act of 1875 does refer to influenza, sanitary authorities under that Act may be able to effect much by putting its provision into force. The Act does not apply to London, and it cannot be considered satisfactory that sanitary authorities have no hold whatever on those who recklessly spread disease and death.

The tendency of modern legislation has been to give a certain amount of "local option" to sanitary authorities in dealing with infectious diseases. Now, if we assume that

members of vestries and county councillors are always led to their decisions by considerations of the public interest, we are also compelled to admit that they are not always skilled in sanitary matters, and unless and until this is the case it is to be feared that the results of their deliberations will not always be ideal ones.

Questions affecting the public health are of the greatest national importance, and should be decided by those who have some training in, and knowledge of, the subject. And the application of this truth is general. Inspiration teaches and experience proves that figs are not produced by thistles, nor is it to be expected that good sanitary laws can come from professional politicians when it is remembered that "politics is the madness of many for the gain of a few."

Mr. President, it must be evident that the present laws are not perfectly adapted to the circumstances in which we now find ourselves placed, nor is much improvement in this respect to be hoped for until the Sanitary Service is consolidated and become one fold under one shepherd—a Minister of Public Health.

SOME REMARKS ON THE INFLUENZA BACILLUS.

By E. KLEIN, M.D., F.R.S.,

Lecturer on General Anatomy, etc., St. Bartholomew's Hospital.

THE account published in the BRITISH MEDICAL JOURNAL of January 16th, 1892, of the observations of Pfeiffer and Kitasato on the constant and copious occurrence, in the bronchial secretion of cases of influenza, of a species of minute bacilli well characterised morphologically and culturally, as also the observations of Canon on their occurrence in the blood of influenza cases induce me to give an account of some observations which I have made during the end of December 1889 and the beginning of January 1891, that is, during the early presence of the epidemic in London. By the kindness of Dr. Stephen Mackenzie I was enabled to see and examine cases of influenza in the acute stages at Dr. Barnardo's home, which I think were amongst the first cases which occurred in London.

Examination of the Blood.—The blood was examined in cover-glass specimens dried in a thin film, stained and mounted, and in cultivation on gelatine and on ordinary nutrient agar. The cases were those of boys between 10 and 15 years of age: all were in the febrile stage, ranging from a few hours to twenty-four hours since the first symptoms appeared. In one out of these six cases there were present in the cover-glass specimens—stained in rubin first, then in methyl blue anilin water—comparatively few minute bacilli; they occurred singly, a few as dumbbells, and only rarely as small groups. As regards thickness, length and polar staining, they compare completely with those described by Pfeiffer and Canon, but some of the bacilli were quite as long as those of the mouse septicæmia with which Pfeiffer compares them. In the remaining five cases no bacilli of any kind could be discovered in the specimens. All the tubes inoculated with the blood of these six cases remained sterile.

Examination of Bronchial Sputum.—This was examined in three early cases, which had passed a few days previously through the acute febrile stage and were without fever when examined; they had bronchitis with fairly copious greyish purulent sputum.

CASE 1.—E. F., a lad about 16 years of age, had a febrile attack for two days, and was kept in the infirmary for several days afterwards. Sputum, after well rinsing out the mouth, was brought up and used for cover-glass specimens and afterwards for cultivations. The cover-glass specimens revealed a condition such as is described by Pfeiffer of some of his uncomplicated cases, namely, minute thin bacilli in larger and smaller clumps, and in some places almost like a pure cultivation. The bacilli are about the thickness of the bacilli of mouse septicæmia, half their length, and in well stained specimens most of them show the characteristic polar staining pointed out by Pfeiffer; but I find amongst the groups of bacilli a good many that are quite as long as the bacilli of mouse septicæmia. From this sputum cultivations were made in the following manner: A particle of the sputum was placed in a few cubic centimetres of sterile salt solution contained in a sterile test tube, well shaken, and from this dilution gelatine tubes, broth tubes and agar tubes were inoculated. The broth and agar tubes were incubated at 37° C. Some of the broth tubes became turbid after twenty-four hours,