A CASE OF APOPLEXY OF THE CEREBELLUM.

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APOPLEXY is a disease of so frequent occurrence that some apology may be necessary for submitting to the notice of the Society the details of an individual case. Still every contribution to the pathology of the nervous system is important, and individual cases become invested with a special interest, where the opportunity has been afforded of watching the patients during life, and of investigating the pathological conditions after death. It too often happens that fatal cases of apoplexy present us with no previous history for afterthought. We are suddenly called, the patient has been as suddenly seized;—the loud or deep stertor and profound coma may indeed at once reveal to us, on our approach, the real character of the disease before us, and the post-mortem inspection (when it can be obtained) demonstrate the seat of the rupture, and the extent of the effusion; but the previous history is wanting to give to these their full significance.

The subject of the present communication was a man 52 years of age, of a spare habit, and nervous temperament, of considerable mental energy, and active business habits. He was by trade a printer and publisher. For many years he had been afflicted with an amaurotic affection, which had materially impaired his sight, and latterly to such an extent, that he could recognise his friends only when they were very near to him, and could not read without the aid of a magnifying glass.

I was first called to attend him in June 1843, though,

for several years, as the medical attendant of his family, I had had constant intercourse with him. He was then suffering from an attack of cephalæa. The pain through his temples was agonising, and there was considerable febrile disturbance. As he had some time previously been under the care of Mr. Guthrie for his eyes, and was seriously alarmed about them, I had the benefit of a consultation with Mr. Guthrie on his case. Under the influence of topical bloodletting and a strict antiphlogistic treatment, the attack subsided, but the sight was more impaired, and it was long before he regained his wonted energy and strength. About two years ago he became unfortunate in business and embarrassed in his pecuniary affairs. The anxiety and harass of mind to which he was subjected, under a commission of bankruptcy, shook his whole nervous system, and he had never afterwards the same physical energy as before. Despondent and subject to emotional excitement on the slightest occasion,—bursting into a flood of tears when allusion was made to his wife and family, to whom he was tenderly attached,—he lost his former aptitude for business, became irritable in temper, and lethargic both in body and in mind. His mental powers seemed weakened, and his memory was greatly impaired; indeed to such an extent that he not unfrequently forgot the very business he had purposely left home to execute, and if he happened to have two commissions on hand, he generally forgot the more important one.

Such had been the general state of his health for some months, when I was hastily called to him in the morning of the last day of April of the past year. He had been seized with sickness and faintness during the night, and on getting out of bed to pass water had fallen down, as it was thought, in a fainting fit. I found him low and exhausted, with a feeble pulse, and a cold clammy perspiration upon the surface of the body, complaining of sickness of stomach, and of pain, heat, and uneasiness in the back part of his head. I gave him ammonia with Hoffman's anodyne, and he rallied in the course of the day, but the pain, heat, and uneasiness of the head continued for some days afterwards. There was

no paralysis on either side, but there was about him a hurriedness of manner, great restlessness and irritability of temper. He did many strange and unaccountable things, such as getting up in the middle of the night and putting on his clothes, then going to bed again half dressed, and other like vagaries. His emotional excitability had increased, and was at times distressing to every one about him. His appetite was good, better than it generally had been, and it continued good up to the time of his death, but his mental faculties were evidently becoming weaker, and I was strongly impressed with the conviction that he was the subject of ramollissement of the brain. I had a consultation on his case with Dr. Cobb. on the 3d of May. A few days afterwards his wife told me with great delicacy and embarrassment of manner that he had become the subject of a constant desire for sexual intercourse. His behaviour in this respect was so different from what it had been, and so little amenable to persuasion or reason, that she said necessity had induced her to speak on the subject to me. I at once recommended his removal from home, and succeeded in persuading him to pay a visit to some friends in the country without his wife, on the plea that a change of air and scene was essentially necessary for the re-establishment of his health. He left London on the 14th of May, and was absent about three weeks.

He returned looking better, apparently improved in his general health, and no longer, as I afterwards learned from his wife, a slave to the sexual propensity. In this respect he had greatly changed. The desire for sexual intercourse had abated, and from this time it gradually became less and less to the period of his death, which took place on the 6th of September following. In the interval his health seemed stationary, but there was observed an unsteadiness in his gait, which visibly increased, and amounted at times, under the influence of emotional excitement, to the staggering of a drunken man; and for some time before he died he had a settled weakness and stiffness in the left leg and foot. He was apathetic and lethargic, sleeping half his time away, with less aptitude and greater indifference for business.

On the 6th of September after having eaten a hearty

dinner, he was seized with severe pain in the back part of his head. He described the attack, after rallying a little, as though he had received a sudden blow upon the part. It was immediately followed by faintness, sickness, and vomiting. He brought from his stomach all he had eaten, and rallied a little, so far as to request that I might be sent for, and to be able to describe how he had been attacked. Soon afterwards he became restless and irritable, and then had a severe convulsive rigor, which was followed by coma with stertorous breathing, and a feeble, fluttering pulse. He gradually sunk and died in less than four hours from the time of the attack.

Post-mortem examination, forty hours after death.—The vessels on the surface of the brain were found distended with dark black blood. The brain itself presented an unhealthy aspect. The convolutions shrunken in size, and wanting firmness of texture, were of a dingy yellow hue, approaching to the colour of whity-brown paper.

The optic nerves had the same shrunken character, and dingy hue, and on tracing them from the chiasma through the optic tracts into their cerebral connexions, they and the surrounding substance were found to be in a state of whitish gray softening; the whole region of the mesocephale had an unhealthy aspect, and on its outer surface were seen patches of the same whitish-gray degeneration. The anterior of the right hemisphere of the cerebellum had become a softened pulpy mass, in the midst of which was found an apoplectic clot, of the size of a pullet's egg, from the rupture of one of the branches of the vertebral artery. The softening had extended inwardly beyond the centre of the median lobe, implicating the fibrous strands of the middle and inferior planes in the destructive process, and outwardly so near to the surface of the hemisphere, that a portion of the apoplectic clot was projecting through it. Some extravasated blood was found in the lateral ventricle, especially on the right side. The whole arterial system of the brain was more or less in an unhealthy state, presenting that diseased condition of the vessels which results from cartilaginous and ossific deposition between their coats. In the

vertebral arteries this was remarkably apparent :—there was seen, at very short distances from each other, a succession of osseous rings, while on the right side the vessel was enlarged, and upon its cerebellar branch, in which the rupture appeared to have taken place, there were whitish raised patches of cartilaginous deposits. Such a condition of the vessels, from the disturbance it would occasion, in the circulation through the brain, must have given rise to great functional derangement, and was, in all probability, I think, the primary cause of disease. The case presents an apt illustration of that second form of apoplexy, which Dr. Abercrombie has so admirably portrayed, and it offers some points of curious interest, which from their physiological bearing deserve consideration.

And 1st, as to the nature of the attack which the patient had on the last day of April. From the diseased condition of the arteries of the brain, and from the symptoms at the time, there is every reason to believe, that the attack, though slight, was of the same nature as that of which he died. But, whatever may have been its precise character, one thing is certain, that from this time symptoms of an inflammatory kind pointed to the back part of the head, as a *seat* of disease, for *pain, uneasiness, and heat of surface* were localized there. It is no uncommon thing to find in a central part an apoplectic cyst surrounded by softening of the adjacent substance, and we know that the consecutive inflammation which accompanies hemorrhages and direct extravasation, leads to cerebral degeneration as a consequence.

2d. The condition of the cerebellum viewed in connexion with the history of the case, is full of interest. For while it is obvious that such an extensive disorganization of its internal structure must have destroyed the integrity of all the functional powers of the part, it is highly interesting to note, during the progress of the degeneration, first, the exaltation and subsequent depression of the generative function, and secondly, the tottering gait, from the defective power of co-ordination, ending in a weak and stiffened limb.

It is true that emotional excitability was a prominent

feature in his case, and that the mental faculties became much impaired. The pathological condition of the mesocephale and of the great hemispherical ganglia may be adduced in explanation of these symptoms, but the extraordinary excitement of the sexual passion was a sudden invasion, and manifesting itself as it did, so soon after his seizure in April, the inference appears to be indisputable that it was a consequence of that attack, and dependent upon the irritative stage of that destructive disturbance of the cerebellum which led to such extensive degeneration of its structure.

This is not the only case in which from personal observation I have been able to associate exaltation and subsequent depression of the sexual propensity with opposite pathological conditions of the cerebellum; the first, with irritation and incipient inflammatory indications, and the latter with degeneration and abscess.

In one instance, which came under my notice some years ago, the patient, though doatingly fond of his wife and children, and in every other relation of life an exemplary man, could not restrain the sexual passion, and I had him two or three times to treat for gonorrhœa,—on one occasion, during the period of his wife's accouchement. He wept over his delinquencies. In his case, at the latter period of his life, and after all erotic manifestations had passed away, he had not only a tottering, but a stooping gait, and required a walking-stick for support in progression. After death there was found an extensive softening in the middle and one of the lateral lobes of the cerebellum, as well as superficial ulceration of the glans penis, and atrophy of the genital organs.

These cases point to another function of the cerebellum, and connect the motor phenomena and the defective co-ordinating power in maintaining the equilibrium of the body, with the deep-seated disorganization of its fibrous structure. To my mind, the evidence from pathology and comparative anatomy is irresistible, that the cerebellum is subservient to the co-ordination of voluntary and locomotive actions. It has been well observed, "No other part of the

encephalon has such extensive connexions with the cerebro-spinal axis. It is in union with each segment of the great nervous centres upon which all the movements and sensations of the body depend. The antero-lateral columns of the cord, and the anterior pyramids and olivary columns, supplying all the anatomical conditions necessary for the development of acts of sensation and volition.”* It is intimately associated with the optic, the anterior and posterior cerebral, and the great hemispherical ganglia, through the medium of the inter-cerebral commissure.

At the same time, it is admitted, we have little exact knowledge of its intimate structure. The complexity of the organ, consisting as it does of a series of ganglia, involves the belief of a plurality of functions, and one thing is certain, that the median lobe is *primitive* and *fundamental*, and that it exercises an *independent function*, since in the lower classes of the animal series up to birds, *the lateral lobes do not exist*. This fact, though fatal to the hypothesis of Vimont, which locates the sexual instinct in the lateral hemispheres, does not affect the allocation of Serres, who, from pathological researches, fixes its seat in the central lobe, in support of which my own cases may be adduced as corroborative proof. It cannot be disputed that the generative instinct is primitive and fundamental; and seeing that we have distinct olfactive, optic, and auditory ganglia, à priori reasoning inevitably leads to the conclusion that the instinct of propagation, one of the most universal instincts in nature, and having for its object the perpetuation of the species, should have a special sensory ganglion of its own. This sensory ganglion of the sexual instinct I would rank in the same category with the optic, auditory, and other sensory ganglia; and to its allocation in the central lobe of the cerebellum, I can see no valid anatomical or physiological objections. I cannot subscribe to the opinion that “the generative function is scarcely such as to require in its central organ connexions so extensive as those possessed by the cerebellum;” nor to the notion that, for the manifesta-

* Dr. Todd and Mr. Bowman, *Physiological Anatomy and Physiology of Man*.

tion of this complex propensity in man, "it is not likely that its organ would be connected with any other part of the spinal cord, than that from which nerves are derived to the organs of generation."*

In the consideration of this subject we must not lose sight of the distinction between *instinct* and *propensity*, which has been so clearly pointed out by my friend Dr. Carpenter in his able analysis.

"*Instinct* being our expression for a certain series of phenomena directed towards a given purpose, but not really involving any other physiological or psychological actions than sensations and respondent movements, and *propensity* being a *desire* for *gratification* involving an *idea* of the object;" it follows, as Dr. Carpenter has justly observed, "that the *absence of the cerebellum* in insects is not inconsistent with the doctrine of *Gall*, since their sexual actions may be purely *consensual*; neither is it opposed to that of *Flourens*, for all these movements are evidently of a *consensual* and *reflex* character."

I think, with Dr. Carpenter, that the sensory ganglia are evidently the instruments by which instinctive and consensual actions are performed, and that they are also the seat of the simple or elementary feelings of pleasure and pain, connected with their respective functional endowments. And thus in the lower tribes of animals, whose instincts are not restrained or directed by intelligence, the sexual instinct is exalted into action by the direct operation of internal sensations, and all the respondent movements are consensual. *Where there is no cerebrum there is no cerebellum.* But where the desire for the gratification of the sexual propensity involves both sensorial pleasure and an idea of the object, we there find both *cerebrum* and *cerebellum*, and in the latter a *sensory ganglion*, in most intimate connexion with the *great centres of sensation and emotional feeling*, and through them, with *those of intellectual action*; thus affording, from its anatomical and physiological relations, a ready and satisfactory explication of the complex character of the amative propensity in man.

* Todd and Bowman, loc. cit.