the time that has elapsed since the patients have been under observation is too short. That such advanced cases do recover is well known to those familiar with the disease. I may recall that last February, at the meeting of the Edinburgh Branch of the British Medical Association, at the Royal Infirmary, Edinburgh, 6 cases of recovery from very advanced disease were shown by Dr. R. W. Philip, as illustrative of this fact. Since then, at Dr. Philip's request, I have continued to observe carefully the subsequent progress of these cases. It has been most satisfactory in every way. Some returned to work shortly after; and, notwithstanding, have continuously gained ground. One patient, who has remained in the hospital to the present time, has gained a further 33 lb. since the meeting referred to, when he had already gained 37, making a total gain of 70 lb. from the time he first came under treatment in November, 1901. It is of special interest that these 6 cases, although gravely ill so far as symptoms, physical signs, and constitutional disturbances were concerned, gave a negative result. It is accordingly in such very advanced cases that the diazo-reaction would seem to be of particular service as an aid in prognosis. It affords a supplemental test of considerable value in discriminating prognostically between cases that in other respects seem equally serious.

Whilst the presence of the reaction is to be regarded as of grave significance, especially if it persists for any time, on the other hand its disappearance must be regarded as a distinctly happy omen.

Before concluding, I desire to acknowledge my indebtedness to Dr. R. W. Philip for much encouragement and help in the record of these observations.

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TWO CASES OF HYPERPYREXIA, WITH RECOVERY.

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THE first of the two following cases appears worthy of record because of the difficulties of differential diagnosis arising during its progress, and also because of the unexpected favourable result, while the second presents some interesting points of contrast to the first.

CASE I.

Mr. J., aged 32, clergyman, of neurotic type and family, had been staying in Colwyn Bay for several weeks, but had been to Manchester twice during that time, the last occasion being on October 1st. During the night of October 3rd he had a severe "bilious attack," with violent headache, pain in the legs, drenching sweats, and vomiting. I was called to see him on the next morning, when his temperature was 101° and his pulse and respirations 100 and 16 respectively. He had the aspect of a case of severe influenza, being much depressed and bathed in profuse offensive sweat. The tongue was large and indented, and covered with a thick creamy fur. There were no symptoms or signs of throat, abdominal, or lung mischief. At the junction of the two upper thirds of the outer side of the right humerus there was present a hard bony node of about the size of half a tangerine orange, which was very slightly tender to pressure or forcible percussion, and showed no signs of active inflammation. For this he had been attended for eight or nine weeks by Dr. Leslie Jones, of Manchester, who kindly informed me later that when first seen there had been an extensive periostitis implicating a large part of the deltoid and biceps muscles, but that under treatment it had steadily decreased in size. The case was regarded as influenzal, and an aperient and a diaphoretic ordered.

From the third to the fifth day no great alteration occurred, except that the patient's condition gradually became more serious. He was delirious and sleepless at night and profoundly apathetic, lying curled up under large quantities of

bedclothes, with his eyes half closed. Profuse sudamina appeared on the third day, and were followed on the fourth by a mottled rash, which consisted of a purple zone at the base of each small vesicle of the sudaminal rash. There were no physical signs in any of his organs, no albumen, sugar, or diazo-reaction in the urine, and no alteration in the periosteal node. The spleen was not enlarged.

On the sixth day the patient was obviously worse, the morning temperature had risen, and there was very slight (and doubtful) enlargement of the spleen. At 2.30 p.m., after sitting up to take a drink of tea, he suddenly exclaimed that he was dying, and fell back in a convulsion. I saw him within ten minutes, and he was then deeply comatose, there being at first a slight general convulsion, passing rapidly into absolute flaccidity of all the muscles. The pupils were widely dilated, and the heart was beating at 160, at first forcibly, and then weakly. The mercury of the thermometer placed in the axilla rose to a point corresponding to 111.5° . (The thermometer was sent to Kew on the next day, and certified correct to 0.2° up to 110° .) Strychnine sulph. gr. $\frac{1}{10}$ and a cold pack were given, the temperature dropping to 108° ; after which he was put into a cold bath, and kept there for about forty-five minutes, being taken out when his temperature had dropped to 101° , two more hypodermics of strychnine being administered during that time. While in the bath his pupils became less widely dilated, and his muscular tone to a slight extent returned. The sudamina entirely disappeared, and left only the purple mottling. After removal to bed a rectal injection of beef-tea and brandy was given, but this was immediately returned, and between 5 p.m. and 2 a.m. on the next day seventeen excessively foul motions were passed. During the evening he still remained relaxed and comatose, his temperature rose to 104° , and he appeared to be dying. A pint of normal saline solution, with half an ounce of brandy, was therefore injected subcutaneously, a convulsion occurring simultaneously. This was regarded as due to strychnine, of which he had now received gr. $\frac{1}{10}$.

Seventh day: At 3 a.m. the patient asked for a drink, and at 9.30 told me he had not felt so well for several days. His temperature (9.30) was 102.4° , the pulse 112 and of fair tension, and respirations 24. During this and the next day the rash changed in colour from a deep purple to a typical scarlatiniform one; and Dr. Leslie Jones, who saw him on the evening of the latter day, regarded the case as one of scarlet fever. Two or three small, sharply-defined punctae (apparently haemorrhagic) appeared on the right side of the palate, and persisted after the rash had disappeared. No further physical signs appeared, and there was no justifiable indication to chisel into the bony node. Blood taken on this day was negative as regards streptococci and Widal's reaction (Pathological Department, Owens College).

From the ninth to the fifteenth days the patient was

desperately ill, and on the tenth day required another saline injection. The temperature—though this is not indicated in the chart—frequently rose to over 103° , with associated circulatory failure. On the tenth day he began to peel, the peeling being general and extremely free on the palms and soles, and being completed in about fourteen days.

The after-progress was one of tedious convalescence, with alternate constipation and diarrhoea for weeks. The evening temperature did not reach normal till the forty-seventh day, and showed frequent tendencies to rise after that. The mental apathy gave great ground for anxiety for many weeks, but ultimately a good recovery, both physical and mental, was made.

The diagnosis apparently lay between influenza, osteomyelitis or abscess of humerus, typhoid, typhus, scarlet fever, and a septic condition of the alimentary canal.

Scarlet fever seemed improbable, as he had had it two or three years before, the rash did not appear till the fourth day, and was preceded by sudamina, the pulse was not much accelerated, there were no throat symptoms, a trace of albumen was found only on the day after the hyperpyrexia, and the patient had twice, for at least a fortnight, peeled freely and in large flakes after typical influenza. The sudden onset, absence of a definitely enlarged spleen, and of Widal's reaction (eighth and fourteenth days), and of bronchial catarrh, were against typhoid. Influenza of an abdominal type or alimentary sepsis appear to be the most probable diagnoses and will, in conjunction with the patient's neurotic family and history, and his excess of clothing during the earlier part of his illness, in my opinion explain satisfactorily the main features of the case.

CASE II.

A soldier, seen at the Salford Royal Hospital in 1901, had been invalided home from India for abscess of the liver. After drainage he went on uneventfully for some weeks, but there were obviously pockets that did not drain satisfactorily. At 8 p.m. one evening his temperature, taken by the charge nurse, in whose accuracy I had every confidence, was 100.4° . At 8.20 p.m., on approaching his bed, I felt that he was excessively hot, and on taking his temperature found it to be 110° , an observation which I confirmed with a second thermometer. Despite his protests that he felt quite well, and making his acquiescence somewhat of a personal favour to myself, he was put into a cold bath for about fifteen minutes, when his temperature came down to 100° , dropping later to normal. He had no further excessive rise of temperature, and felt no inconvenience either during or after his hyperpyrexia. He died some months afterwards from exhaustion.

Recovery after such temperatures is doubtless unusual, but equally high and still higher ones have been recorded with favourable results. R. F. C. Leith¹ mentions a recovery in pneumonia after a temperature of 113.9° , and one in malaria after 114.8° . Teale² records a temperature of 110° two months after a severe accident involving several ribs and the dorsal spine, in which on four occasions afterwards the mercury in the bulb of the thermometer rose to a point corresponding to 122° ! Donkin³ describes the case of a nurse who had had typhoid, and whose temperature was at one time 110° and at another 111.6° without any special constitutional symptoms. Here the pyrexia was very evanescent, and varied from 107.2° to 98.6° in five minutes. Phipps⁴ records a case of hyperpyrexia of 110.4° in rheumatic fever, which was followed by convulsions and recovered, while Fenny⁵ also has a case of recovery after 111° in rheumatic fever.

Apparently the best, and in fact the only, chance for such cases is the prompt abstraction of heat by means of an ice-pack or cold bath, and the exhibition of stimulants, of which a saline injection appears to be the best, in that it acts as a diuretic and diaphoretic as well. It is interesting to notice that in the first case recorded in this paper the patient had more than $\frac{1}{2}$ gr. of strychn. sulph. in eight hours, two doses being combined with digitalin.

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A CASE OF GENERAL PNEUMONIC INFECTION IN A CHILD OF SEVENTEEN MONTHS,

WITH BACTERIOLOGICAL REPORT.

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It is well known that the pneumococcus of Fraenkel is an organism which not only presents extraordinary modifications in its degrees of virulence, but also is frequently associated with various diseases whose clinical aspects differ widely from one another, though from a bacteriological standpoint the causal agent is the same.

The widespread habitat of the pneumococcus and the fact that it is a fairly common parasite of man make the study of the different pathological conditions with which it is associated of more than ordinary interest. Though Fraenkel's coccus can be identified in some 60 per cent. of all cases of lobar pneumonia, yet its study becomes of special interest when the various secondary infections to which it may give rise are considered and identified. These secondary complications are not infrequently met with, and of those which have been recorded from time to time the following are of interest and importance:—Pericarditis, pleurisy and empyema, arthritis, otitis media and meningitis, peritonitis, infective endocarditis, and parotitis. In addition, Foulerton, in a recent communication, has drawn attention to a case of gastric infection undoubtedly due to pneumococcus invasion, and at the same time passes in review the general pathology of pneumococcus infection of mucous membranes.

In the present communication I venture to bring forward a case of great interest which recently occurred in St. George's Hospital. It illustrates in a fairly conclusive fashion some of the varied secondary infections which may arise from a primary lobar pneumonia. The case is a striking one not only on account of its unusual severity, but also because it manifested in quite a sequential fashion a series of multiple infections.

Before recording the details, however, it might be of advantage to pass briefly in review some of the more important secondary infections which are commonly met with in order that the completeness of the present case may be established. From statistics one cannot help concluding that the majority of cases of general secondary pneumococcus infection have a primary pneumonia as their starting point, and that subsequently the organisms spread from thence to the various organs of the body either by the blood or lymph channels.

In Kanthack's analysis of 170 fatal cases of pneumonia which occurred in St. Bartholomew's Hospital during the years 1891-5 he ascertained that in no less than 35.7 per cent. secondary complications had ensued; and that though most deaths actually took place between the ages of 20 and 40, yet the inflammatory complications were most commonly seen in young people, for in 25 cases occurring in patients under 21 years of age, no less than 64 per cent. died of secondary infections, "a percentage almost twice as high as that of all the cases taken together."

Pericarditis.

This, perhaps, is the most common secondary infection met with in ordinary lobar pneumonia, and is, especially in young children, very frequently coincident with pleurisy and empyema.

From statistics published by Still and others there seems no doubt that the pneumococcus is quite one of the commonest causes of pericarditis in young children. The pericardial fluid may be serous or may exhibit varying degrees of purulence. In all probability the affection is not necessarily due to a direct extension of the inflammatory process to the pericardium, because not uncommonly the pericarditis is present without any coincident pleurisy, and, moreover, other remote complications such as meningitis and peritonitis are by no means rare.

Pleurisy and Empyema.

These are also well-known complications of pneumonia. Unlike pericarditis, they are affections almost as common in men as they are in women, statistics showing only a slight balance in the favour of the former. It is difficult to