weeks, and appears to have markedly improved. He feels stronger and better in every way, and has gained $7\frac{1}{2}$ lb. in weight.*

I cannot now detect even the obscure signs that I thought I noticed at first. The sputum has greatly diminished in amount, but still contains the streptothrix bodies, and the patient has also coughed up two more of these concretions, one of which I show you. It is a hard, brittle irregularly-formed mass of lime salts apparently, almost the size, though not the shape, of a cherry-stone. It is blood-stained, and has a fetid, unpleasant smell.

As regards treatment, I should mention that the patient is having increasing doses of iodide of potassium, at the present moment 25 gr. three times a day, and also 6 minims of eucalyptus oil three times a day in capsule. He is also having much fresh air and nourishing food.

Lastly, I should like to say a word as regards the incidence of pulmonary actinomycosis, especially in the British Isles. Last summer I endeavoured to collect all the cases of actinomycosis reported in the British Isles. A few have been reported since, which I have not collated, and no doubt many cases have occurred which have never been reported, but the following figures probably represent pretty accurately the relative incidence of actinomycosis on different parts of the body in this country:

Total Number of Cases, 79.

Head and neck, 27, or 34.17 per cent.	{	Face and neck ...	24
		Tongue ...	2
		Brain and orbit ...	1
Thorax and lungs, 12, or 15.18 per cent.	{	Liver ...	20
		Intestinal tract, peritoneum, and abdominal wall ...	16
		Bladder and prostate ...	2
Abdomen, 39, or 49.3 per cent.	{	Generative organs ...	1
Lesion not stated, 1.			

Rübrah in 1899 summed together all the cases at that time reported throughout the world, and produced the following table:²³

Total, probably counting several twice, 1,094.			
Head and neck ...	...	604 (56 per cent.)	
Digestive tract ...	...	223 (20 per cent.)	
Pulmonary ...	...	164 (15 per cent.)	
Skin ...	...	26 (20 per cent.)	
Doubtful ...	...	63 (6 per cent.)	

The incidence of lung cases in the British Isles, then, closely corresponds with that obtained throughout the world.

I feel, perhaps, that I ought to apologize for again bringing before this Society so rare a case instead of talking about something of more practical importance. However, I feel sure that both cases of actinomycosis and of the obscure disorder allied to it are much commoner than is generally supposed, and that they are frequently passed over unrecognized. It is, at any rate, very noticeable that when one case has occurred in a neighbourhood, more are generally reported from time to time, indicating that where observation is on the alert then such cases are not missed.

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* In the interval between writing this paper and its publication the patient has apparently made a complete recovery. For the last five months he has had no cough or expectoration and appears in robust health. He coughed up four lung stones in all.

BEQUESTS TO MEDICAL CHARITIES.—The late Mr. Thomas Sheldon of Clevedon, Somerset, whose will has now been proved, bequeathed £500 each to the Bristol Royal Infirmary, the Bristol General Hospital, and the Hospital for Incurables, Putney, and £200 each to the Bristol Royal Hospital for Children and Women, the Bristol Eye Hospital, the Clevedon, Tickenham, and Walton Hospital, the Clevedon Convalescent Home, and the Weston-super-Mare Sanatorium.

NOTES OF AN EPIDEMIC OF INFLUENZA OCCURRING IN THE MIDLOTHIAN AND PEEBLES ASYLUM.

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THIS asylum has been singularly free from influenza, and, in the course of its thirty years' history, there has been only one previous outbreak. During the great epidemic of 1890 there were 8 cases; 7 of these occurred amongst the staff, 6 of them females, and the eighth case, regarding the nature of which there was considerable doubt, was that of a male patient. The reason for this immunity hitherto is difficult to find. The situation of the asylum is one of the most exposed in Scotland. Standing near the east coast, 700 ft. above sea level, and with no shelter from the north or north-east, it has a very trying climate for seven months in the year. The ground is damp on account of its clayey nature, and the temperature variations are so sudden and so marked, that the female patients and staff are able to spend only a little while each day out-of-doors in winter. During the fifteen years that have elapsed since the previous epidemic there have been no sporadic cases even of typical influenza.

CAUSE OF PRESENT OUTBREAK.

The conditions that prevailed at the commencement of the present epidemic were:

1. The past three winters have been very open. There has been little or no frost this past winter except during the night, and after the first week in February the temperature was much above the normal, while there was plenty of sunshine. These weather conditions allowed of the patients going out more than usual, with the result that the able-bodied have all been in more than the average good health.

2. During the past four years the wards, which were previously heated by open fires, have been heated by hot-water pipes. The temperature in the wards, therefore, has been always high compared with the outside temperature; and often, on account of a difficulty in the system of regulating, much too high. This probably rendered the patients who go about from ward to ward in working garb, such as kitchen, laundry, and ward workers, more susceptible to cold. In other respects the conditions have been changed of late years, and in the matter of food, breathing space, etc., the patients are vastly better off than they were formerly.

3. The proportion of aged and infirm patients in the asylum was very high this winter, particularly so on the male side, where fifty per cent. of the patients were so designed. It was, however, the working patients chiefly who took the disease, and the male side suffered comparatively little compared to the female side.

4. Influenza in epidemic form was very prevalent in Edinburgh, whither some one of the staff went on leave every day.

GENERAL STATISTICS.

Sixty female patients were affected out of a total of 170. Out of a female staff of 26, there were 18 affected. On the male side, of 168 patients, only 9 took the disease, and only 2 attendants out of 19. In the female hospital there were at the time of the outbreak 46 patients, of whom 22 were in bed, on account chiefly of old age or bodily weakness. Of the 46, only 6 were attacked, while of the 6 nurses 5 were affected. In the three other wards on the female side where the patients were able to go about, most of them working, about half took ill in each ward. Of the 60 cases amongst female patients, 25 were laundry or kitchen workers, 30 were strong women doing domestic work in wards and dormitories, or working in the sewing room. Only 5 of the total could be said to be in indifferent health, and of these only 1 was in bed. Of the female private patients who occupy the same wards as the others, but have a better dietary and do no work that takes them out of the wards, and who may in some instances be more warmly clad when out walking, only 4 were affected out of 25.

SOURCE AND SPREAD OF THE INFECTION.

Although the bacillus was undoubtedly carried from ward to ward, it seemed to attack those who were working outside the wards or were in "open-door" wards, and could go out and in to cold corridors as they pleased. In a paper on an epidemic in Morningside Asylum,¹ Dr. Robertson and Dr. Elkins state that the males were slightly more subject to the disease than the females.

We suggest that this preference for the males is greatly due to the fact that the men were more in the open air, where we believe the disease is contracted.

In this asylum all the male patients except those in bed have been out more than usual this winter, much oftener, too, than the women, and about one-third of them are working out-of-doors, yet the numbers that took influenza are trifling compared to the women. There is little doubt that the disease was contracted in almost all cases inside the asylum, but probably those who ran the risk of being chilled by having to go outside took the disease after coming into an infected ward. Of the 11 cases on the male side, 1 was an attendant in charge of the farm workers, 1 the storekeeper who did attendant's duty every day for an hour or two in the affected ward, 7 were patients working in the fields, and 2 were patients who, unable to walk round the grounds, were allowed to sit outside at the ward door.

In the case of the farm workers there is no doubt as to the predisposing chill, for all of them with the attendant were soaked on two occasions by showers of sleet. On the first occasion 3, and on the second 5, took ill within forty-eight hours of the wetting. These 7 out of the 40 farm workers all belonged to one ward. The others, equally predisposed by the wetting, and all working together outside, came back after work to another ward, where no influenza broke out.

The microbe was undoubtedly introduced by the first person affected, a nurse who came back from a week end holiday on March 2nd feeling ill and going straight to bed without going on duty, was found a few hours later to have a typical influenza. Four days later she got up without orders and went on duty in the hospital ward, and as yet there were no other cases. Two days afterwards she had a relapse, and on the same day two nurses on duty in the same ward took ill. Two days later the night nurse in that ward followed.

The disease then broke out simultaneously in two wards, one at each end of the adjacent corridor, first affecting the staff, and a day later the patients. Finally it broke out in the ward furthest from the hospital, and next to the common dining hall. Then it affected the kitchen and laundry staff, and it was not till sixteen days after the infection was brought to the Asylum that it crossed the dining hall and appeared on the male side and in that ward which opens off the dining hall. The wards are spread out in a long building with connecting corridors, the two divisions being separated by the kitchen and dining hall, and this march of the disease through the building was very remarkable and one of many interesting features in the spread of the disease. The two wards in which the disease broke out simultaneously on the female side are quite open and face each other at the ends of a corridor into which the corridor from the hospital opens. The ward which was affected last is shut off from these by double doors which are usually kept locked and have a passage between them. These doors are only opened to let the patients go through at meal hours. On the male side the disease broke out next the dining hall in a ward which is separated from the others by similar doors and a passage which is the entrance to the other wards, so that there is no passage through the affected ward to the dining hall. Beyond this the disease did not appear, although the great majority of the farm workers and staff were in the wards beyond.

Other interesting points in the spread of the disease were noted. Only one patient in bed was affected. The disease did not seem to spread from a patient once put to bed. The number of cases on the female side was so great that those who took ill were left in their beds in whatever dormitory they were. In these the patients of the different wards were coming in contact with each other, but in no case did the influenza seem to be contracted in the dormitories but always in the wards.

The male patients were all put into one dormitory as they became ill, but no one of the patients who occupied the other beds at night took the disease or carried it to the other wards from which some of them came.

The march of the disease on the female side seemed to indicate that the infection was carried along in the currents of air caused by the overheated wards and colder corridors, and that the patients became infected only when it reached their ward. For they were coming in contact with each other three times a day on their way to meals in the dining hall, and the men who were not affected till late in the epidemic sat within a few feet in the dining hall of many of the women from the infected wards, many of whom, too, would be already ill.

The men from the infected ward, too, are in the habit of collecting together with the patients from the other wards in a corridor for at least half an hour before each meal. Yet there was no spread in that way. The temporary hospital on the male side was in the same corridor as two wards of working patients, and yet none of these took the disease.

The small number of patients affected in the female hospital when the first cases occurred amongst the staff may be accounted for by the facts:

1. That half the patients were in bed.
2. That the others were mostly recent mental cases requiring much supervision, and the moment the staff was reduced in numbers it was no longer possible to take them outside.
3. That the hospital is connected by an outside corridor with the main building, and the hospital nurses who took ill had their rooms in the main building, and were isolated at once from their patients.

The epidemic, once it started, made rapid progress. On March 10th half the female staff were in bed. By the 12th, 20 women patients were ill, and on the 19th the first case occurred on the male side. On the 20th the epidemic attained its maximum, and there were no cases after the 24th. This rapid rise and decline is characteristic of first epidemics. This may be looked upon as the first here as far as the patients are concerned, for on inquiry only one or two seem to have had the disease previously, while the great majority of those affected are old residents. This may also account for the nature of the symptoms, which were chiefly of the nervous type that so characterized the earlier epidemics in the country.

SYMPTOMS.

In every case there was a slight initial coryza, which lasted for from thirty-six to fifty-six hours before the influenza symptoms developed. The sudden onset of these symptoms, together with the fact that there were no cases of "cold in the head" that did not develop influenza, and that suddenly, seemed to indicate that this coryza corresponded to the period of incubation. From other observations made during the spread of the first cases it is probable that the period of incubation was in these cases longer than is generally described, and certainly not less than thirty-six hours. Twenty-five per cent. of the cases developed a slight bronchitis during the incubation period, but this was never more than slight, and often had passed away before the temperature fell. The initial symptoms were almost identical in all cases. After a feeling of *malaise*, nearly always accompanied by sensations of cold waves passing over the back, and lasting from one to three hours, the person affected became giddy, with severe headache and great sense of weakness. Headache was almost a constant symptom, and as far as could be ascertained was present in 90 per cent. In half the cases it was confined to the frontal region immediately over the eyes. In 40 per cent. it was a diffuse headache. Nearly all the cases complained in addition of severe agonizing pain at the "root of the eyeball," usually in one eye, and in three cases this condition remained in a very severe form for ten days after the other symptoms had subsided.

Nervous prostration was marked in all cases, coming on suddenly and making the person take to bed at once. It was accompanied in many cases by shaking of the limbs and chattering of the teeth.

Pains in the back afterwards affecting the muscles of the legs and arms were marked in nearly all the cases. In 80 per cent. the muscles of the limbs were exceedingly tender on pressure.

The temperature was taken in a number of cases during the incubation period, but was never above normal. The nervous prostration and headache were always the first indications of a rise. It was rarely at its highest when first taken, but attained a maximum in three to six hours after the beginning of the headache. The most frequent temperature was 101° to 102.5° . In 6 cases the temperature was 103° , in 3 104° , and in 1 105° . It fell gradually with evening remissions, reaching the normal within three days except in cases mentioned later.

Loss of appetite was a constant symptom amongst a class of patients whose appetite is more than ordinarily good. There were no cases of diarrhoea, and, indeed, no alimentary symptoms other than those associated with any feverish condition.

TREATMENT.

As soon as the first symptoms developed the patients were put to bed. Milk, diluents, and later milk pudding was prescribed in every case and strictly adhered to. As there were

no abdominal symptoms a mild purge was given where necessary. Very few were able to take any nourishment during the first twenty-four hours. The headache was so severe in the cases amongst the female staff that treatment was directed to alleviate that. Nothing seemed to greatly influence the influenza headache for the first twelve hours at least. The best results were got from a mixture of pulv. ipecac. co. 15 gr., sodae salicylat. 10 gr., and phenacetin 10 gr. Ammoniated tincture of quinine was also given to some of the female staff, but it had not a fair trial as the taste was much objected to. It eased the symptoms slightly but the temperature followed the usual course. When, however, the epidemic was spreading on the female side, each of the four male wards was provided with a large bottle of the tincture which was largely partaken of by attendants and patients as a preventive. This no doubt had much to do with the non-spread of the disease on the male side, while the writer, who has had frequent attacks, ascribes his immunity from the present epidemic to the taking of a daily dose before the morning visit. Sixty-three cases, including all the males except one, were treated with carbolic acid. It was given in 1-minim doses of acid. carbolic. liq. in not less than 2 oz. of water, immediately on the onset of the symptoms, and repeated every two hours till the temperature fell to normal. In all the cases with the exception of five, the temperature fell below normal within twenty-four hours, and in a great many cases within twelve hours. This was in marked contrast to the cases not so treated. Of the 5 cases in which the temperature remained up for more than a day, four had a normal temperature by the end of the second day, and the fifth, who had a phthisical tendency, on the third day. In all the cases a complete four-hourly record of the temperature was kept, and the appearance of the charts of those treated with carbolic acid with their sudden fall below normal from 102° and 103° in twenty-four hours was striking compared to those of the cases not so treated.

A feature in all the cases treated with carbolic was the great perspiration after the first or second dose, quite remarkable in some cases, especially of the males. With the fall of temperature, and often before it, the headache and much of the exhaustion passed off, and the comparative comfort which these cases enjoyed within twenty-four hours of the first symptoms was noteworthy. Quite a number were sick after the first or second dose of carbolic, but in these cases it usually sufficed to give the dose four-hourly. Later on it was found that in those who had previously been given a purge there was no sickness from the carbolic; and on giving all the cases afterwards a purge, preferably castor oil, there were no further cases of sickness, even where the acid was continued for twenty-four hours. It was in no case given longer, and there were no signs in any case of bad effects from its use.

It may only be a coincidence that the number of cases began to decline from the day on which every one affected was put on carbolic acid, but it is highly probable that the infectivity of the cases was thereby lessened. The male cases were put on carbolic from the start, and this had no doubt much to do with the non-spread of the disease to the healthy patients sleeping in the temporary male hospital. Dr. Clifford Albutt² is of opinion that influenza is infectious only when the respiratory system is affected. Slight bronchitis, it has been already stated, accompanied 20 per cent. of the cases, but these were mostly amongst the early cases, and on the male side there was no affection of the respiratory tract. Still, the first cases of all, the three nurses in the hospital had also no respiratory symptoms, and yet they undoubtedly were infections.

RELAPSES AND COMPLICATIONS.

There were only three relapses, due in each case to the patient getting up too soon, and, as might be expected, all occurred among the female staff. Going on duty meant in these three cases going out through a cold corridor. In the case of the inmates rigid measures were taken to prevent their getting up, and there were no relapses. A thin, poorly-nourished girl, who was given to undressing herself at odd times during the day, developed a typical lobar pneumonia, but she had very little headache, and no muscular pains, and it is doubtful if she had any preliminary influenza.

There were 8 cases of ear disease, all developing on the third or fourth day of the influenza. Three of these were severe otitis media, the others being abscesses in the external auditory canal. A feature of the otitis media was the rapidity with which the pus accumulated; there was rupture of the membrane and copious discharge of pus not long after the

intense throbbing pain indicated the condition. Great benefit was derived in all the ear cases from the use of listerine. In the first case that occurred, after the pus had begun to discharge, the temperature kept going up, the patient becoming delirious and ultimately almost moribund. The ear was well syringed with water and then filled up with pure listerine, the head being held in position for half an hour. The ear was then plugged with wool and the listerine repeated every two hours, the cavity being kept filled each time for half an hour. The temperature fell from 105.6° to 102° in eight hours and to normal in two days. Listerine was used in the other cases with similar results.

One female patient, who was convalescing from an attack of melancholia, after having all the symptoms of influenza for two days, passed into a condition of acute delirious mania, with a high and remittent temperature, dying of exhaustion in ten days.

The only patient who took the disease while confined to bed was a female melancholic of 68. She had no organic cardiac disease, but she died in about twelve hours after the onset of influenza from cardiac failure, her symptoms suggesting acute poisoning of the heart. Another female developed acute meningitis after her temperature from influenza had been normal for two days. This girl was the only case amongst the relapses or complications who had carbolic acid, but she was so sick with it that she only attempted two doses.

The deaths therefore were 3, or 5 per cent. of the total female patients affected, and less than 4 per cent. of the total cases. This is a small percentage for any epidemic, and markedly so when one considers that the average age of those affected was well over 50 years, even though most of them were in good health.

Amongst the males who were treated with carbolic acid—with one exception, an attendant—there were no relapses or complications. That attendant made a slow convalescence, and four weeks after getting up developed pyelitis. He complained of severe pain in the back greatly aggravated by pressure over the left kidney, and his temperature rose to 106°. In twenty-four hours his urine was loaded with pus. He had warm sitz baths, milk diet, and urotropine 10 gr. t. i. d. His temperature fell to 102° after the discharge of pus, to normal on the fifth day, and he was quite well in ten days.

The points of note in the epidemic seem to be:

1. The spread of the disease from ward to ward in series, in spite of the fact that all the patients were coming into daily contact, and that on the female side patients from different wards slept side by side in the same dormitory.
2. That, although the staff were affected before the patients, the disease spread along the building in the manner indicated.
3. The great proportion of women affected, and the fact that the disease attacked almost exclusively the strong and working patients.
4. The effects of carbolic acid in the treatment and its probable effects in diminishing the risk of spread of the infection.
5. The septic nature of the complications and the small percentage of deaths.

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EPIDEMIC CEREBRO-SPINAL MENINGITIS IN NORTHERN NIGERIA.

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DURING the month of February, 1905, a very serious and widespread epidemic of cerebro-spinal fever broke out in Yola, a town of 22,400 inhabitants, situated on the Benue River, and about 1,000 miles from the coast. The epidemic in Yola province lasted from February 12th until the end of April, it spread over the greater portion of Northern Nigeria, travelling in a westerly direction, and was very largely confined to the trade routes.

The months in which it occurred are the hottest in the year, the temperature on several occasions reaching 108° in the shade. The natives state that they have no recollection of any such disease ever having visited them before, but I understand that in other parts of the protectorate spotted fever has been previously recognized.