say, only when cholera has become epidemic in the port affected. Is this sufficient? Certainly not. Is it essential that cholera should be epidemic in Bombay in order that pilgrims embarking in Bombay should carry cholera with them? Numerous examples, of which one is quite recent,¹² prove the contrary. It would be an event of the first importance if it were decided that no pilgrim, under any circumstances, could embark without obtaining a sanitary passport. This is my first criticism. The second is as follows: Cholera can be transmitted not only by persons but also by things. The things likely to carry the infectious germs are especially those in common use. Now these things can be sterilised and rendered harmless without being damaged, by being placed in a steam-pressure stove; this has been proved scientifically by experiments made at the Exposition Universelle, in 1889. At the present time thirty-four of your large ships are provided with these stoves. To erect such apparatus in the principal ports of Hindostan would not cost much, and would be a great advantage. If no pilgrim could leave India without having been seen by a physician, if in every case the effects of pilgrims were passed through the disinfecting oven, there would be, in reality, every chance that they would no more carry cholera into the Red Sea.

I say "no more," and this brings me to my third proposition. In my previous communication I said that if, in spite of all, the fatal germ escapes, a grave responsibility is taken if opposition is made to measures designed to destroy it before it has sown death upon the European continent. The answer I receive is, There ought not to be quarantine under any name by which it is concealed; quarantine has never prevented the spread of anything. That the measures ought not to be quarantine I am quite willing to allow, and I have already let it be understood that there are better things to be done; medical inspection and disinfection, well performed, are, in my opinion, very much better guarantees than the old quarantine system. But to say that quarantine has never prevented anything is too absolute an assertion. How many facts can be invoked on the other side? I will quote two; in the first, the absence of quarantine measures was the cause of a terrible epidemic; in the second, evil appears to have been checked by a severe quarantine. In 1865 an English ship, the *Sydney*, arrived at Suez. Owing to an incorrect declaration by the captain who concealed the fact that deaths from cholera had occurred on board, she was allowed to pass. No quarantine. She arrived at Alexandria and disembarked passengers. Cholera broke out, increased, and caused 60,000 deaths in Egypt. In 1891 an English ship, the *Deccan*, arrived at Camaran with more than 1,200 pilgrims. Cholera was reported on board this ship. The pilgrims went to Jeddah. Cholera accompanied them and prevailed severely in Jeddah and Mecca. On August 8th, the ship *Adana* left the port of Jeddah for El Tor with 971 pilgrims. During the voyage 18 deaths occurred from cholera, 6 occurred during disembarkment at Jebel-Tor. Quarantine was imposed there. More than 10,600 pilgrims underwent a most rigorous quarantine. The scourge was stopped at the entrance to the Canal; Egypt and Europe were preserved from it. A very robust belief in the inefficacy of quarantine is needed to maintain that quarantine was useless in this case. Would it have been better to have allowed cholera to have freely entered the Mediterranean, and ought nothing to have been learnt from the lessons of 1865 and of 1884?

I fear that here again we shall not be in agreement, and that you will think that I am right only when I admire. I would regret this very much, for in order to destroy cholera it is necessary for us to have not only the active but the energetic co-operation of England, and a journal such as the BRITISH MEDICAL JOURNAL which has so much legitimate influence on public opinion could do much to obtain that assistance. I hope at least that it will be believed that in this discussion I am inspired by no other sentiment than a desire to ascertain the truth, and to serve the public weal.

¹² I allude to the epidemic which broke out in September on board the English ships, the *Marathon* and the *Redbreast*. As a general rule, of the victims of cholera in Bombay few are inhabitants of the city. "Of the total cases of cholera, 84.3 per cent. were strangers," Dr. T. S. Weir, health officer of Bombay. (*Report on Sanitary Measures in India in 1888-89*, p. 132.)

REMARKS ON AN OPERATION FOR ABSCESS OF THE LIVER.

By PATRICK MANSON, M.D., M.R.C.P., LL.D.

A good many years ago I was asked to see a man said to be suffering from intermittent fever. After examining him carefully and hearing his story, I concluded he was suffering not from intermittent fever but from abscess of the liver. In addition to other symptoms, there was distinct enlargement of that organ; but, owing to the absence of localised swelling or bulging or localised pain or tenderness, I could not say positively what was the exact situation of the pus, if pus were present. I determined to aspirate, partly with the view of clearing up diagnosis, and partly in the hope that if I found pus and emptied the abscess with the aspirator I might cure the patient. At the time of which I speak the aspirator was a new instrument and much was expected of it—cure of liver abscess among other things.

In the absence of definite guide from either swelling or pain or other localising sign, I elected to enter the needle at a point just below the ribs and about midway between the ensiform cartilage and the nipple line. The abscess was not reached until the needle had been driven in to its full extent—that is, about 4 inches. Some 10 ounces of pus were withdrawn. For a day or two the patient improved, but hectic recurring, I had to repeat the operation, and eventually the man died from exhaustion and hectic.

At the *post-mortem* examination an abscess of very moderate dimensions, with somewhat thick and uncollapsing walls, was found deep in the liver, well towards the upper and back part of the right lobe. The rest of the gland was healthy, and there seemed to be no reason, could this abscess have been opened and drained in an efficient manner, why the case should not have terminated in recovery.

Until recent years the operative treatment of abscess of the liver had proved so unsatisfactory that not a few physicians of experience—Martin and Budd, for example—deemed it right in all such cases to abstain altogether from recommending active surgical interference. They considered—and with a fair amount of statistical support—that a patient had a better chance of recovery if the abscess were left to itself than if it were opened with knife, trocar, or caustic; they considered that the chance of recovery by waiting for possible rupture of the abscess externally, or through the lungs, or into the alimentary canal, was distinctly greater than any offered by operation. Whether operated on or left alone, the mortality from suppurative hepatitis in pre-Listerian times was about the same, and was set down at something between 80 and 90 per cent. Since the introduction of aseptic methods, combined with a bolder system of treating the abdominal cavity, the position of Martin and Budd and their followers is no longer tenable. Surgery has reduced the mortality from this disease to something between 15 and 50 per cent., and it is now fully recognised that the rules which guide treatment of abscess elsewhere must be rigidly observed in treatment of abscess in the liver.

It is one thing, however, to recognise rules and principles, it is often quite another thing to apply and carry them out; and unfortunately, in the case of the liver, there are anatomical conditions which make the efficient application of these rules and principles peculiarly difficult. Suppose that the initial difficulty of diagnosis, often very great, has been successfully overcome, and suppose that the aspirator has demonstrated the presence of pus at the upper part of the right lobe of the liver, a very usual situation; and suppose the abscess is found to lie some three or four inches from the surface, how are we to treat it so as thoroughly to empty it and provide efficient drainage? The direct road to an abscess in this situation is through the thoracic wall, pleura, lung and diaphragm—an impracticable route in the early stage of liver

Fig. 12

abscess before adhesion of pleura and solidification of lung have taken place. It has therefore to be left alone, or emptied by the aspirator, or incised and drained from some point above its most dependent part. If left alone for a time to eat its way to a safe striking distance from the surface it will certainly erode and destroy much liver tissue, perhaps rupture in some untoward direction, and certainly lead to rapid deterioration of health and diminished chance of recovery. If aspirated it will in all probability reaccumulate. If an attempt is made to reach it with the knife, or knife and forceps, or trocar from the front or side, several inches of liver tissue will have to be divided, and a proportionate risk from hæmorrhage incurred, in addition to the grave risk of escape of pus into the peritoneal cavity as yet unprotected by adhesions; and, after all, if these dangers have been overcome, and if the surgeon has entered the abscess cavity, he will still have the uncomfortable conviction that the entry has been made, not at the lowest and most suitable point for efficient drainage, but at the highest and most unsuitable, and that very likely there will still be bagging of pus to contend with.

These were the conditions present in the case I have briefly alluded to. It was the feeling that probably this life had been lost from inability to apply effectually the important surgical principles of early evacuation and efficient drainage which led me to devise and practise the operation I am about to describe. This operation, though specially suited to cope with the surgical difficulties present in such cases, is equally applicable to all kinds of liver abscess, as well as to purulent collections in certain other localities—empyema for instance. I have practised it frequently with success, others have done the same; and where undertaken sufficiently early in the case, and before disorganisation of liver tissue has proceeded too far, it may be looked to with confidence. The apparatus required is as follows:

1. A trocar and cannula about $\frac{3}{4}$ of an inch in diameter. The flange of the cannula is provided with a transverse and suitably-shaped bar to facilitate manipulation. The available length of cannula ought to be at least 4 inches. The point and cutting edges of the trocar ought not to project beyond the end of the cannula further than is absolutely necessary. (Fig. 1.)

2. A silver shield, $2\frac{1}{2}$ inches in diameter, at right angles to which has been soldered at its centre a stout tube of the same metal $1\frac{1}{2}$ inch in length. This tube, which I shall call the "stem," is screwed on the outer surface so as to carry a rubber washer, a metal washer, and also, and over these, a screw binding clamp shaped and acting like the handle of an ordinary copying press. The lumen of the stem ought to be barely $\frac{1}{8}$ an inch in diameter. The stem is not attached directly to the principal part of the shield, but to a sort of cell which occupies its centre. This cell is $\frac{1}{2}$ of an inch in diameter by $\frac{3}{4}$ of an inch in depth; the object of this arrangement I shall describe presently. (Figs. 2, 3, 4, 5.)

3. Two silver thimbles. One is about $\frac{3}{4}$ of an inch in length, with a diameter of rather less than $\frac{1}{4}$ of an inch at its button-shaped head, and a little more than $\frac{1}{4}$ of an inch at its stem. The stem is hollow, and rough-

ened on the outside. The other thimble is made in exactly the same way, only its head is drawn out to a length of 2 inches or more. (Fig. 6.)

4. A steel stilette 14 inches long and about $\frac{1}{4}$ of an inch in diameter. Both ends for a distance of $\frac{1}{4}$ of an inch are filed down to the thickness of a fine knitting needle, so that they may fit loosely into the hollow stems of the thimbles. (Fig. 7.)

5. Nine or ten inches of good $\frac{1}{4}$ -inch rubber tubing. The outside measurement of this must be larger than that of the cannula, but, at the same time, not so large as to have its lumen materially contracted when it is passed into the stem of the shield. It ought to fit this so as to be slightly held, just sufficient to make the joining between them airtight.

6. Six feet of stout rubber tubing of a size sufficient to allow of its being easily slipped over the free end of the stem of the shield, and yet small enough to grasp this firmly. In any case it must be considerably larger than the drainage tube just described. I shall call this "the siphon tube." A foot from one end a stout glass tube, 2 or 3 inches long, is let in and firmly whipped; this serves as a window through which the character of the contents of the tube and the rate at which they move can readily be ascertained. (Fig. 8.)

7. A large wide-mouthed bottle having a capacity of at least thirty ounces; and a small wide-mouthed bottle having a capacity of about two ounces. The mouth of the larger bottle should be wide enough to admit the smaller bottle. (Figs. 9 and 10.)

8. A disc of thick, close-grained, and soft plaster leather, 10 inches in diameter, having a rim 1 inch broad of emplastrum saponis or other non-irritating adhesive preparation spread as a ring on the outer circumference of its undressed surface.

9. A circular, accurately-cut dressing of some antiseptic gauze, barely 8 inches in diameter, and eight or ten layers thick.

10. Scalpel, scissors, two clamps, safety pins, thick silk thread, two 10-inch broad flannel bandages, salicylic wool, 5 per cent. carbolic lotion.

In anticipation of operation the thimbles are attached in the way shown to the smaller rubber tube, about to serve as a drain, by a firm and neat lashing of coarse silk thread. (Fig. 11.) Two eyes, as large as the rubber will admit of, are then cut in this tube at the end attached to the smaller thimble; one eye should be close to the thimble, the other on the opposite side and about $\frac{1}{4}$ inch higher up. The large siphon tube is filled with carbolic lotion, and its ends clamped so as to prevent escape of the fluid. That end of this tube which is farthest away from the glass window is attached to the small wide-mouthed bottle in such a manner that it reaches to about $\frac{1}{2}$ inch from the bottom of the bottle. I may here explain that the purpose of this small bottle so attached to the siphon tube is to serve as an anchor, so to speak, and also as a trap and additional security against the entrance of air into the siphon should any accident happen to the larger bottle in which it is presently to be placed. With the exception of the dressings, all the apparatus must be placed in carbolic solution for some hours prior to the operation.

Immediately before commencing, the drainage tube is mounted on the stilette. To effect this the stilette is passed into one of the eyes already cut in the tube, and carried along until it enters the long-headed thimble; the tube is then put slightly on the stretch, and the other end of the stilette introduced into the smaller thimble. When this has been

Fig. 3.—(Reduced).

Fig. 2.—(Reduced.)

Fig. 4.—(Reduced).

Fig. 5.—(Reduced)

Fig. 7.—(Full size.)

Fig. 8.—(Reduced).

Fig. 9.—(Reduced).

showing mode of attaching drainage tube to smaller thimble

Fig. 10.

Fig. 11.

Fig. 12.

done the surgeon should try if the stilette so armed can pass readily through the cannula. Having satisfied himself on this point, he replaces the instrument in the carbolic tray. The dressing is then mounted on the shield; the gauze is to be innermost, then the plaster skin with the emplastrum saponis looking to the gauze, next the rubber washer, then the metal washer, and the whole is clamped firmly down by the binding screw. The dressing, after being dusted with iodoform, is carefully wrapped in a clean aseptic covering. The operation may now be proceeded with.

The diagnosis of abscess has first to be confirmed in the usual way by the aspirator, and by one or more punctures as may be found necessary. As soon as pus has been struck the direction and depth to which the needle has penetrated are carefully noted. A large needle ought always to be used in

exploring for liver pus. Matter found, the needle is at once withdrawn, and a short incision made with a scalpel through the skin and traversing the puncture. Next the point of the trocar is entered at the needle puncture and steadily pushed on in the direction of the abscess, and to the required depth, but no farther. The trocar is then withdrawn, the escape of pus being prevented by the left thumb dexterously applied to the mouth of the cannula. The small thimble end of the armed stilette is now inserted into the mouth of the cannula, and passed on until it is brought up by the solid liver tissue on the far side of the abscess. The fore and middle fingers of the right hand are then passed under the transverse bar on the flange of the cannula, and with a rotatory movement this instrument is withdrawn, the left hand guarding against the simultaneous withdrawal of the stilette and drainage tube.

The dressing is now applied by passing the stem of the shield over the stilette. The gauze is carefully spread out on the skin, and the adhesive rim of plaster neatly smoothed down. It is well to lay over the dressing a thick pad of salicylic wool; over this the two flannel binders are pinned, one binder above the shield the other below it. The borders of the binders should meet and slightly overlap, and they ought to be pinned together and a brace passed over the shoulders to give additional security against the dressing slipping down. The whole of the dressing having been satisfactorily adjusted, the stilette and drainage tube are firmly grasped between the forefinger and thumb of the left hand, whilst the right hand, pulling on the head of the long thimble, releases the end of the stilette, and, by a little force, pushes its end through the side of the tube. The stilette being now firmly held in position by the right hand, the drainage tube is allowed by its own elasticity to resile towards the fixed end at the back of the abscess. On no account may the contracting rubber be allowed to retract from the back of the abscess, but only towards it; to insure this all that is necessary is to hold the stilette firmly in position. This effected, the drainage tube, now expanded and tightly fitting the stem of the shield and firmly plugging the wound in the liver and abdominal wall and bridging the peritoneal cavity, is cut with a scissors flush with the end of the stem. The thumb of the left hand is again called into requisition to prevent the escape of pus. That end of the siphon tube nearest to the glass window is next quickly adjusted to the stem of the shield and securely whipped on, and the other end of the siphon tube—namely, that carrying the small bottle—is dropped into the large bottle, which has been half filled with carbolic solution and stood on a stool at the foot of the bed, about a foot below the level of the patient's body. The clamps are now removed from the siphon tube, and the abscess discharges itself along this and into the large bottle. One or two tapes are attached to the siphon tube so as to take any undue strain off the dressings, and also to prevent kinking and any similar accident. It is advisable to place the patient's arm in a sling short enough to keep it out of reach of the tube, and also to administer a hypodermic injection of morphia. (Fig. 12.)

These arrangements need not be disturbed for four days at least, or, if matter still continues to flow in any quantity along the tube, for a week or even longer. Usually, in less than this time, one can see through the window in the siphon that the discharge is no longer purulent, but that it consists of blood-stained serum carrying a few flakes only of pus. When this is seen, and the pus flakes are very few, we may know that the siphon has done its work, and that it may be discarded for an ordinary antiseptic dressing.

To change the dressing the binders must be removed and the edge of the plaster turned up until a catch forceps can be applied to the drainage tube. Whilst the forceps holds the drainage tube in position the left hand removes the siphon, shield, and dressing *en masse*. A safety-pin is then passed through the wall of the drainage tube, close up to the skin, and in such a way as not to appear on the inside or to interfere with the escape of discharge. This done, the protruding part of the tube is cut off just to the outside of the pin. The safety-pin is intended to prevent the drainage tube from slipping in. The surface of the skin is then washed with antiseptic lotion, smeared with an antiseptic pomade, and an ordinary antiseptic dressing is applied and bound on with two fresh flannel binders. The dressing need not be renewed oftener than once in three or four days according to the amount of discharge. If at any time the discharge should become profuse the drainage tube may be replaced by a longer tube with the aid of the stilette, and the siphon and shield reapplied.

As regards the after-treatment of the case it in no way differs from the treatment of an abscess that has been opened antiseptically anywhere else. After a week or two it will be found that the drainage tube is loose in the wound; it may then be withdrawn and washed, and the thimble at its end cut off. It is then to be replaced and kept in as long as there is any discharge; this ceasing, the tube is shortened in the usual way and finally discarded. Unless the tube is quite loose, I would not advise its too early withdrawal for cleansing and shortening, as owing to the shrinking of the liver consequent on collapse of the abscess the track of the sinus is no

longer straight, but bent—perhaps pretty acutely—at the inner surface of the abdominal wall. Beyond this point it tends to curve in an upward direction, and in consequence the drain may be difficult to replace.

There are one or two points about this operation and the apparatus employed which might be better of some explanation. The object of the cell on the under surface of the shield is to obviate any nipping of the drainage tube in the event of a maladjustment of the dressings, or of their slipping afterwards. Neither of these things is likely to happen if ordinary care is observed; nevertheless, I think it is well to provide against such a contingency, more especially as the cell subserves another useful purpose. After the shield has been in position some time the integuments swell and protrude into the cell, and thus an additional anchor for the dressings is provided.

Another point I would remark on is the desirability of preventing the escape of pus during the operation. There are two reasons for this: first, a large escape of pus would soil the dressings and thereby endanger a sepsis; secondly, if sufficient pus is not left in the abscess cavity to completely flush the siphon tube at the moment it is connected, but only to partially fill it, then, in that case, there would ensue in the tube a mingling of pus and carbolic solution, clotting from coagulation of albumen, and possibly a blocking of the tube therefrom.

If the drainage tube before it is mounted on the stilette is too short, then, when it is stretched, it may prove too small to efficiently plug the wound during the short time intervening between its introduction and the withdrawal of the cannula and the withdrawal of the stilette, and there might ensue an objectionable escape of pus alongside, which would soil the dressings; or, if there are no adhesions between the surface of the liver and the walls of the abdomen, there might be a dangerous leakage for a minute or two into the peritoneal cavity; therefore the drainage tube should be of sufficient length to fill, when it is stretched, the puncture made by the trocar, while it is just small enough to pass easily through the cannula. Should this precaution have been overlooked, and, after the withdrawal of the cannula, matter is seen to well up by the side of the stretched drainage tube, the stilette ought to be at once unshipped and the tube allowed to resile and effectually plug the wound. The long-headed thimble is so shaped for two reasons; one is that the long head acts as a sort of guide and handle for traction when, as in the misadventure I have just referred to, it becomes necessary to remove the stilette before adjusting the dressings; the other is that it facilitates manipulation when the time comes to push the end of the stilette through the drainage tube prior to the withdrawal of the former.

When it is thought desirable to operate through an intercostal space, if it is found that this is not wide enough to transmit the trocar easily, a piece of rib ought to be excised; but it is well to bear in mind that partial excision of a rib is not so necessary as in empyema, as, of course, in abscess of the liver there is no material retraction of the chest wall during healing of the abscess. Another point: if it is considered desirable to wash out the abscess cavity, this may be done in one of two ways—namely, either by filling with boiled water or a weak antiseptic fluid the large bottle, and raising and lowering this in the same way as is sometimes done in washing out the urinary bladder, or by fixing a funnel to an arrangement of tube and stopcock attached to the window in the siphon tube, and filling with antiseptic fluid the abscess through this, the large receiving bottle being slightly raised and lowered to assist in filling and emptying the abscess. This funnel arrangement might be of use in filling the siphon tube should it become empty at any time from indraught of air or of gas sucked from the tissues, as I have seen more than once, or if it is desired to ascertain if the drainage tube is patent.

I claim for the operation I have described that it fulfils all important indications for the treatment of abscess. The opening is large, the drainage efficient, a sepsis is easily maintained, the parts are kept at rest. Owing to the action of the siphon, the lowest part of the abscess, from a draining point of view, is that in which the drainage tube opens. Additional advantages are the absolute bloodlessness, the relatively small amount of shock, the security against the escape of pus

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.