exactly on all fours with Case No. xcvi in Dr. Osler's admirable little work on *The Cerebral Palsies of Children*. Polioencephalitis, cortical venous thrombosis, embolism, meningeal hæmorrhage, capillary hæmorrhage, are all rivals in the field. Elsewhere I have given a few reasons for thinking that all spastic palsies in children are the result of a cortical lesion produced by meningeal hæmorrhage; and I find, on the authority of Nothnagel² that, in thrombosis of cerebral veins, it is not uncommon for rupture of the vessels to occur, causing hæmorrhage into the meninges.

In infantile cerebral palsy the rule is that there be some degree of spasm of the palsied muscles; here, as in three cases of Dr. Osler's, there was none. Whether this depends on a different locality of the lesion, or upon the more perfect recovery of the once damaged brain cells, I do not know. In this case, as in No. iv of mine,³ the right great toe was kept turned upwards and backwards. According to D'Espine, this is due to the unbalanced action of the extensor proprius, the plantar arch falling through the paralysis of the peroneus longus; and I have since noticed the same in apparently a genuine case of Erb's primary spastic paraplegia in both toes. In both these cases, and in No. iv above mentioned, the affected limbs were colder than the sound ones, and the same is noted by Dr. Osler in his cases LXVII and LXX. This is not nearly so marked as in acute anterior poliomyelitis. It simply follows, I suppose, from their being old cases of hemiplegia, as Dr. E. L. Fox points out, that the palsied limb appears colder than the other. Whether this be due to chronic irritation of the cortical centres (of Eulenberg and Landois), which, according to these observers, influence the vascular state of the limbs, to the palsied muscles needing less blood, or to the muscles manufacturing a less amount of heat, is beyond my present purpose to discuss.

HEMIPLEGIA ACCOMPANIED BY LOSS OF SPEECH IN CHILDREN.¹

By THOMAS OLIVER, M.A., M.D., M.R.C.P.,

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APHASIA is always an attractive subject, particularly in children. The diseased condition which gives rise to it occurs in them at a time when development is incomplete; when organisation of certain parts of the brain is taking place, and upon whose healthy functional activity depends the power the individual has of giving expression to intelligent thought.

On August 6th, 1888, I was asked to see in consultation O. H., a pale-faced delicate child of 2½ years of age. She was a twin, and the more delicate of the two, owing to her having suffered from recurrent attacks of cold. Her father and mother are healthy, and there is no history of tubercular disease in the family.

The child had been apparently quite well until three weeks before I saw her. She had caught cold; this was followed by bronchitis. The bronchitis had passed away, and she had made, it was thought, a satisfactory recovery. She had got again into the habit of walking about the house when, one day—five or six before I saw her—she was found lying helpless on the scullery floor. Lifted by her mother, and placed upon her feet, she at once fell, and it was then only too apparent that this complete inability to stand was due to paralysis of the right side of the body. She had lost, too, her power of speaking. These symptoms continued. Within the next few days tremor of the right hand developed, which gradually passed into strong convulsive movements, affecting both sides of the face and the body generally. During the week previous to my seeing her she had not spoken; she simply expressed her wishes by pointing with her left hand. The right arm by this time was passing into a state of extreme rigidity with spasm; it had been carried back behind the trunk, was directed outwards, whilst the hand was twisted round and bent upon the wrist. The right leg was held out in a state of extension and rigidity; the big toe all the while bent and pointing upwards. Though the arm and leg were in a condition of rigidity and spasm—almost permanent—yet from time to time the spasms relaxed. Particularly was this the case so far as the fingers and the knee and ankle on the right side were concerned. From a con-

dition of relaxation the limbs would at once pass suddenly into a state of spasm, the act being evidently accompanied by a great amount of pain. There was complete absence of the knee-jerk on either side; the plantar reflex was slightly exaggerated. The pupils were equal. Temperature was normal; it had never risen. Vomiting had been present prior to the seizure, but none since. Headache, if ever present, had never been complained of. Pulse 106. Tongue moist; clean. All over the chest numerous small rhonchi were heard. Heart was healthy. We diagnosed meningitis, affecting principally the motor areas of the left side of brain. On August 31st the child died, never having regained speech or the use of the right arm and leg.

At the *post-mortem* examination considerable difficulty was experienced in removing the calvarium, owing to strong adhesions existing between it and the dura mater. This membrane was found to be thickened, and where it was adherent dense bands of fibrous tissue were seen radiating outwards from either border of the longitudinal sinus. The walls of this sinus were thickened, and a large, firm, dark clot occupied its interior. The vertex of the brain was bright and glistening. A clear gelatinous fluid occupied the subarachnoid space, particularly in the upper part of the so-called motor areas on the right side of the brain and over the whole of the motor area on the left side, where it was most marked over the third anterior inferior frontal convolution. On careful examination it was noticed that this effusion pressed chiefly upon the lower half of the left ascending frontal convolution and the whole of the third anterior inferior frontal convolution. The convolutions, taken as a whole, were softened. At the base of the brain the vessels were healthy, as were also those traced deeply into the fissure of Sylvius. The white substance of the right half of the cerebrum was found on section to be quite firm and healthy to the touch; that on the left was softer and showed many more and much larger puncta hæmorrhagica. The substance of the convolutions of the left motor areas was extremely soft. About 3 or 4 drachms of bloody serum occupied the left lateral ventricle. The left internal capsule was extremely soft compared to the right. The rest of the brain was healthy.

A vertical meningitis, followed by effusion, pressing upon and irritating chiefly the left motor areas and Broca's lobe is, in a word, the pathological condition that existed, the doubtful cause of which was an injury received by the child some months previously to her death.

That the meningitis stood in a causal relationship to the loss of speech in this case there cannot be the least doubt, and it is a good illustration of "irritative inhibition" of the speech centre, the function of which was just as completely destroyed as that of the motor areas, evidence of which was seen in the paralysis of the right arm and leg. Had the child's life been spared, the right arm and leg would have remained paralysed, and their growth would have been retarded, and the lesion would have been regarded as a polioencephalitis. Speech might have been regained through development of the right side of the brain, and the assumption by it of the word-making function. This case is interesting as showing at what an early age "duality of brain" was completely established, the association of right-handedness with left cerebration, and the developmental interaction of these two as regards the function of speech.

2. *Left-sided Convulsions, followed by Hemiplegia and Aphasia, in a Child aged 5½ Years.*—This little patient I saw in consultation with Dr. Russell, of Heaton, to whom I am indebted for the notes of the case. He first saw the child on August 9th. Until the middle of the preceding month her health had been good; she now began to lose her appetite, and became extremely irritable in her temper, was feverish at night and her memory and speech became gradually affected. She was no longer able to walk, staggered much and fell frequently. There was a history given of a fall down stairs a year previously, and of the patient having been rendered unconscious for one day, and at the present time the cicatrix of this bruise is seen over the upper part of the left frontal bone.

On the day previous to that on which Dr. Russell saw her she was very noisy; during the night she had slept badly and was delirious. In the morning severe convulsions set in. The patient, who was a well developed child, was found convulsed, generally and in a severe manner, but the convulsions were much more severe on the left than right side of the body. There was strabismus, also twitching of the muscles of the face, dilated and unequal pupils, the left being the smaller; neither of them responded to light; pulse 52, and irregular; heart healthy; a few mucous rales

² Ziemssen, xii, 13.

³ *Practitioner*, February, 1889.

¹ Read in the Section of Diseases of Children at the Annual Meeting of the British Medical Association held in Leeds.

over base of each lung posteriorly; temperature 98.2°; head was shaved, ice applied: calomel and jalap, and bromide of potassium administered. In the evening she was quieter; pulse 80; temperature 98.2.

August 10th. Convulsions all but ceased; pulse 90; temperature, 99.4°.

August 11th. Passed a good night; has taken liquid nourishment; convulsions entirely ceased; left arm and leg are noticed to be powerless; pulse 84; respirations 42; temperature 98.8°. Urine and feces have been passed involuntarily for the last three days.

August 12th. Is still improving, although consciousness has not quite returned. Since the commencement of this illness, she has been speechless until to-day. She now attempted talking, but her speech consisted in a frequent reiteration of the word "cake," a word incessantly repeated all the time she was awake.

August 14th. Is more conscious. The word "cake" is repeated incessantly either as the answer to a question or when left unheeded. She understands, however, what is said to her.

August 16th. Improving. Called her sister by name once, and thereafter fell into her habit of repeating the word "cake."

August 18th. Vocabulary is increasing; used the word "mother" to-day.

August 24th. The word "cake" is no longer repeated; can talk fairly well now, but is very irritable, and drags the left leg in walking. Pot. iodi. and mercurial inunction to head.

September 19th. Patient is now almost well, save for a degree of paralysis of left side. Memory is good, and she now talks well.

In another month the hemiplegia had entirely disappeared; patient made a good recovery.

Both of these cases have many points of interest. In the first, we notice a very extensive lesion of the membranes, followed by a highly-developed right-sided spastic hemiplegia; and in the second, the occurrence of left-sided hemiplegia with aphasia in a child not left-handed, and the almost continuous repetition of the word "cake." We could obtain no proof that this was the last word uttered by the child before the onset of her illness. And then there is the relationship of left-sided hemiplegia with aphasia. The child had not yet learned to write, and consequently it might be said there had not occurred that incitement to the organisation of the faculty of speech in one hemisphere more than the other. Some have raised the question as to whether, in young children, organisation of speech is not always bilateral, and whether its full development and subsequent localisation in one side of the brain are not determined by the use of the hand in writing. The notes of my first case show, at any rate, that speech can be lost by a lesion, chiefly one-sided, and that, too, before the art of writing is learnt.

THE PARALYSES OF CHILDHOOD.

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CEREBRAL disease in the first two years of life is less frequent than is generally supposed. It is rare to meet with hemiplegic symptoms at that age; unequal action of facial or ocular muscles results more from disturbances of reflex function or of local nutrition, while convulsive attacks are the result either of spinal irritation or of cerebral anæmia, or of both, and are at this age seldom indicative of mischief in the brain; even coma and the slighter degrees of unconsciousness may persist for hours without the co-existence of cerebral pressure, and the fear of a tubercular meningitis that accompanies these symptoms is mostly groundless, for tubercle hardly occurs here so soon, and sometimes the means adopted to ward off a visionary evil of this kind intensifies the morbid condition really existing. The brain is relatively quiescent during this period of development, while the spinal system is most active, and the more readily becomes the seat of organic lesion, specially of the one resulting in a poliomyelitis of the anterior cornua, known as infantile paralysis. It is true that a poliomyelitis at any part of the brain or spinal cord may occur after many of the acute diseases in later childhood, and when of limited extent may cause a similarly sudden and permanent paralysis. This sometimes happens after diphtheria, but that it

is not a frequent accident, and certainly not the one usually associated with diphtheritic paralysis, is shown by the varying group of muscles affected by this kind of paresis, and by its tendency to recovery; moreover, the degenerative changes, both of nerve and muscle, so frequently associated with these local paralyzes explain their pathology, and I have only to add that, in my experience, they are less frequent and of less duration in the first two years of life than afterwards. In both, after the first symptoms are over, electric stimulation, friction, and tonics, such as strychnine, are useful; while in infantile paralysis the early and careful adjustment of mechanical compensations and methods of assistance is imperative.

Only one case of spastic paraplegia has come under my notice; it serves to increase the preponderance of spinal disease in the causation of paralysis in infants. The onset was sudden, and convulsions marked the early stages of the disease. From those symptoms, beginning the day after birth in a well-developed first-born boy, a spinal hæmorrhage was assumed as the cause. At first the legs were only extended as convulsive seizures occurred, with some opisthotonos. Afterwards the thighs were held in a line with the body, and any attempt at flexion brought on a convulsive seizure. The legs were steadied with bandages and cotton-wool; bromide of potassium and chloral hydrate were given by enemata, and chloroform inhaled. When at rest the child could take the breast. After a time the legs could be moved a little without exciting spasm, but they continued rigidly extended, and were not moved voluntarily. The first teeth appeared without trouble, and then, after forcible flexion of the leg and thigh under chloroform, gradual improvement was brought about without division of tendons. Some power over the sphincters was gained, but the power of walking was still imperfect when I last heard of the child's progress.

My four cases of infantile palsy, two boys and two girls, are taken from well-to-do families (all classes are equally liable), the notes at hand being more complete than in some other cases. One of them occurred to a boy under 2 years old; before I knew the pathological lesion to be a poliomyelitis of the anterior cornua of the spinal cord, the attack was considered as one of acute cerebral congestion, and at first the loss of power was looked upon as hemiplegia. Most of the left side was affected, but soon power of movement was restored in the leg and hand; only the deltoid remained palsied. In all cases the attack was sudden; only one had any convulsive seizure at the outset. One, a weakly girl, was seized with vomiting; but this soon ceased, and there was very little fever. A double tooth on the left side was supposed to be concerned on very slight grounds; the gum was lanced, but the tooth was slow in appearing. The paralysis affected the right leg and hip at first, preventing the child sitting up. Eventually only the tibialis anticus and peronei were left useless; the foot dropped, the limb was always colder than the other, and its growth checked. Mechanical aids after division of the tendo Achillis, a raised shoe, and crutches were adopted; the latter are used now with much facility and even elegance.

Another case similar to this occurred with febrile symptoms to a healthy girl who manages very well with a high shoe; here the helpless leg soon explained the nature of the illness, as she had previously been able to stand and walk: warmth and friction to the limb, with various means of artificial support and movement, kept up a fair balance of muscular power; the constant current seemed to stimulate the cutaneous circulation after other electric stimulus was discontinued.

The fourth case was that of a delicate boy a year old with sudden nervous symptoms, twitchings of the facial and ocular muscles, but no squint, no vomiting nor obstinate constipation; as the attack passed off one arm hung flaccid to the side, eventually only the deltoid remained palsied. Warm covering, friction, support and movement of the arm and shoulder muscles were constantly attended to in this as in the first case, and here electricity was long used as one way of exercising the surrounding muscles. Both the boys became adepts at raising the arm, and then all kinds of gymnastic evolutions were possible. No deformity resulted in either of these two cases. Three of these cases occurred in hot weather towards the end of summer; in all the febrile attacks (as in pneumonia) preceded the local lesion which was in neither case at all proportionate to the severity of the seizure; nor did age, within the narrow limits of two years, influence either the one or the other; no special fever is concerned, for we have a similar lesion after various fevers, though not confined to the anterior cornua of the cervical and lumbar portions of the cord as in these