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Case of tubercles of the brain

by
Robert Dunn.

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C A S E

OF

TUBERCLES IN THE BRAIN:

WITH REMARKS,

PHYSIOLOGICAL AND PSYCHOLOGICAL,

ON THE

Functions of the Nervous Centres involved in the Disease.

BY

ROBERT DUNN, F.R.C.S.ENG.

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CASE OF TUBERCLES IN THE BRAIN:

WITH REMARKS PHYSIOLOGICAL AND PSYCHOLOGICAL ON THE
FUNCTIONS OF THE NERVOUS CENTRES INVOLVED
IN THE DISEASE.

IMPRESSED with the conviction that every contribution to the pathology of the nervous system is important, I need offer no apology for placing upon record, in the pages of the ASSOCIATION JOURNAL, the following detail of a case of Tubercles in the Brain which has lately come under my observation.

We are all under great obligations to my friend, Mr. H. Ancell, for his able and profound exposition of the subject of Tuberculosis; yet, it must be acknowledged, there is still much truth in the remark of M. Lugol, "that the diagnosis of cerebral tubercle is involved in the greatest obscurity". I hope, therefore, that others will follow my example, and place upon record such instances of the disease as may come under their notice; so that the obscurity, if possible, may be lessened, if it cannot be entirely removed. It has not unfrequently happened, as in the present instance, that cerebral tubercles have been met with in *post mortem* inspections, in cases in which their existence during life had not been suspected. They have very rarely been found in adult life; and Abercrombie, in his work on *Diseases of the Brain*, gives but a single instance as having come under his own personal observation. In early life their occurrence is more frequent: and Dr. Hennis Green, in an admirable paper on the subject in vol. xxv of the *Medico-Chirurgical Transactions*, remarks: "I have observed 1 case to every 51 in 1324 cases of acute disease in children. When we bear in remembrance that the disease generally proves fatal in early life, by exciting

sub-acute inflammation of the brain, ending in serous effusion, and how prone young children are during dentition to have such attacks of sub-acute inflammation set up, we may cease to wonder at the rarity of the occurrence of cerebral tubercle in adult life. The *locale* of the tubercular deposit, both physiologically and psychologically, invests such cases with varying degrees of significance and interest." Of this the present case presents an apt illustration, and especially if contrasted with another, which I brought under the notice of the Royal Medical and Chirurgical Society some years ago, and which is published in vol. xxv of the Society's *Transactions*.*

Where the opportunity has been afforded of carefully watching a patient during life, and of noting minutely all the changes in the symptoms, the case becomes invested with an interest, which nothing short of a knowledge of the pathological conditions can fully satisfy; but how often in private practice we have to forego this satisfaction, the experience of every one can abundantly testify. It was only a few months ago, that I attended a young lady, of delicate constitution, who had suffered from repeated rheumatic attacks, and who had in consequence disease of the mitral valve from endo-carditis. Under a severe attack of bronchitis, caught through an accidental exposure, she became suddenly hemiplegic and speechless; she soon recovered consciousness and sensibility, so that she perfectly understood whatever was said to her, and noticed all that was doing about her; but she was left hemiplegic, and without the power of utterance. A few days afterwards, and at the time quite unexpectedly and suddenly, she expired. No examination was permitted. But how interesting and instructive it would have been to have seen the actual condition of the cerebral arteries,—the *locale* of the rupture, and the extent of the extravasation,—the state of the anterior lobes of the cerebrum, and of the corpora striata! How interesting in reference to the observations and researches of Dr. Kirkes, and in relation to the site of the organ of speech!

In private practice, we have neither the appliances nor opportunities for pathological investigation, which the physicians and surgeons of our public institutions can command and do enjoy; but still it is gratifying, and it ought

* Case of Local Tubercular Deposit upon the Superficies of the Brain. By Robert Dunn. Read June 14th, 1842. *Medico-Chir. Trans.*, vol. xxv.

to be encouraging, to reflect, what may be done, and what an Abercrombie actually did accomplish, single handed, in the walks of private practice. The pages of our weekly JOURNAL are open to all of us; and where there are so many labourers in the field much may be effected. Though individually the hope may be a slender one of adding any new facts to the records of experience, or for the elucidation of obscure disease: still, with such an example as that of Abercrombie before us, we should feel stimulated to exertion, and allow no opportunity to escape us of bringing the facts observed by others to the test of our own personal observation, and of collecting evidence on points which are still shrouded in obscurity, or about which there exists a diversity of opinion amongst us.

CASE. *History.* The subject of the present communication was born on March 18, 1852, and died when she was two years and two months old, on the 21st of May last. From the hour of her birth she was from time to time under my observation. When only five weeks old she had an attack of convulsions, and lay for three days in a state of stupor. After this she got on remarkably well until the period of dentition. At nine months she could walk alone, and was altogether a forward, intelligent child, of keen sensibility, and with quick perceptive faculties. But she manifested one peculiarity of disposition with which her parents, who are sensible and intelligent people, were much struck, and that was her extreme excitability. They have other children, and the contrast in this respect between them and her became a matter of daily observation. Passing incidents and events, scarcely noticed by them, would throw her into the excesses of joyous emotion, or bring tears of distress into her eyes, so great was her susceptibility to emotion and excitement. She suffered much during the teething period. The teeth were cut irregularly, and more than once she was quite taken off her feet, and manifested great weakness about the loins. At the time of her death she had not got the usual complement of teeth for her age: she was fourteen months old before she had a tooth, when, after the free use of the gum lanect, the two upper, as well as the lower incisors came through at the same time. After this, and in consequence of the weak and delicate state of her general health, she was removed into the country, where she remained until the close of the year. In the interval, though she experienced two or three drawbacks from denti-

tion, her health improved, and she returned to town well and vigorous. I was surprised to see how much she had improved.

In February last, while cutting the *eye teeth*, to use her mother's words, there was first noticed an imperfect paralysis of the right arm, and about a month afterwards the right leg was observed to be in a similar condition. There was no loss of sensibility in either, but at first rather an increase of feeling, for she could not bear them to be sharply rubbed. Her mother thus described to me the nature of the first attack. She observed a kind of tremulous agitation of the arm and hand, not amounting to convulsive twitchings, but to such a degree that she could not, for the moment, hold anything steadily in her hand. This, however, was not persistent: at first it was only now and then, and at other times the hand was steady. Upon close inquiry since her death, I found her mother had more than once observed a kind of convulsive jerking of the leg also, but in so slight a degree that she had not mentioned the circumstance to me. Now this convulsive jerking is worthy of note; and, so far as my own observations have extended, it is an important symptom in the diagnosis of cerebral tubercle.

In a former instance, to which I have alluded, where the tubercular deposit was on the superficies of the brain, it was the most characteristic feature of the case.*

* The subject was a little boy, two years old—a fine intelligent child. He had awoke as usual, between six and seven o'clock in the morning, and his mother was alarmed by observing his left hand begin suddenly to twitch and jerk convulsively. After about twenty minutes this subsided, and for the remainder of the day the child was well and in good spirits. The following morning the jerking returned, and extended to the elbow, but subsided in half an hour. On the third day, from the first occurrence of the convulsive action, I noticed an imperfect paralysis of the hand and arm. On the fourth day, the convulsive jerkings were not confined to the arm, but involved the whole of the left side and lower extremity, with twitchings of the eye and angle of the mouth. These fits increased in violence. Towards their termination (and they lasted about two hours), the child cried and screamed violently; but throughout their continuance, he was sensible, and could at times be soothed by kind attentions from his parents. The fits were followed by profound sleep for several hours, and the side was left partially paralysed. The paralysis was not persistent. A few days previous to his death, the right side was affected also. In this case, I had the advantage of consultation with my friend Dr. Todd, who concurred in the opinion which I had formed, that the child was suffering from superficial inflammation of the brain; and further offered it as his conviction, that the exciting cause was the presence of tubercle—an opinion which the *post mortem* examination fully verified; for we found at the autopsy, that a considerable deposit of tubercle had taken place in the pia mater of the convolutions of the right hemisphere, and that around it there was an extensive inflammatory softening of the cerebral substance.

When I saw my little patient in March, there was an imperfect paralysis on the right side both of the arm and leg, but still they responded to the mandates of the will. She could move her arm about, and could grasp anything firmly enough in her right hand, when her eyes and attention were directed to it; but if they were diverted to something else, and the volitional power withdrawn, she would let the object which she had been holding fall from her hands, and without being conscious of the fact. She did not appear to suffer from any acute pain in the head, but frequently complained of a dull pain, and sense of uneasiness behind the left ear, and often placed her hand there. The hemiplegic weakness gradually increased, but especially in the leg, and to such an extent that she could not walk alone; but if supported at the waist, the leg was still in a degree obedient to the volitional power, though at last its failure gave quite a tottering character to her gait, even when thus supported.

From the time of the first indications of the paralysis in the arm, she had very restless nights, frequently awaking or starting up in her sleep. Her mother never got a quiet night; she always awoke in trouble and distress; she was not an obstinate or self-willed child, but affectionate in the extreme, and readily soothed by her parents. When any disagreement had arisen between them, or with any other member of the family, she was in great distress of mind until a reconciliation of the most affectionate kind was effected. As her weakness increased, she underwent a change of disposition, and became greatly depressed. She was, at times, subject to great uncomfartableness and depression of mind; but her emotional excitability was gone,—she was, on the contrary, lethargic; and when excited to laughter, there was a peculiarity about the expression, a something in the laugh, which at once arrested the attention of her parents, and all who saw and heard her. She could not laugh out like the other children; and her mother described it, as if it were something of the character of an hysterical or rather idiotic laugh.

On the 18th of May I was hastily called upon to see her. She had been suddenly seized with sickness of stomach, and I found her in a state of great prostration, and labouring under symptoms which unequivocally pointed to the brain as their seat. The sickness subsided; but stupor supervened, and early in the morning of the 21st she was seized with convulsions, which continued with slight in-

termissions for ten hours, when she expired. The convulsive motions were at first confined to the right side, but before she died the whole body was involved in the convulsive agitation.

Autopsy. A *post mortem* examination was readily permitted. I expected to find serous effusion, and some chronic organic disease in the cerebellum or left corpus striatum, or in both. On removing the calvarium, the vessels on the superficies of the brain were found to be filled with dark blood, and there was considerable serous effusion in the ventricles, and at the base of the skull. On slicing down the hemispheres and exposing the lateral ventricles, my attention was instantly arrested by the large size of the thalamus opticus on the left side: it was more than twice its normal size, and the contrast was most striking between it and the adjacent corpus striatum, and with its fellow on the opposite side; but this contrast was only in respect of magnitude, for the colour and external aspect were natural. It evidently encroached upon the corpus striatum and crus cerebri by its magnitude. A vertical section through its substance showed that its size was owing to the presence of a tumour in its interior, of a yellowish grey colour, and of a cheesy consistency, and a portion of which, when submitted to microscopic examination by my friend Dr. Lionel S. Beale, professor of physiology at King's College, was found "to consist almost entirely", to use his own words, "of cells, resembling those met with in tubercular deposits in the lungs, with a small quantity of fibrous connective tissue". He kindly favoured me with a drawing, representing the appearance of these cells under a quarter-inch achromatic, and also when treated with acetic acid. On making an incision through the lateral lobe of the cerebellum on the left side, with a view to expose the arbor vitæ, I found I had cut through a similar tubercular deposit, a little to the outer side of the median line, but which differed from that in the thalamus, in being in a state of softened degeneration. The viscera of the other cavities of the body were not examined, though if they had been, there is little reason to doubt but that tubercular deposits would have been met with. Behind the left ear an enlarged gland, about the size of a large pea, had long existed, and its contents were of a cheesy consistence.

REMARKS. The case presents points of interest, both in

their physiological and psychological bearing, in reference to the functions of the cerebellum, corpus striatum, and thalamus opticus, the nervous centres involved in the disease.

I would first advert to the cerebellum. The tubercular deposit, in its left lateral lobe, and the state of softened degeneration in which it was found, will satisfactorily account for the paralysis of the right leg and the tottering gait which the child had latterly exhibited in her attempts to walk; but then it may reasonably be asked, Will this degeneration of the cerebellum explain the condition of the upper extremity, and the absence of the muscular sense in the hand, which was noticed when the attention of the child was withdrawn from the object which she held in her grasp? I could adduce other instances, were it necessary, which have come under my observation in support of the position that the lateral lobes of the cerebellum are subservient to the maintenance of the equilibrium of the body, to combined muscular action, and to the co-ordination of the voluntary movements; but I need only refer to my "Case of Apoplexy of the Cerebellum" in vol. xxxii of the *Medico-Chir. Transactions*. As to the state of abeyance of the muscular sense in the hand, if the corpus dentatum, as Dr. Carpenter has suggested, be the seat of that sense, then the degeneration in the lateral hemisphere of the cerebellum may be fairly adduced in explanation as its cause; but, as there was no marked loss of cutaneous sensibility in the arm or leg, this state of degeneration is opposed to the hypothesis of my friend Dr. Noble, that the lateral lobes of the cerebellum are the seat of common sensation. As to the hemiplegic condition, we know that deep seated disease of the cerebellum or its crura will produce hemiplegia, and be attended with the same symptoms and phenomena as lesion of one side of the pons Varolii, and in consequence, it is argued, of the continuous connexion which exists between the lateral lobes of the cerebellum and the fibres of the pyramids in the pons Varolii. But still, in the present instance, I am inclined to the opinion that the paralyzing influence upon the upper extremity was more probably due to the pressure of the enlarged thalamus upon the corpus striatum and crus cerebri than to the tubercular deposit in the cerebellum, though, after the remark of Dr. Todd, that "the pressure from a clot in one hemisphere of the brain, by encroaching more or less upon the corpus striatum, will produce symptoms exactly the same as those of a similar clot deep in the

substance of the corresponding cerebellar hemisphere",* it may be difficult to decide to which the paralysing influence was really due—the tubercular deposit in the cerebellum, or the pressure occasioned by the size of the thalamus. I am inclined to ascribe it to the latter; for it must be remembered that the arm and hand were affected for at least a month before the leg gave any indication of being in a similar condition. The paralysis was imperfect; its invasion was insidious and gradual, and just of such a character as might be expected to result from the increasing pressure of the enlarging thalamus upon the corpus striatum and crus cerebri *as motor centres*. It is notorious that lesions of the thalami optici, as well as of the corpora striata, will produce hemiplegia: and this leads me, in the second place, to advert to the functions of these encephalic ganglia, and to the intimate relationship subsisting between them. As Dr. Todd has justly observed, "It is remarkable that lesions of the optic thalamus should produce nearly or precisely the same effects as lesion of the corpus striatum. This is probably explained by the intimate union of the two bodies, so that neither can be affected without the other participating in the morbid influence; but if the thalamus opticus be the part diseased, the corpus striatum will suffer more in consequence than the optic thalamus would if the corpus striatum were the seat of the lesion, because of the great size and extensive connexions of the optic thalamus, and the smaller size and more limited connexions of the corpus striatum."†

Now, I hold it to be indisputably established, and my own pathological researches have confirmed me in the opinion, that the *corpora striata are the motor ganglia of the encephalon*. Implanted upon the motor tracts of the crura cerebri and medulla oblongata, *in them the motor fibres terminate*; and they thus, with the vesicular matter of the locus niger, and the anterior segmental ganglia of the spinal cord, constitute the motor axis of the nervous system, and the source of all the movements of the body, whether reflex, emotional, or voluntary. The corpora striata are not *the seat of volition itself*, for that is an attribute of the intellect, but the encephalic motor centres, through which the mandates of the will and volitional power of the hemispheres are propagated—*the connecting links of thought*

* Dr. Todd's Clinical Lectures on Paralysis of the Brain, etc., p. 91.

† Ibid. p. 24.

with action. Their commissural connexions with the cerebrum are so intimate and so extensive that they are evidently placed in subserviency at every point, through the agency of innumerable radiating commissural fibres, to the volitional power of the hemispheres, in every voluntary act and effort. And thus we find, in hemiplegic patients, that the imperfect power of utterance which we so constantly meet with is due to some structural lesion in these commissural fibres, or in the motor centres—the corpora striata—through which the volitional impulses operate in speech. In the present instance, the corpus striatum was not diseased; but both it and the crus cerebri were subjected to an undue pressure, from the magnitude of the enlarged thalamus, and to such a degree, in my opinion, as not only to induce a paralysing influence upon the upper extremity, but to occasion the striking peculiarity of the child's laugh.

Laughter, as a simply consensuous act, we see daily illustrated in the smile that mantles on the infant's countenance from the effects of flatus, or some internal excitation; and in the boisterous burst, with its uncontrollable motorial accompaniment, which follows titillation of the surface: but in these, and for the free and full outward expression of the joyous emotional act—"laughter holding both her sides"—the perfect integrity of the motor centres and their channels is required.

This child had a constrained laugh—not the hearty laugh of other children. Still the channels were free for the transmission of the volitional power; for, by an effort of the will, the child could firmly grasp an object in her hand; but on withdrawing her attention from the object, she would then unconsciously, as the muscular sense was in abeyance, let it fall.

But the corpora striata are not solely the motor centres of volition. From their close commissural relations with the thalami optici, they are also and equally the centres and channels of respondent sensori-motor actions, and of consensual, instinctive, and emotional movements. Dr. Todd and Mr. Bowman have shown that there exists between the corpora striata and thalami optici a relation analogous to, and as close as that which subsists between, the anterior and posterior peakes of grey matter in the cord; and, as in the case of the spinal cord, the anterior peakes or segmental ganglia issue motor impulses in response to sensations excited through the posterior peakes, so, in

the case of the encephalon, the corpora striata propagate motor impulses in response to excited internal feelings and emotions, of which the thalami are the seat, and often quite independently of thought or volition.

The condition of the left thalamus opticus adds to the interest of the case. It was more than twice the size of its fellow, in consequence of the deposit of tubercular matter into its interior. Now what are the offices of the thalami optici? They are the essential ganglia of the sensory tracts, as the corpora striata are of the motor: and, as the peripheral extremities of all the afferent spinal nerves, diffused and ramifying upon the entire superficies of the body, administer to the sense of *touch*; and, as these impressions are transmitted from the posterior segmental ganglia of the cord, *upwards* along the sensory tracts, the inference is certainly legitimate, if not inevitable, that *the thalami are the encephalic centres of tactile and common sensation*. My friend Dr. Noble has suggested a different allocation in the lateral lobes of the cerebellum; but the present case does not support his view, and the instance of the little lancelet (the *amphioxus*) is fatal to this hypothesis; for we cannot deny to the little creature the possession of tactile and common sensation, and yet, in its case, we know that *the cerebellum is wanting*.

The thalami optici, however, are not the mere centres of tactile sensation. They are the common foci of the sensory nerves. Implanted upon the sensory tracts of the crura cerebri and medulla oblongata, *in them the sensory fibres terminate*; and they are in direct fibrous commissural connexion with the respiratory, gustatory, and auditory ganglia, and with the optic nerves, by a direct passage of a portion of their roots, and with the peduncles of the *olfactory nerves*, through the medium of the fornix: and thus we see that a connecting nervous thread ramifies throughout the entire circle of special sensation, and that the thalami optici form a common centre or point of union for the sensory nerves.

I cordially agree with Dr. Noble that the thalami optici have a higher, a more exalted and extended sphere of action, than that of being the mere centres of tactile sensation. We have seen that they are a common foci and point of union to the nerves of special sense; and, as the corpora quadrigemina are manifestly not simply the ganglia of vision, but are evidently the seat of those objective emotional feelings and motor impulses which are roused into

activity through the instrumentality of sight, so do I believe, with Dr. Carpenter, that the thalami optici are the seat of our inner sensibility, and of feelings and motor impulses associated with the emotional states. Lying within the bend of the corpora striata, the thalami, like these bodies, are in most intimate relation with the cerebrum, through the instrumentality of innumerable fan-like commissural fibres—Reil's nerves of the internal senses—the *connecting links of thought with feeling*. Along these channels from the thalami, according to Dr. Carpenter's able exposition, sensory impressions are transmitted upwards to the cerebrum, to be idealised and registered; and from thence thoughts and idio-emotional workings pass downwards to them, there to receive their varying shades and hues of feeling; for *thought* bears to *feeling*—the cerebrum to the thalami—the same relation which the physical impressions upon the organs of the external senses bear to the special endowments of their sensory ganglia in the encephalon: for instance, as in the sense of vision, the retina of the eye to the corpora quadrigemina. The nervous force is a polar force; and the sensory ganglia, placed midway between the poles, may be played upon from either end; from below or from above; upwards, from the *outer world*, by the appropriate physical stimulus upon the nervous vesicular expansion of each of the external organs of the senses; downwards, from the *inner or psychological world*, by the flow of our thoughts, and the workings of the idio-dynamical, emotional, and moral agencies in the cerebral organs. And thus it is that we see idealised impressions reflected downwards from the cerebrum upon the sensory apparatus or ganglia, produce precisely the same effects at the extremities, as that which is occasioned by physical impulses there; the mere idea, the recollection of the idealised impression of a pleasant taste, making the mouth to water; and the idea of something disgusting producing sickness and exciting vomiting.

But, to return to our case. What were the psychological phenomena observed in the child? Certainly among the first was her extreme susceptibility to emotional excitement; and I think it may be fairly inferred that the primary disposition of the tubercular matter would exert an exciting if not an irritating influence upon the vesicular substance of the thalamus, and its functional manifestations. Eventually, no doubt, the effect would be different; and ultimately its accumulation and subsequent degeneration

would necessarily lead to the total abolition of these functions. As it was, a great change had been noticed in the disposition of the child; the contrast was striking between her early susceptibility to emotional excitement and the lethargy and diminished sensibility which characterised the latter weeks of her life. I regret that I did not test the comparative sensibility of the arms and legs; and I must candidly confess I had not observed any marked loss of sensibility on the hemiplegic side. It must be remembered, however, that the tubercular deposit in the thalamus had not become softened: it was firm and consistent, occupying solely the central part of the organ, and not extending downwards into the vesicular matter of the olivary columns; so that the lower portion of this extended centre of sensation was not affected by it, and hence its presence may not have essentially interfered with the function of tactile or common sensation. But, be this as it may, the mass of softened degeneration which was found in the left hemisphere of the cerebellum had destroyed the integrity of its structure; and the persistence intact *after this* of cutaneous sensibility is fatal, in my opinion, to the notion that the lateral lobes of the cerebellum are the seat of common sensation, whilst it goes far in support of the position that these lateral lobes, or, according to Dr. Carpenter, the corpora dentata, are the seat of the muscular sense.

I cannot close this case without reiterating the conviction which I have elsewhere expressed, that medical psychology has been too much neglected. At the present time, however, its importance is more justly appreciated; and of this the valuable *Lectures* of Dr. Noble on the *Correlations of Physiology and Psychology*, recently published in the ASSOCIATION JOURNAL, are an earnest. The establishment of the *Psychological Journal* by Dr. F. Winslow has given a fresh impetus to such inquiries. "The psychological phenomena or symptoms of disease present a wide and an interesting field for observation and inquiry; and it is, I think, much to be regretted that the subject has not more fully engaged the attention of those distinguished men to whom we are so much indebted for their valuable researches into the pathology of the brain. As the seat of conscious existence, and of feeling and emotion—of all our hopes and fears, our joys and sorrows, and of the higher attributes of the intellect and reason, the MIND, it is admitted, ought to be studied, in connexion with the *material conditions* of the encephalon, since it is through the instrumentality of the encephalon as

its organ that its own operations and processes are manifested throughout the totality of life in health and disease. And hence the importance of medical psychology, of tracing the relations and reciprocal actions of mental and bodily phenomena, and the necessity of noting and studying the psychological manifestations or symptoms as they become developed, and especially in diseases of the brain and nervous system.”*

In the former case of cerebral tubercle, to which I have already alluded, where the deposit was upon the superficies of the hemispherical ganglia, the psychological phenomena were very significant, and the only indication of the local seat of the disease. For some time previous to his last illness, the parents had been forcibly struck with a change in the disposition of the child, which they had observed for some time to have been gradually taking place. From being a happy, placid, and docile boy, he had become more and more petulant, self-willed, and obstinate; very determined to have whatever he set his mind upon, and not to be driven from his purpose; in a word, to use their own language, he had become a most obstinate and self-willed boy.

So marked, indeed, was the change of disposition, that it had become a subject of serious consideration with them, whether it was to be attributed to some latent disease under which he might be labouring, or to mere infirmity of temper. But as he continued to eat, drink, and sleep well, and did not appear to be suffering from any bodily complaint, they contented themselves with endeavouring to correct, by moral discipline and management, what they were inclined to consider rather an infirmity of the mind than of the body.

Now, it is a fact worthy of observation, that on the *post mortem* examination of the brain, the tubercular deposit was found to be situated on that part of each of the hemispheres of the brain where Gall and Spurzheim have located the organ of firmness; and, if we associate the change of disposition which had taken place with the structural disturbance induced by the tubercular deposit (and certainly among the first of the morbid effects arising from the deposit, would be an irritating excitement on the grey substance which would lead to an abnormal development of its functional power), the case may be fairly adduced in support

* Case of Hemiplegia, with Cerebral Softening, and in which loss of speech was a prominent symptom. Read before the Royal Med. Chir. Society, Jan. 25th, 1850: and published in the *Lancet*, Oct. 20th, Nov. 2nd, 1850.

of the hypothesis of Gall and Spurzheim, and of the locality which they have assigned as the site of the organ of firmness, for obstinacy is its abuse.

The attempt to trace the connexion between structural diseases of particular portions and organs of the encephalon, and of deranged, impaired, or obliterated manifestations of the mind, is clearly one which comes legitimately within the province of the medical observer; and, however great the difficulties by which the endeavour may be surrounded, it is nevertheless one of great interest and vast importance. In private practice, the opportunities for such inquiries are necessarily limited, and no one can be more sensible than I am, how prone we are, where the experience is contracted, to attach undue importance to individual cases.

But, at the same time, if individual cases were faithfully recorded, after having been carefully watched, and the *post mortem* appearances noticed, a mass of valuable evidence would soon be accumulated, and a more correct knowledge of the functions and special endowments of the nervous centres of the encephalon obtained. It is, if I am not greatly mistaken, to *post mortem* examinations of the brain, and to pathological investigations, more than to any other source, that we are to look, not for the discovery of normal functions, but for evidence in support or refutation of opinions and doctrines already advanced.

The illustrious Gall may be considered as the founder of physiological psychology. One of the most remarkable men of the age in which he lived, he was alike distinguished for originality and independence of thought, for his powers of observation, untiring industry, and indomitable perseverance. To him and his able coadjutor, Dr. Spurzheim, medical science, as well as physiology and psychology, is under great obligations. Since their time, indeed, and both in this country and abroad, great advances have been made towards a more exact knowledge of the functions and special endowments of the nervous centres, so that the progress of physiological discovery may lead us to reject or modify many of their generalisations and views. But all honour is due to Gall, for he was the first to enunciate clearly the true relations between the psychological nature of man and that of the lower animals; and it is no detraction from his merit, to reconsider the system of organology which he propounded, by the light which subsequent physiological inquiry and discovery have thrown upon the subject.

At present there are many labourers in the field, and much has been accomplished. A second Newton may arise among them to thread the labyrinth of metaphysical subtlety, with the logical acumen of a Locke, to collect and bind together the scattered and isolated links of the great chain of physiological discovery; to point out the bearing of the pathological facts of past experience; to interrogate nature herself on the functional characters *written upon the nervous pulp* of the several ganglia, and to read her own replies in the living experiments which she has presented to us in the lower forms of animal existence; and thus to place the great doctrines of mind on the solid basis of a sound *physiological psychology!*

Among living physiologists, my friend Dr. Carpenter has done more than any other man to specialise the functions of the nervous centre of the encephalon; and through comparative anatomy, by analytical reasoning and strict induction, to advance our knowledge of the physiological psychology of man. To my mind he has fully established the following important positions:—

I. The independent character of the sensory ganglia, as instruments of sensation, and of respondent consensual and instinctive actions.

II. The superadded character of the cerebrum, or great hemispherical ganglia, as the phrenic ganglia of the brain, the seat of our intellectual operations and reasoning processes, where ideas are formed, and where the will exerts its power.

III. The composite or mixed nature of the propensities, emotions, and moral feelings, as compounded of ideas, and of the sensorial feelings of pleasure and pain—the former, their intellectual element, having their seat in the hemispherical ganglia, and the latter, or sensational, in the sensorium commune or sensory ganglia.

Now, the establishment of these positions, the independent character of the sensory ganglia, and the restriction of the functions of the cerebrum to intellectual operations, this separation and localisation of the centres of sensation and of intellectual action, of feelings and of thought, and the development of the composite nature of the active powers of the mind, the emotions, propensities, and passions, constitute a real advance in psychological science.

That sagacious philosopher and profound logician, Mr. John Mill, it is worthy of remark, from the contemplation of the constitution of the human mind, apart from all

physiological considerations has, it would appear, been led to the adoption of views in accordance with these positions. The coincidence is not without significance and interest; but it has long been the settled conviction of my own mind, that the metaphysician can make little progress independently of the physiologist, and that it is to the medical philosopher and physiologist that we are to look for the most valuable contributions to the science of mind. To be reminded of what they have done, we have only to recall the names of Locke, Hartley, Brown, etc.

The expressive language of Dugald Stewart, in reference to Locke, in his admirable dissertation on the progress of philosophy, admits of general application.

“No science,” says he, “could have been chosen more happily calculated than *medicine* to prepare such a mind as that of Locke for the prosecution of those speculations which have immortalised his name; the complicated and fugitive, and often equivocal phenomena of disease, requiring in the observer a far greater portion of discriminating sagacity than those of physic strictly so called.”

The praise which our English Hippocrates, Sydenham, the greatest authority of his time, bestows on the medical skill of Locke, affords a brilliant proof of the high estimation which his acquirements in the science of medicine, his penetrating judgment, as well as his many private virtues, had procured for him from all who knew him. In the dedication prefixed to Sydenham's *Observations on the History and Cure of Acute Diseases*, published in 1676, he boasts of the approbation bestowed upon his method by Mr. John Locke, who, to borrow Sydenham's own words, “had examined it to the bottom; and who, if we consider his genius and penetrating and exact judgment, has scarce any superior, and few equals now living.”

“Nostri præterea quam huic meæ methodo suffragantem habeam, qui eam intimeus per omnia perspexerat utriusque nostrum conjunctissimum dominum Joannem Locke; quo quidem viro, sive ingenio judicioque acri et subacto, sive etiam antiquis, hoc est, optimis moribus, vix superiorem quenquam, inter eos qui nunc sunt homines repertam iri confido, paucissimus certe pares.”—*Vide Lord King's Life of Locke.*

Dr. Noble's *Elements of Psychological Medicine* are a valuable contribution to mental pathology. I have read them with interest and pleasure, and I hope with advantage. He has proved himself true to his convictions; and we must

all admire his renunciation of phrenological dogmata, when convinced that they were untenable, though once held to be true, and then so ably advocated by him in his work on the *Brain and its Physiology*.

In conclusion, however, I must give expression to my conviction, that Mr. Morrell's *Elements of Psychology*, so far as the work is published, is one of the most valuable contributions to the science of mind that we have in our language. The author of *The Historical and Critical View of the Speculative Philosophy of Europe in the Nineteenth Century* is well read in the physiology of the nervous system. He has availed himself of the disquisitions of his friend, Dr. Carpenter, and taken a most important step in the right direction. I feel that I am not alone in looking forward with interest, and some degree of impatience, for the completion of his work. I cannot too strongly recommend both it and Dr. Carpenter's chapters on the Nervous System, in the last edition of his great work on *Human Physiology*, to the study of my professional brethren.

31, Norfolk Street, July 27th, 1854.

