Microscopical examination of the lung juice showed fine bacilli and a few diplococci; cultivations yielded an impure growth of what appeared to be the *B. influenzae*. A rabbit which was inoculated into the peritoneal cavity with 0.2 c.cm. of the lung juice died seven days later, but culture media inoculated from the heart blood, etc., remained sterile.

A point of great interest bearing upon the pathogenesis of the *B. influenzae* was observed during the progress of this work. Pfeiffer, who originally described the organism, stated that it was pathogenic for rabbits when injected intravenously, such inoculation being followed by paralysis of the hind limbs and in some cases death, but in no instance did he obtain effects resembling septicaemic infection. Cantani has also shown that it is possible to infect rabbits by means of intravenous injection, and his experiments bear witness to the powerful effects of the toxin elaborated by the bacillus. In two of our cases (*B. P.*, 1 and *B. P.*, 10) the intraperitoneal injection of material containing the *B. influenzae* was followed by death in about forty-eight hours from septicaemia, and the influenza bacillus was obtained direct from the heart blood, in one case associated with staphylococcus albus, from which it was easily separated; in the other in a state of purity. Its presence was also demonstrated microscopically in smear preparations from the spleen pulp. On the other hand, intraperitoneal inoculation of even large doses of early generations of the *B. influenzae* subcultivated upon blood agar failed to induce general infection and death.

ON "DYSPHASIA" OR APHASIA AS AN INITIAL SYMPTOM OF TUBERCULOUS MENINGITIS.

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TUBERCULOUS meningitis is a disease which, as every clinical student knows, is protean in its manner of onset. In reference to this affection, Bristowe,¹ in his work on medicine, writes: "Sometimes the first indications of disease are furnished by dullness, strangeness or wildness of manner, by impairment of memory or defect of speech." The pathology of the disease, moreover, is such that the occurrence of an aphasia as a primary symptom might at first sight be regarded as no unlikely contingency, yet while I have no doubt many such cases must at one time and another have been under observation, I find the records of them remarkably few. I have, however, in the course of my reading been able to find at least two histories similar to the one which I wish to record, illustrating the occurrence of a definite aphasia as the initial symptom of tuberculous meningitis. One of these is recorded by Schutz in the *Prager med. Woch.* for 1881, and the other by Déjerine in the *Rev. de Méd.* for 1885. The latter is further interesting in that, like my own case, the aphasia was ushered in by several attacks of a transitory character; but I will give a summary of both cases after first detailing the one which came under my own notice.

CASE I.—(PERSONAL OBSERVATION)

Transitory Aphasia occurring as a prelude to Tuberculous Meningitis.

J. B., aged 28, came under my notice in October, 1899, suffering from a chronic type of phthisis pulmonalis. He had occasional attacks of hæmoptysis, but for the first nine months he was under observation always recovered sufficiently to undertake light work between the exacerbations of his illness. Latterly the wasting and hectic fever became more marked. On December 7th, 1899, I was called suddenly to attend him for another attack of hæmoptysis somewhat severe in character. Under treatment he rallied, but remained somewhat blanched in appearance. In the course of a few days' time all traces of blood had left the sputum, and on December 11th he had every promise of recovering, temporarily at least, from the immediate dangers that threatened him. Three days later, however (December 14th), I received another urgent message from his wife stating her husband was apparently going out of his mind, and the history elicited on arrival was somewhat as follows: Mr. B. shortly after awaking that morning had become strange in his manner, and spoken in a peculiar way; his wife at first attributed this to delirium such as he had had previously, but when she could not understand her husband's speech he became more incoherent and excited than ever. At last it struck her that he wanted to know what time it was—a common question of his in the morning—and so apparently he did, for on holding the clock in front of him he looked at it, nodded assent, and quietly went off to sleep again. He had a similar incoherent attack on awakening later in the forenoon.

I saw him at 11 a.m. and found him sitting up in bed, and first appearances did not indicate anything unusual apart from his previous history. I was surprised to find that he could answer my questions regarding his general health, as to how he had slept, etc., in quite a natural tone and manner. We continued talking for some minutes, as I purposely wished by so doing to

bring out any speech defect such as his wife had indicated. In a short time the flaw became apparent. He had kept up an intelligent conversation for I should think three or four minutes, when his words became indistinct and blurred, running into each other and getting so inarticulate that, failing to understand him, I turned to his wife, and looked questioningly at her. She, being more accustomed to his talk, could still make out the drift of his conversation, while I was completely puzzled, but in a few moments more his talk had degenerated into such an unintelligible jargon, that not even his own wife could make out a single word. Seeing from our looks and remarks that we failed to comprehend him, Mr. B. endeavoured all the more to say what was on his mind, and in his anxiety to do so came out with the jargon in such an eager, persevering, and excited manner, that I at once saw how his wife had imagined he was going off his head earlier in the day. I now told him we could not make out his speech, but that as he seemed anxious to tell us something, perhaps he could write it down. He perfectly understood what we were saying, and he took pencil and paper in a way that suggested he had a very easy task to perform. This, however, was what he wrote:

Fig. 1.

Looking puzzled, he commenced a fresh line more slowly, again the result:

Fig. 2.

at which he looked in a helpless kind of way, and then handed it over to me to see if I could make anything of it. He then started off again with his mumbling attempt at speech. I allowed him to go on for a few minutes, and then turning over a blank sheet of paper so that he could not see what he had written, I again made an experiment with his writing, and told him to write down what he wished to tell us. This time he wrote in a more deliberate manner, but with a very similar result:

Fig. 3.

and then, looking puzzled, gave up further attempts. It was plainly a case of what Professor Gairdner had termed "intoxication" with a group of letters, and evidently nothing else was to be got out of him. As the patient was by this time somewhat exhausted I desisted from further examination, and ordered absolute rest till I saw him again. His wife reported later in the day that he had remained quiet for about an hour after I left; by that time he had recovered his speech just as he did after the previous attacks. He now voluntarily commenced a conversation with his wife, remarking that the doctor had been seeing him and that he knew he had been unable to express his meaning properly at the time. He also knew that he had attempted to write something down, and asked to see the paper on which he had written. His remarks therefore proved that he was fully alive to all that had taken place at the time of his aphasic attack. Dr. Clarke saw the patient with me later in the day, our observations confirmed those of the morning's visit, and after speaking correctly for a few minutes his speech again quickly degenerated into mere "gibberish." We also determined the fact that when he spoke quite well (for example, at the commencement of our conversation) he wrote quite well. His hearing was good, and there was no "word-deafness" nor "word-blindness."

On the following day, December 15th, I again saw him, and there now was a very material improvement. He conversed with me for a very prolonged period without any flaw becoming apparent. I also showed him his writing of yesterday. He said he recognized the paper he had written on—otherwise he could hardly believe he had written it. He seemed highly amused at the composition but could give no explanation of what the letters stood for. He remembered perfectly well what he wished to tell me at the time his speech failed him; it was in regard to the details of a previous illness which, however, had no material bearing on the present attack. It is clear, therefore, that in his aphasic attacks he knew what he wanted to say but was unable to say it.

His condition now was decidedly improved as compared with that of the preceding day, there was no mental flaw, no headache and no pyrexia. Indeed it looked as if the patient were going to make an, at least, temporary recovery, but fortunately no prognosis was given.

I say "fortunately" because on the same evening insidious symptoms made their appearance, then more alarming ones, and within a week the man was dead from a clear attack of tuberculous meningitis. First he began to complain of severe headache, then his memory at times became defective; like amnesia generally, this first exhibited itself in the non-remembrance of proper names, that of his only child "Dolly" having to be constantly recalled to him.

I need not describe in detail the further progress of the case, the disturbance of vision, the alterations in pulse and tem-

perature, the subsultus tendinum, the curled-up posture as he lay in bed like a ball of wool, the ensuing paralysis, irregular breathing, deepening coma, and then the end. These were all but a common variety of symptoms of this disease. I quote the case mainly to show how all these symptoms may be ushered in by initial attacks of an aphasic nature. I regret that in this case a necropsy was absolutely denied me and that I had to rest content with the history above set forth. We may, however, form a fair estimate of the lesion in this case and in doing so, a summary of the other two cases I have referred to may prove of interest.

CASE II (Schutz).—Aphasia as an Initial Symptom of Tuberculous Meningitis.—F. W. Elsner² gives the following summary of this case, which was apparently believed to be the only example of the kind recorded up till that date.

In the *Prager med. Woch.*, No. 31, 1881, Schutz relates the case of a man who, without any other disorder than an enlarged elbow joint, suddenly got disturbance of his speech without other phenomena of paralysis. He could understand and write down words, but could sometimes not articulate words even if spoken out for him. The aphasia increased and other symptoms appeared—headache, paralysis of facial nerve and atrophy, alternating with great disturbance and excitement. On the twelfth day stiffness and pain in the nape of the neck appeared; the right eye was turned to the right and its pupil was dilated. There were facial hyperaesthesia, rales in both lungs, slight cyanosis and incontinence, coma, stertorous breathing, retention of urine, and finally death. The temperature was elevated at night to 38.6° C. (101.5° F.). It was at first thought that there was embolism of the artery of the Sylvian fissure; but as there was no cardiac lesion the idea was abandoned, and tuberculous meningitis from tuberculous bone disease, with tubercles in the brain substance near the centres of speech (third left frontal convolution), was thought possible. The brain, however, was found free at the necropsy, while there was an aggregation of tubercles and copious exudation on the pia mater of the left operculum as well as in the Sylvian fissure, less on the right side. The aphasia must therefore have been connected with the primary appearance of tubercles in the pia mater of the left hemisphere, and the histological changes which such an affection must cause in the brain substance in its neighbourhood. All the other rare cases which have had aphasia in tuberculous meningitis had the affection better marked on the left side; no other case gives it as an initial symptom, it usually appearing late. The necropsy further showed acute general tuberculosis, right lobular pneumonia, and caries of the right ulna, which was regarded as having been the starting point of the malady.

CASE III (Déjerine).—Aphasia in a Case of Limited "Tuberculous Meningitis."—This case is quoted by Bastian³ as an illustration of aphasia resulting from damage to the commissural fibres in the vicinity of the island of Reil. It will be noted that there were several transitory attacks of loss of speech, and that the symptoms were due to a developing tuberculous meningitis.

A compositor, aged 20, suffering from phthisis, was admitted to the Hôtel Dieu on May 6th, 1884. On July 16th, at 8 a.m., the Sister when speaking to him noticed that he had a great difficulty in pronouncing words. Twelve hours afterwards the difficulty had disappeared. The next morning Déjerine says, at the hour of his visit, a certain amount of motor aphasia was noticed in the patient; he pronounced with difficulty certain words and certain letters, "d," for instance, could not be pronounced. There was also a certain degree of paraphasia, but no sensory aphasia; the patient easily understood what was said to him, and what he read. He wrote spontaneously and from dictation without mistakes. His face was slightly paralysed on the right side. Speech again became normal during the day, but in the evening the aphasia was found to have returned. The next morning (18th) it was yet more pronounced, though still only of motor type, and without agraphia. The right arm as well as the right side of the face was now weak. By the following day this was still more marked, as was also the aphasia. On July 20th the patient had an attack of epileptiform convulsions; many other attacks followed at short intervals during the day, and he died comatose at 2 a.m. on the following morning. The necropsy was made with great care. The lesion was found to be a limited tuberculous meningitis, involving the island of Reil and parts of the ascending frontal and parietal convolutions, while the convolution of Broca was intact throughout its whole extent. The whole of the island of Reil was covered by a fibrino-purulent exudation, containing innumerable granulations attached to the vessels which penetrated into the brain substance, so that the subjacent white fibres must also have been affected.

It will be noted that in all the above cases of aphasia occurring as the initial symptom of tuberculous meningitis, the cerebral trouble was secondary to a tuberculosis pre-existing elsewhere. In the case of Schutz it was secondary to tuberculous chronic bone disease; in my own case and that of Déjerine to phthisis pulmonalis. In the two latter the initial aphasia attacks were also of a transitory character, and in both cases a rapidly fatal termination ensued within a week. In the cases of Schutz and Déjerine there was motor aphasia without agraphia, and the damage was apparently due to the tuberculous deposit affecting the commissural fibres in the island of Reil. In my own case loss of writing was coincident with loss of speech, and I think we may assume that a tuberculous exudation affected the motor speech centre in Broca's area. Further the lesion was of such a nature as seriously to

impair the functional vigour of the nerve cells, but not actually to destroy their integrity. It will be remembered that the transitory attacks of aphasia came on in the course of an ordinary conversation, as if the functional activity of the speech centre had become suddenly exhausted. In other words, there was an induction of rapid cerebral fatigue. This might conceivably have been produced either by direct pressure of the tuberculous exudation on the nerve elements themselves, or by an interference with the nutrient arterial supply short of actual occlusion. In any case, the patient became completely aphasic after indulging in a few minutes' conversation, and the aphasia thus produced passed off in its turn after an interval of repose. The condition, indeed, reminded me forcibly at the time of a case described by my friend Dr. Hinshelwood⁴ under the name of "dyslexia," in which his patient suddenly became "word-blind" after correctly reading a few lines of print. In his case the visual word centre or its efferent fibres became similarly exhausted and a temporary word-blindness resulted. Adopting a similar nomenclature, my case might fitly be termed one of "dysphasia" rather than "aphasia." The symptoms found in dysphasia are exactly comparable with those present in the well recognized group of cases termed dyslexia, and might further be compared with the condition described by Gowers⁵ under the term "paroxysmal lameness," in which the patient becomes intermittently lame in the course of a walk—a condition believed to depend on some arterial degeneration affecting certain portions of the cord or brain.

As a deduction from the above cases, I would insist that the occurrence of an aphasia, even of a transitory character, in a person already suffering from any form of tuberculous disease, should be looked upon with the gravest suspicion, and regarded as the probable precursor of further meningeal trouble.

REFERENCES.

¹ Bristowe, *Theory and Practice of Medicine*, 5th ed., p. 985. ² Elsner, F. W., in *London Medical Record*, August 15th, 1882. ³ Bastian, C., *Aphasia and Other Speech Defects*, p. 241. ⁴ Hinshelwood, J., "Dyslexia, a Peculiar Form of Word-Blindness," *Lancet*, November 21st, 1896. ⁵ Gowers, *Diseases of the Nervous System*, vol. 1, p. 297.

A NOTE ON SOME CASES MISTAKEN FOR SMALL-POX DURING THE RECENT EPIDEMIC.

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DURING the last twelve months about 1,400 cases of small-pox were treated at this hospital. About 60 persons were sent to us as suffering from small-pox who on examination were found to be the subjects of some other disease. Chicken-pox alone accounted for one-half of these. In the case of not a few of the patients suffering from this disease it was observed that the eruption on the arms and legs, when it was present to any extent in these situations, was characterized by a certain hardness of the individual elements which was almost indistinguishable from the so-called "shot-tiness" of the variolous papule, and conveyed the impression of a lesion situated pretty deep in the skin. This phenomenon may in a measure have been responsible for the failure to identify the disease. In varicella one quite frequently meets with the phenomenon in question.

Four cases were found to be suffering from acne. The case of a female patient, aged 15, was one of these. She happened at the time to be in the third week of an attack of scarlet fever, and was desquamating freely. On her arrival at hospital, she complained of pain in her limbs, which appeared to be of a rheumatic nature. She had had none of the prodromal symptoms of small-pox, and had been successfully revaccinated six months previously. The eruption was plentiful, but discrete and pustular, and most pronounced on the neck and shoulders, and between the scapulae some of the pustules giving to the finger-tip an impression of firmness.

Other instances of mistaken diagnosis were one case of impetigo in a vaccinated child, aged 4; scabies—one case, that of an ill-nourished child, aged 6, with four good vaccination marks, and one case of urticaria in a well-vaccinated child, aged 7.