NOTES AND REMARKS UPON A CASE OF VILLOUS TUMOUR IN THE FOURTH VENTRICLE.

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THE following case seems worthy of record, both on account of the clinical points of interest which it presents, and also as an example of rare pathology. With the permission therefore, of the Medical Superintendent, Dr. E. Marriott Cooke, I venture to publish the following summary of the notes on the case, and to append a few remarks.

W. S., a lad aged 17; admitted July 12th, 1884. For several months, probably at least for six, before admission there had been some failure of sight and blunting of the mental faculties. During the last few weeks a reeling gait had been noticed.

Notes on Admission.—He is a thin, pale boy, of a tubercular aspect. His lungs and heart act normally. Urine contains $\frac{1}{2}$ albumin, no blood, casts, epithelium or sugar. No apparent palsy of legs or arms. He can grasp, pick up fine objects, and, whilst recumbent, can perform voluntary co-ordinated movements with the legs. When, however, he gets up to walk, he reels (usually towards the right), hurries forward in an uncertain way, and soon stumbles and falls to the ground, unless he reaches some object to which he may cling for support. Says he feels "giddy," and has a pain at the back of his head. His reeling gait is the same, whether his eyes are open or shut. The reflexes, superficial and deep, are normal. His right arm and hand, and occasionally also the left, are subject to attacks of tremor, which, however, he can control to perform a voluntary act. There is no palsy of facial, lingual, or pharyngeal muscles. He sees very badly, looking always to his own left of the object to get a view of it. If one covers his right eye, the left pupil dilates to the full and is insensible; on uncovering the right eye, the left pupil immediately contracts to about the normal size. Right pupil responds, though slowly and imperfectly, to variations of light and accommodation. The left eye is quite blind. With the right he can see an object if it is held on the outer, or lower side, of the eye. Ophthalmoscopic examination reveals

extensive neuro-retinitis; the left disc is very white and atrophied; the right less so; many white patches are scattered over the fundi, least numerous on the inner and upper parts of the right. The boy hears badly, especially on the left side. The external meatus and the membrana tympani appear normal. Senses of smell and taste unaffected. Ordinary sensation of touch, heat, cold, and electric stimulation are normal. His head is bulged in the temporo-parietal regions. Temperature normal morning and night; pulse 66; respirations 16.

Mental Condition.—All that need be said to describe the state of his mind is that he is in a state of hebetude; he is dull, heavy, and sleepy; rarely speaks, unless roused by shaking, when he can give a better account of his symptoms than one would expect. He says usually, "I am much better," and is of opinion that if discharged from the Asylum to-morrow, he could at once work and earn a livelihood.

These notes give a fair idea of the boy's state when he came here. I may say that the diagnosis arrived at with regard to the cause of his symptoms, was that he had some lesion of, or affecting, the middle lobe of the cerebellum. The exclusion of locomotor ataxy was easy; the absence of pains in the back or legs; the fact that he could perform co-ordinated movements when lying down; the presence of the deep reflexes; the fact that sensation in the legs was neither delayed nor perverted; and the very early sight failure;—were, though not of necessity individually, certainly when taken together, strongly negative to a primary cord lesion. Of cerebellar lesion, on the other hand, there was evidence both *direct*—reeling gait without disorders of sensation, pain, or true "ataxy," and *indirect*—occipital pain, mental hebetude and neuro-retinitis. Another symptom existed also to a marked degree, which has been the subject of debate and experimental research in its relations to cerebellar lesions, viz. constant priapism.

The progress of the case can be summed up in a few words. The reeling gait gave way gradually to a helpless, paralysed, bed-ridden state; the sight failure passed into total blindness; complete deafness soon followed, and the hebetude passed into a condition of complete unconsciousness. A high fever (102°–106°) supervened; and when this had persisted for about a week, without any lung or other inflammation to account for it, coma and death ended the scene, thirteen weeks after the admission of the patient. For several hours before death, "Cheyne-Stokes" respiration was noticed.

An autopsy was held, of which the following are the notes:—Heart, liver, kidneys, spleen, normal; some pulmonary con-

gestion. On opening the skull, the veins over the vertex of each hemisphere were seen, dark and distended, lying, like earth-worms in appearance, over the sulci. The convolutions of all parts of the cerebrum were very markedly flattened against the skull. Membranes were slightly opalescent, but free. Lateral sinuses full of black clot. Sub-arachnoid fluid very abundant. Brain normal on section, excepting that the grey cortex was thin and very pale. The fourth ventricle was bulged and greatly enlarged by a tumour, the size of a bantam's egg, which lay filling the enormously dilated cavity. The walls of the ventricle were smooth and shining, and nowhere encroached upon by the growth, which was freely movable, and attached only to the roof of the ventricle by two delicate strands of membranous connections, conveying vessels, &c., to it. The tumour in appearance resembled a large purple mulberry; was very soft and gelatinous in consistence, breaking away readily before the touch. No visible changes existed on section of the pons, medulla, or cerebellum. The velum interpositum was thick, and the veins of Galen enlarged. The "iter e tertio ad quartum" was dilated to size of a quill, and the lateral ventricles enormously distended with fluid.

The tumour was carefully preserved and sent to Mr. J. Bland Sutton, of Middlesex Hospital, for examination. He reports as follows:—"It was impossible to obtain a microscopic section of the growth, as it fell to pieces on being cut, so that one was obliged to tease it out and examine it piecemeal. It is a villous growth, and agrees in structure with the fringes of the choroid plexuses of the ventricles. It has a basement membrane of well-defined connective tissue, with coils and loops of vessels entering into out-standing villi, crowned with spheroidal cells, squamous-looking in places."

I venture to call attention especially to the position, structure, and size of this tumour, in all of which particulars it is uncommon. Mr. Jacobson, in his edition of "Hilton on Rest and Pain," mentions a case very similar. He describes the tumour in his case as "papillose," its position as "in the floor of the fourth ventricle," and its size as "that of a small hazel nut." In my case, the growth was not "in the floor," but was free in the cavity of the ventricle, and was apparently ten or twelve times as large as in Mr. Jacobson's. The same authority refers to two "remarkably similar cases," given by Virchow. As in his case, so in mine, the effect of the growth was to close the cavity of the fourth ventricle, thus preventing the exit of fluid from the interior of the brain. The tumour, in the case of which I write, was so large that it completely blocked the cavity of the fourth ventricle, and thus prevented fluid from

the laterals from escaping, when necessary, through the "iter e tertio ad quartum," which was itself dilated largely, as far as its lower opening, a fact which evidences the amount of pressure above. The accumulation of fluid in the cerebral ventricles was also perhaps increased and hastened by the obstruction afforded by the tumour to the return of blood from them along Galen's veins. Great distension of the ventricles resulted, and hence the compression of the brain outwards against the skull, which caused the dementia and ultimate coma. The cerebellar symptoms mentioned in the notes of the case may be accounted for by the fact, that the tumour pressed upon the middle lobe of the cerebellum, which was during life diagnosed as the seat of lesion. Resting as it did upon, and irritating the posterior parts of the medulla oblongata, it caused the constant priapism; Eckard has produced experimental evidence pointing to such a conclusion. The difference which existed in the hearing powers of the two sides is difficult to account for; doubtless, however, the deafness and the vomiting which occurred depended upon immediate irritation of the roots of the auditory and pneumogastric nerves in the floor of the fourth ventricle. The wonder is that a growth of such size could have existed where it was without causing earlier grave interference with the vital functions of the medulla; possibly it grew very slowly, and the medulla accommodated itself to circumstances. The very early sight failure is attributable to the direct pressure of the tumour upon the corpora quadrigemina.

The high pyrexia which occurred is interesting. No signs or post-mortem evidences existed of inflammation either within the skull or elsewhere. Its occurrence in cases of simple tumours within the skull is on previous record; and apparently the importance of the proximity of the growth in this case to the presumable site of the hypothetical heat-regulating centre is diminished by the occurrence of pyrexia in cases of intracranial tumours situated remote from the medulla. Be the heat-regulating centre where it may, does not the increase of the body-heat in cases such as this, unaccompanied by any discoverable lesion of an inflammatory nature, point forcibly to the importance of the nervous factor in the production of pyrexia?—to an inhibitory power exercised in health by the high centres over metabolism, the "paralysis" of which power allows tissue-change to run riot, and a rapid combustion to ensue, attended by high fever, and the wasting which, during the last stages of this boy's life, was surprising in its rapidity.