anticipated within three or four months. Rarely there may persist some enfeeblement of muscles in the limbs. I have a general impression, although unsupported by any figures in proof of it, that the nervous sequels of this disease have been less frequently met with since treatment by antitoxin has been employed. We are fairly justified in anticipating that such may be the case.

As indicating the remarkable advance made in pathological and clinical study in quite recent times I may recall here a passage taken from Sir Thomas Watson's classical lectures to be found in the last edition, issued just twenty-five years ago. He remarks: "All these sequelæ are significant of blood poisoning. We cannot suppose that the nervous symptoms—transient and wandering as they often are—can have their cause in any grave or material damage in the nervous centres. They denote, I presume, disturbed nutrition of the tissues from imperfect or altered conditions of its circulating blood." Watson was right in his belief that the nerve centres were not involved, but the whole subject of neuritis in its many forms now constitutes a new chapter in medicine, one for which few materials existed in Watson's time, and those the careful observations of Chomel and of Graves, now sixty-eight years old, which might have, but somehow did not, set inquirers upon the track to discover peripheral neuritis.

As indicating how the supervention of a new infection may prepare the way for fresh outbursts of diphtherial disease, I may quote the case, recorded by Dr. Hayward, of a child who, while recovering from diphtheria, was attacked with measles. On the invasion of the latter there was a renewed activity of the lingering diphtherial bacilli with a reformation of faucial membrane. Disorders of the mucous membrane of the nose and otitis are to be included amongst the occasional sequels of diphtheria, also post-nasal adenoid growths. It is probable, if not certain, that some of the post-diphtherial sequels are due, as in other cases, to the results of mixed bacillary infections. The commonly associated bronchopneumonia has been proved to be due to specific bacillary invasion of the lung. Malignant endocarditis is sometimes a sequel of diphtheria.

Malarial Fevers.—The sequels of these present several problems upon which much light has been recently shed since the discovery of their intimate nature and their dependence upon the several phases of the life of certain hæmatozoa or sporozoa. We have the fact that, according to the degree of impregnation of the system by these parasitic bodies, there remains for long, sometimes for life, a tendency to recurrence of specific pyretic processes under certain provocations, and, not seldom, the establishment of what is well known as malarial cachexia. A subject of the latter condition may resist all treatment and die of anæmia or from hæmorrhage. The liver and spleen are commonly, but not always, enlarged. Paraplegia, sometimes spastic, has occasionally been noted. Intermittent paralyses, intermittent aphasia, cramps, hyperæsthesia, anæsthesia, articular pain and swellings, cedema, and urticaria, very specially have been noted to follow malarial impregnation, all of these impressed with a periodic or intermittent character. These strange conditions we now explain by reference to the particular organs infested from time to time, and yielding manifestations of the development of the specific blood parasite. Saccharine diabetes is sometimes distinctly traceable to previous malarious impregnation. Neuralgia in various forms has been noted as a sequel affecting intercostal, occipital, sciatic, and testicular branches. The supra-orbital branch of the fifth cranial nerve is especially liable to be thus involved, the condition being sometimes described as "brow ague." We have to be careful in assigning to malarial influence any conditions of a periodic or intermittent character which may not certainly be connected with submission, at some time or other, to exposure to specific hæmatozoal infection. It is a character of all neuralgias to be paroxysmal and intermittent, even, as shown by Weir Mitchell, when of traumatic origin. But it appears certain that the effects of malarial impregnation may for many years induce a condition which modifies the course and characters of other ailments. Thus, according to Fayrer, "periodicity complicates all diseases in India." A chill induced in any way may awaken activity of febrile symptoms many years after subjection to malarial

influence. Neurasthenia and spasmodic asthma are amongst the protean manifestations recognised in this relation, also intermittent torticollis, and a rebellious form of hiccough. This peculiar latency of malarial influence has now been considered with reference to the modern doctrines held as to the nature of the disease. It is believed that the malarial germs are not absolutely destroyed, but only rendered impotent or latent by drugs held in repute for cure such as quinine and arsenic. Improved general health of the patient appears to render the hæmatozoa latent for a time. New forms of illness may induce fresh activity of the hitherto latent germs. According to Manson the causes of latency are various even for the same micro-organism. It has been proved that individuals may become immunised to the toxins of bacilli, although the microbes may continue to exist and grow. The latter may thus apparently remain latent or dormant, englobed in cells, or prevented by a barrier of cells from gaining access to the body (Washbourn). In malarial infection there is often evidence of the presence of varieties of hæmatozoa or admixture of parasites, each of which may cause various types of fever. Quinine has more power in destroying some of these than others. It appears certain that some of these bodies undergo development in various organs of the body, especially the liver, spleen, intestinal mucous membrane, brain, and bone marrow. Many of the symptoms appear to depend upon the organ selected for their accommodation and sporulation. The blood is most impregnated at the beginning of a paroxysm of fever, and least so in the apyretic intervals. As Manson has pointed out, the principal acts in the drama in pernicious cases are played out in the viscera, whence, at intervals, swarms of parasites are embolically shed into the circulation, producing the varied symptoms of malarial pyrexia. We may account for the lingering tendency to recurrence of paroxysms by supposing that the specific hæmatozoa in a given case have never been quite annihilated, but have remained latent and quiescent, locked up, as it were, in some viscus or tissue of the body, and only set free by the onset of some general disturbance which lowers the vitality and resistance of the patient. I think we may fairly anticipate that some absolute proof in support of this conception will be presented to us before the lapse of many years.

ON AN OUTBREAK OF SMALL-POX AT THE WORKHOUSE, CARDIFF.

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THE workhouse buildings consist of the house proper, the hospital, and the isolation wards, and cover an area of about 8 acres. The house is built in blocks, three storeys high, and the hospital on the pavilion plan in two storeys. The isolation wards are one storey, and are surrounded by high walls. Each block in the house is isolated and walled in.

Four inmates of a block to the extreme right, occupied mainly by old and infirm inmates and chronic and venereal cases, were attacked with feverish symptoms—two on January 10th and two on January 11th. The dates of first symptoms, appearance of rash, of isolation, and removal to Borough Small-pox Hospital, with other particulars, are noted on the accompanying table.

By January 16th these four cases were disposed of, the bedding, etc., burnt, and revaccination commenced.

On January 7th, three days before the above outbreak, a man (No. 5) was brought to the workhouse with a rash on him, which, after consultation and careful inquiry, was pronounced not to be small-pox. After events proved the diagnosis to be wrong. This man was mixing for nine days with patients in two blocks of the hospital.

The next batch of 8 cases (Nos. 6 to 13), undoubtedly infected by No. 5, broke out in one block from January 17th to 25th. No. 16, taken ill on February 5th, evidently caught the disease from one of those infected by No. 5. No. 14 was an attendant on Nos. 1 and 2 in the isolation wards who had refused to be vaccinated.

I now come to another phase of the outbreak. No. 15 was an inmate of the house, who acted as assistant barber. He

Outbreak of Small-pox, Cardiff Workhouse, 1896.

No.	Initials.	Age.	First Symptoms.	Rash.	Isolated.	Removed.	Vaccinated.	Revaccinated.	Remarks.
1	H. G.	14	Jan. 10	Jan. 11	Jan. 12	Jan. 15	No	—	Confluent, severe.
2	T. H.	68	—	" 12	" 13	" 15	No	—	" "
3	R. N.	68	Jan. 11	" 13	" 13	" 16	No	—	" "
4	L. G.	49	" 11	" 14	" 15	" 16	No	—	Confluent, severe; died.
5	F. B.	35	—	—	—	" 16	Infancy	Jan. 16	Discrete. Admitted hospital January 7th.
6	W. B.	10	Jan. 18	—	Jan. 19	" 22	No	—	Confluent, severe.
7	J. A.	5	" 17	—	" 20	" 22	No	—	Confluent, severe. Next bed to No. 5.
8	J. W.	43	" 20	—	—	" 23	Infancy	Refused	Confluent, died.
9	D. C.	29	" 20	—	—	" 23	"	—	Discrete.
10	W. C.	62	" 20	—	—	" 23	"	Refused	Confluent.
11	Nurse S.	25	" 21	—	Jan. 21	" 23	"	Jan. 21	Discrete, mild.
12	G. B.	63	" 22	Jan. 24	—	" 25	"	—	" "
13	G. M.	37	" 25	" 27	—	" 28	"	Jan. 22	" "
16	H. W.	55	Feb. 5	Feb. 7	—	Feb. 8	"	Feb. 6	" "
14	T. M.	56	Jan. 28	Jan. 30	—	Jan. 31	"	Refused	" "
15	W. D.	18	Jan. 29	Feb. 1	Jan. 30	Feb. 1	"	Jan. 31	" "
17	R. W.	40	Feb. 9	" 10	—	" 10	"	Refused	Confluent. Next bed to No. 15.
18	D. W.	67	" 12	" 14	—	" 14	"	—	Discrete.
19	H. R.	58	" 16	" 18	—	" 18	"	—	Confluent.
20	D. D.	41	" 17	" 19	—	" 20	"	Feb. 14	Discrete.
21	J. P.	47	Mar. 1	Mar. 3	Mar. 3	Mar. 4	"	Refused	"

was at the hospital not later than January 13th or 14th in the pursuit of his avocation, and before No. 5 was removed. He unfortunately became infected and started the next batch of cases (5), Nos. 17 to 21. No. 20 was removed on February 20th. I feared that he might infect other inmates in this already quarantined block, as he was mixing with them for twenty-four hours with the rash on him before he was detected. In eleven days No. 21, who had refused revaccination, showed first symptoms, and was isolated two days after as soon as the rash appeared.

Period of Incubation.—This is generally assumed to be about fourteen days. One authority says that the period of fourteen days is never exceeded, and that if after exposure to infection for fifteen days no rash appears, the person exposed is safe. The Medical Officers of Schools Association give eighteen days to be on the safe side. The late Professor Aitken, of Netley Hospital, gives the incubation period as ten to eighteen days. He says: "Bärensprung, of Berlin, has lately (1864) recorded a most interesting fact which demonstrates in a striking manner the period of latency. He observed 7 cases of small-pox, all of which were infected from the same source on the same day. In all, the outbreak occurred between the thirteenth and fourteenth days."¹ Vagedes, of Koch's Institute, reported in January last² a small epidemic of 15 cases, 4 of which proved fatal. The incubation period was determined in 11 cases and varied from eight to fourteen days. All the fatal cases were unvaccinated. In a case of suspicious rash vaccination proved of diagnostic value; he was vaccinated, and in six days all six places had taken. Some of the cases, either on admission or after the attack was over, were vaccinated without any result.

Now, taking this series of cases of ours, how do they fit in with the generally received opinion on this point? No. 5 was removed from hospital on January 16th. No. 7, the first case infected by this man, first developed feverish symptoms on the 17th, which gives an incubation period of ten days. The boy slept in the next bed to No. 5. It is impossible to draw any inference as to the period of incubation from the rest of this series of cases infected by No. 5, the latest of which (No. 13) showed symptoms on January 25th, because they were all exposed more or less to infection from January 7th to the 16th.

No. 14 was an attendant on Nos. 1 and 2 in the isolation wards who had refused to be revaccinated. He was attacked on January 28th, having been exposed to the risk of infection from the 12th to the 15th. The period of incubation in his case might be from 16 to 13 days.

In the next series of cases the first (No. 15), which was the probable source of infection, was isolated on the 30th, before any rash had appeared; and the next case in this batch (No. 17), who slept in the next bed to No. 15, was attacked on February 9th, which gives an infective period of ten days.

The succeeding cases, Nos. 18, 19, and 20, showed symptoms respectively on February 12th, 16th, and 18th. Assuming that they all caught the disease from No. 15, this would extend the infective period in No. 20 to seventeen days.

No. 16, who was attacked nine days after the removal of the last case from hospital, and who had escaped revaccination, shows how important it is to quarantine such people exposed to infection in a huge place like the workhouse until all fear of infection is over.

Revaccination.—There can be no doubt that in a large institution like the workhouse the most important means of preventing the spread of small-pox is revaccination. About 200 out of a male population of about 450 were revaccinated; none of those revaccinated early enough caught small-pox. Those who took the disease were men who refused or escaped revaccination.

Sources of Infection and Spread of Disease.—In the first batch of cases there must have been some common source of infection, introduced from outside, and which we have been unable to trace. No. 2 had come from a lodging-house at Newport, but he was not the first to be attacked, and it would be hardly fair to assume that the other three caught it from him, as that would involve the assumption that small-pox could be conveyed within two days of the commencement of the incubation period. It must be borne in mind that this man had a bath on admission, and was put into workhouse clothes before being transferred to the house. It is curious to note that no others in the block where these cases were were attacked, whereas from No. 15, who was isolated two days before the rash appeared, 4 cases were infected, although the same precautions were taken in both instances. The second case in this last batch was that of a man who slept in the next bed to No. 15; neither he nor the other three had been revaccinated. In No. 1 the rash appeared on the second day of illness instead of the third. In all four the rash appeared on the body before the face, and the premonitory symptoms were slight and irregular. All the cases were confluent and severe, and 1 died, a man who was already seriously ill with paralysis and bedsores.

When does Small-pox first become Infective, and How Long does the Infection last?—These are important questions, and should be answered as clearly and concisely as is possible. The case of No. 17, who slept in the next bed to No. 15, who was removed some time before the rash appeared, would tend to support the view that the disease is infective from the commencement of the precursory symptoms. Most of the authorities give the infective period as "under a month;" but Dr. Vacher gives it as "fifty-eight days from the commencement of precursory symptoms," which is nearly two months. Without fixing any definite time, I should be inclined to give a patient a clean bill of health after all crusts had disappeared from the body, and after three or four antiseptic baths had been given, special attention being

¹ *Science and Practice of Medicine*, 1864, vol. ii, p. 240.

² EPTOMBE, BRITISH MEDICAL JOURNAL, February 15th, 1896.

given to the hair and scalp, and the leaving behind of all clothes which he had worn up to that time.

Coming back for a moment to the question of vaccination and revaccination, it was ascertained that Nos. 6 and 7, the first infected by No. 5, had not been vaccinated, and no vaccination marks were discoverable in the first four cases. It is interesting to note the comparatively large number of cases attacked who were over 40 years of age, some of which were somewhat severe, whilst the younger people who had been vaccinated in infancy had comparatively mild attacks. Of the 21 cases here recorded, 13 were 40 years old and upwards, 5 of them being over 60. Some of the attacks were so mild that, had we not been on the small-pox track, the rash would probably have been overlooked; this has a bearing on the probable spread of the disease from mild undetected cases.

The Vagaries of Small-pox.—It is to be noted that in the first batch of cases (1 to 4) although about 100 inmates were exposed to the risk of infection, and revaccination was carried out to a limited extent only, there was no further development of the disease. Why? It is impossible to say. Then, why should it select No. 15 to act as a new source of infection in the house, and pass over some thirty or more in the infected wing of the hospital? And why should No. 16, after being exposed to infection from January 7th, not be attacked till February 5th? Again, it is not unreasonable to suppose that of all those exposed to infection from No. 15, so many would take it, and there an end. No. Four were infected by this man, and then the last removed acts as a fresh centre of infection amongst a body of men who had been quarantined, and who had already been exposed to infection for nearly a month, and No. 21, who refused revaccination, is attacked.

Recognising the great protective influences of vaccination and revaccination, are there not some other influences at work in successive epidemics, and if so, are they meteorological, virulence of poison, or what? Just ten years ago there was an outbreak of small-pox at the workhouse. A man was admitted to the hospital on February 16th, 1886, and the next day developed the disease and was removed. The next case cropped up in the house, some distance away, on March 3rd, and on March 17th a third case occurred in a man who slept in the next bed to the first case (which he only occupied for three hours) being twenty-nine days after his removal. There were no further cases. There were no cases in the town so far as could be ascertained by inquiring of the medical officer of health. Why should we have had so few cases then when, so far as I remember, no special precautions were taken beyond removal of patients affected?

Precautions Taken.—It is a happy incident that so few inmates, out of 800, have been attacked, and that the disease was confined entirely to the male side of the house. Revaccination was carried out as far as possible, but this was not all that was done. So soon as a suspicious case occurred, after his removal the bedding, etc., was burnt, and the particular part of the building where the case had cropped up was immediately quarantined for the requisite period, and no inmates allowed to go out except such as had been revaccinated.

Besides the cases here reported there were several suspicious cases which were isolated and revaccinated. In all the revaccination was successful. One other case of small-pox was caught in the tramp ward, and at once isolated and then sent to the small-pox hospital.

NOTES ON A CASE OF UTERINE CYSTIC FIBROMA.¹

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The following is a summary of the essential facts of the case:

Mrs. A., aged 67, was first seen in 1887, when on examination an abdominal tumour was found. She had always enjoyed very good health up to June, 1870, when she had a miscarriage at the third month, followed by pelvic inflammation. In June, 1880, she had another miscarriage followed by flooding. After this, as she continued to feel weak for some

months, and to increase in size, she thought she must be pregnant, and imagined she felt quickening. The swelling, however, felt hard, and not like the pregnant uterus. Menstruation at this time was perfectly regular, and continued so until the age of 60, when it ceased. As she was anxious about her condition, she consulted Dr. Thomas Keith, who informed her that she had a tumour. As it did not give her much trouble she had no further advice until 1885, when she underwent a course of treatment by ergot. This had the effect of diminishing the size of the tumour somewhat. In October, 1887, she again saw Dr. Keith, who advised treatment by electrolysis. Before this treatment was begun, however, the tumour was aspirated, with the result that 18 pints of blood-stained fluid were withdrawn. The idea of employing electrolysis was now abandoned, but no more radical operation was advised, as the patient was a bad subject for any such treatment. With the exception of some bronchial attacks, she remained fairly well until May, 1891. On the 30th of the month, owing to the further increase in size it was found necessary to tap her again. On this occasion 19 pints of fluid were removed. It had a dark red colour, and deposited a considerable amount of sediment. Under the microscope the latter showed blood corpuscles, pigment, and fatty granules. Both Drysdale's cells and columnar epithelium were absent. The fluid coagulated spontaneously on standing.

On September 3rd, 1891, tapping was again necessary. After this tapping the patient suffered a good deal from vomiting, and had pyrexia. On January 11th, 1892, when she was tapped for the fourth time, the fluid was found to contain pus, besides blood, fatty granules, and micrococci. After this she improved a good deal in health, and the temperature fell to normal. Up to May, 1895, the patient was tapped altogether on twenty-two occasions. After the tenth tapping she had some bronchitis and pyrexia. From the twelfth to the twenty-second tapping the average interval was eight weeks.

On May 25th, 1895, the patient was seized with a severe rigor, and became greatly collapsed, with a temperature of 103°. Perforation of the cyst wall was diagnosed, and the tumour again tapped, 9 pints 10 ounces of fluid being removed. On the following day dulness, tubular breathing, fine crepitations, increased vocal fremitus, and resonance were found at the bases of both lungs. The patient was very restless, suffering from cough, shortness of breath, and frequent attacks of vomiting. The pulse on May 27th was 126, respirations 40. During the next few days the temperature varied between 100° and 103°, the pulse was weak and at times intermittent, from 120—150, and the respiration rose to 56 per minute. Marked distension of the abdomen and tympanites set in on the 28th. After this the condition became rapidly worse, and she died on June 1st.

Post-mortem Examination.—The body is well nourished. There is a considerable quantity of subcutaneous fat. *Thorax.*—The left pleural cavity contains 1½ pint of blood-stained serum. The left lung is congested at its base, and the bronchi are inflamed. The right lung is adherent; some of the adhesions are old, but most of them are recent. The right pleural cavity contains half a pint of blood-stained serum. The

¹ Read in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association held in London, July-August, 1895.