

Our distinguished *confrère* argues ably in favour of his proposition, but we confess we think M. Blanche has the best of the argument. One very important point against divorce is that, however satisfactorily the financial matter may be settled, the patient would no longer leave husband or wife as the case might be, to look after his or her proper care and comfort. This is or ought to be the life-long duty of the consort who remains sane; a painful and self-denying one, no doubt, but still a solicitude "digne de tous les éloges."

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## 2. *German Retrospect.*

By W. W. IRELAND, M.D.

(*Analysis of Goltz's Work,\* continued from p. 290.*)

When the spinal cord of a dog is cut through, the hind legs, bladder, rectum, and erectile power seems to be quite paralysed, and on tickling the skin of the paralyzed posterior extremity of the dog's body, no reaction follows. This led to the conclusion that the centres for the motions of the bladder, rectum, &c., were situated in the brain. In reality these centres had their seat in the dorsal portion of the spinal cord. Owing to the section of that organ the functions of the parts below were suspended; but after some weeks the inhibited functions again returned. One must, therefore, be very careful in distinguishing the phenomena of inhibition from the residual effects of a vivisection. If one, he observes, pinches the left hind foot of a dog which has just suffered the loss of a portion of the right hemisphere, the animal shows no sign of pain; but neither does he show any trace of other reflex action. If one makes the same experiment with an animal whose spinal cord has been cut through several months before, he draws back the pinched paw very promptly. The centre for this reflex action lies in the dorsal part of the cord. But why does this reflex fail with the dog which has the spinal cord uninjured, but a fresh wound in the brain? Clearly because the reflex centre on the right side of the cord has suffered inhibition from the fresh wound given to the left hemisphere of the brain.

Goltz believes that any part of the nervous system may suffer inhibition after a lesion of the cerebrum. He does not make it so clear what are the parts which actually do suffer in the cases in point. He, however, mentions that in the first place after a wound, the remainder of the brain is in danger of being inhibited more or less. The cerebellum and cerebral ganglia are also in danger of having their activity suspended. It is likely that Dr. Goltz's adversaries may

\* "Ueber die Verrichtungen des Grosshirns." Bonn, 1881.

consider that he should be somewhat more explicit on these points. We should especially like to know what so distinguished a neurologist believes to be the function of the cerebellum.

Goltz gives no explanation of the definite muscular movements excited by the application of the electrode to certain zones in the hemispheres which have been used as evidence that the motor tract connected with the spinal cord extends as far as the median convolutions. It is undecided, he says, what portion of the brain is really stimulated. He asks why the grey matter of the frontal lobe is not excitable? Whatever function it has, we might expect to see this function in excited action. He points out the varying extent of the application of electricity in the excitable zone given by Hitzig and Ferrier. Why, he asks, do those who have tried extirpation of the so-called motor centres always choose the centre for the fore-paw? Why do they not give us a row of dogs in which one cannot move the tail, another the under jaw, a third the tongue, and a fourth the ears? Albertoni and Michieli have extirpated the centre for the movements of the under jaw and tongue without any result. Even after these so-called centres were destroyed on both sides, the dog was still able to bite, eat, and lick. Lussana and Lemoigne found no results after extirpation of certain motor centres. Richet, Luciani, and Tamburini have made similar observations.

Dupuy states that he has removed the grey matter of a whole hemisphere in a dog without any loss of muscular power. Dr. Svetlin, experimenting in Goltz's laboratory, found a loss of motor power in the fore and hind legs some hours after operation; but this disappeared in a few days after. The professor himself has found that he could not produce paralysis of one limb without the other limb on the same side being similarly affected. He has noticed that mechanical irritation of the parietal lobe is sometimes followed by convulsions on the opposite side of the body, and has ascertained that these convulsions do not take place unless the irritation is applied at least four millimetres deep. This confirms him in the idea that it is not the grey matter, but the underlying white substance, which is acted upon by the excitation of the electric current in Hitzig's experiments. Goltz makes himself merry at the manner in which physiologists have assumed that the extirpated centres may be shifted to some uninjured part. Chased by inexorable experiments from the whole surface of the hemisphere, the motor centres have had to take refuge in the corpora striata; and the visual centres have had to resort to their old haunts, the optic thalami and corpora quadrigemina. After removal of one hemisphere no marked injury to the intelligence is noticeable.

Having studied the effects of lesions on one side of the brain, Dr. Goltz takes up the consideration of vivisections of both hemispheres. In his experiments on this subject fifty-one dogs were sacrificed. The general result is that while a dog injured on one

side of the brain only shows symptoms on the opposite side of the body, the dog injured on both hemispheres shows the same symptoms on both sides, and if the portion of brain abstracted be considerable, the animal becomes idiotic or demented. No effect can be noticed after abstraction of a small portion of grey matter, but if the amount be considerable, as a general rule the loss of intelligence is in proportion to the mass of brain removed. The injury to vision slowly passing away, the loss of sensibility, and of muscular power slowly, but never quite disappearing, are now found on both sides. The dog is only capable of simple motions, such as walking or leaping. He is awkward in his motions, and no longer uses the fore paws to pull or catch, though in some cases, at least, this incapacity seems to have passed almost totally away.

The beast is stupid and dirty, and seems to have suffered a loss in the sense of taste, since it eats dog's flesh, which formerly it rejected with disgust. The sexual appetite is much diminished, and when the loss of brain substance is great it is totally wanting. The following is a graphic description of the mental condition of a dog which has remained alive after removal of portions of the cerebrum on both sides. He has a demented or half-witted appearance, as is at once suggested by the expression in the eyes. His motions are generally sluggish. He appears slower at determining to do anything. He stalks about like a machine in a comical way. If another dog stood in the way he would push under its belly, even if he has to bear the weight of the other animal, or he will rather stumble over a dog lying in the way than walk round it. Dogs which have lost a large portion of the brain scarcely ever run, but can make powerful bounds. Those which have lost a smaller portion of the brain are more lively, but very helpless when called upon to do any unaccustomed motion. Those which have lost much of the brain take a great deal of rest, and are roused with difficulty. After meals, though they are generally apathetic, they are, when persistently excited, subject to violent fits of rage, which soon subside. Animals so operated on were found to have lost the memory of things they had once learned, though they retained the capacity in diminished power of learning the same things over again.

Hitzig found that when a dog which has suffered from extirpation of the motor centres of the left hemisphere walks along the table, he is apt unheedingly to put the right foot over the ledge, and thus fall over. Goltz has made the same observation, though he considers it indifferent whether the grey matter removed be from the median gyri or from other parts of the hemispheres. The fact is capable of several explanations. Goltz experimented on the question by cutting a hole in the table, and thus making an artificial trap door which could be suddenly opened under the animal's foot. He found that where a portion of brain had been removed on the opposite side, the dog was much less ready to recover its balance and draw out the limb.

He thinks that this is owing to the diminished sensibility of the affected member. The animals suffering from lesions in the brain had a less correct idea of the situation of their bodies in space, or their relation to other objects. This is probably owing both to the diminished power of the senses and to the lessened power of the brain in drawing correct inferences from the sensory impressions transmitted to it.

In dogs injured in both sides of the brain, hearing was also impaired, though not extinguished. They could still exercise the sense of taste, and smell, but ate substances such as dog's flesh, which they would previously have rejected, and endured the smell of chloroform, and other drugs which are very disagreeable to dogs in their normal condition.

Goltz especially notes that dogs in such a situation have not one muscle of their body paralysed. The strength of the muscles is normal; they can stand, walk, run, and spring. Goltz is very emphatic and explicit in his assertions that his vivisections implicated on one occasion or other all these portions of the grey matter lying under the superficial vault of the cranium. Sometimes he found that the lesion, or disease resulting therefrom, had more or less implicated the corpora striata and optic thalami; but the corpora quadrigemina, the crura cerebri, the pons, and the cerebellum were unaffected. Thus, though Goltz does not entirely hold with Flourens that after removal of considerable portions of the hemispheres, the remaining portions could assume the whole functions of the uninjured organ, he totally rejects the allocation into sensory and motor zones of the cerebrum. Neither does he hold with the renowned French physiologist that in vivisection of the brain all the senses gradually disappear, as slice after slice is cut away, since he has found that the power of vision is more easily injured than that of hearing. Goltz found that the results following removal of the parietal lobes passed away more easily than those following removal of the gyri behind them, and that animals which have suffered the loss of the grey matter of the parietal lobes have a duller sensibility than those which have suffered a similar loss in the occipital lobes. After injury to the occipital lobes the loss of vision is more enduring. A dog which has lost the posterior portions of the cerebrum is more stupid than a dog which has lost a similar quantity on the frontal side. In another passage he writes: We must make the general acknowledgment that the anterior parts (*vordere Quadranten*) of the cortex cerebri have a more intimate connection with the movements of the body and with cutaneous sensibility than the posterior parts (*hintere Quadranten*). Nevertheless, he is disposed to think that this is owing to the conducting tracts in the centrum ovale being more liable to suffer injury after lesions of the anterior parts of the hemispheres. In studying the mental manifestations of dogs injured on both sides of the brain, there are sources of fallacy which it is not easy to elude.

We should have had more confidence in the author's analysis had the following passage occurred at the beginning of his first treatise, instead of at the end of the last one. "In studying the altered actions of animals whose brain has been injured, it has occurred to me that perhaps the chief failing which makes them incapable of apprehending the impressions of the senses, is want of attention. When we are disturbed, occurrences pass away without any trace on our consciousness, which must excite the senses in a lively manner. Though the organs of sense are busy in conveying impressions, we neither see, smell, hear, nor taste. The dogs artificially demented are perhaps reduced to this state of mental disturbance. They are not in a condition to exercise their attention so as to give a proper interpretation to the impressions of the senses. Dogs after extensive destruction of the cerebrum are not quite blind, they can still avoid obstacles placed in their way, and turn towards the light. T. Stilling has shown that the deep origin of the optic tract in man can be traced to the pons Varolii, the medulla, and the spinal cord. It seems to me possible that the regulation of the movements of the body from the impressions on the retina may pass by this way."

To criticise Goltz's observations one would need to repeat his experiments, and even should their correctness be admitted without any qualification, there might be great dispute about the correct interpretation of the phenomena. It is to be hoped, in the interests of the martyrs of cerebral physiology, that definite results will be attained as quickly, and with as little suffering as possible.

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### 3. *Colonial Retrospect.*

By FREDERICK NEEDHAM, M.D., and D. HACK TUKE, M.D.

*Annual Report of Asylums, New South Wales, by Dr. Manning, Inspector-General of the Insane. Report for 1881.*

This report gives evidence of continued progress in the care and treatment of the insane in the Colony whose department of lunacy is presided over with so much ability by Dr. Manning.

The number of registered insane persons in New South Wales on the 31st December, 1880, was 2,099, and on the 31st December, 1881, 2,218, showing an increase of 119. This increase, however, although larger than that of any previous year, does not appear, according to this report, to be due to any largely increased production of insanity, but to the influence of a very low death-rate.

The proportion of insane persons to population was 1 in every 352, which is almost identical with that in England.

The following tables are interesting for comparison with similar tables in English asylums :—(See next page).