

April 29th 1919

SURGICAL EXPERIMENT

THE Value of the Method

Historical Examples

To the Editor of the Times

Sir, in our previous letter we did not give many examples of the value of the method of experiment in the progress of surgery. The subject traverses so wide a field that we cannot do more than touch the very fringe of it, and this only as an indication of the reason why we are convinced supporters of experiments on living animals. If we were not surgeons we are willing to admit that we might have been anti-vivisectionists – that is if we had refused to accept expert evidence, and if we had failed to make a full examination of the evidence for ourselves. In short, we wish to say that we esteem and honour the sentiment of kindness to animals which lies at the bottom of the opposition of some to research. In saying so much we would also add that if we were not surgeons we feel confident that we should not be numbered among that small class of persons who on this subject display a lamentable want of truth and justice and

*Whose tongue
Outvenoms all of the worms of Nile*

Cerebral Localization and the Surgery of the Brain

At the International Congress in London in 1881 Sir David Ferrier gave the first definite and the most splendid demonstration of the truth of cerebral localisation. Professor Goltz brought a dog to the Congress to prove the contrary, but was utterly defeated. Two monkeys were shown by Ferrier and each had had a portion of the brain cortex removed. As the first monkey was led into the room feeding on nuts, Charcot, the great French neurologist, jumped up and exclaimed “It is a patient.” The monkey was hemiplegic (i.e. was paralysed on one side). The other monkey unconcernedly was placed on a table, and Ferrier without notice fired a pistol. Amongst those in the room the monkey alone was undisturbed by the noise: its auditory centres had been destroyed. (To complete the story, Sir David Ferrier was later prosecuted in the police court for performing experiments without a licence. It turned out that Professor Yeo had performed the operations on the brains of these monkeys, while Sir David acted the part of recorder and observer. Further, that the Government had advised that one licence was sufficient for the purpose and not two! Such was the precarious foothold in this country of even the greatest men who seek to unfold for mankind the wonders of Nature.).

Sir David Ferrier gave the Marshall Hall oration in 1883. The forecast he then made has been fulfilled. He said that up to that time cerebral localization had been absorbed like latent heat by medical science itself as distinct from medical and surgical practice, but that the unfailing safety of experiments on the brains of animals made it clear that similar results would soon be achieved on man himself.

When we were students no operations on the brain were performed except for injuries due to compound fracture, and then very imperfectly. What a change since that time! “By what miracle has the slender seedling full of sap become the vigorous tree beneath the shade of which works our restless activity, ever in search of new triumphs?” All our knowledge of the functions of the brain, all the possibilities of successful operation on brain abscess and brain tumour, have been garnered by stimulation and ablation experiments on the brains of animals. British scientists and surgeons have played a leading role in this memorable work which is of incalculable

value to the human race. The truth, then, is that in our own lifetime the surgery of the nervous system has shared in almost miraculous way in the immense advances which have been made during the last 30 years in all departments of surgical practice, and this advance could not have been made except by the aid of experiments on living animals.

SUTURE OF THE STOMACH AND INTESTINE

In Greek and Roman times wounds of the abdominal wall with protrusion of viscera were well known. Celsus and Galen give elaborate directions for the suture of wounds of the intestine. The sutures used were silk and catgut, and it is obvious that some cases recovered, otherwise the practice would not have been continued. Possibly the use of wine as a dressing was an aid to a successful result, for spirit of wine is known to be an excellent dressing.

In 1826 Lembert performed his classical experiments on intestinal suture. These experiments were done on dogs. He found that the one certain method was to make the intestinal wound front inwards instead of outwards, and to bring the peritoneal membrane in apposition across the gap. By this means he obtained a closure which was watertight and which was quickly sealed and healed.

All experiments on the suture of the intestinal tract since Lembert's day have used dogs, and many and great advances have been made. In every operation on the stomach and intestines (and these are now daily performed throughout the length and breadth of the land), the Lembert suture is employed by every surgeon, and the safety and success of this suture was discovered by Lembert by experimenting on dogs. In Caesarean section the operation, which aims at saving the child without risking the life of the mother, the Lembert suture closes the incision in the womb and makes success possible.

In 1881 Wolfler, the professor of surgery in Vienna, found in a patient a cancer blocking the outlet of the stomach, which he could not take away. His assistant Nicaldoni then recalled Gely's experiments on dogs, whereby an intestinal obstruction could be overcome by making a communication between the gut above the obstruction and the gut below. Wolfler then united the stomach to the intestine, thus short-circuiting the obstruction. This operation is now known as gastro-jejunostomy. It is constantly performed. It is, indeed, one of the most common of major operations. It is calculated to give the greatest relief to uncontrollable vomiting and pain. It is the Lembert suture which makes for success in gastro-jejunostomy and in all cases of intestinal anastomosis.

THE SURGERY OF THE GALL BLADDER

Zambeccarius, an Italian surgeon, in 1680 drained the gall bladder and also excised it in dogs. The dogs recovered. It was previously believed in accordance with the aphorisms of Hippocrates that wounds of abdominal organs were necessarily fatal. These experiments were necessary to break down the prejudice that existed against attempting such operations on men.

It is curious what a long interval elapses between the discovery of new knowledge and its application to practical surgery. Petit, a great French surgeon, in 1770 applied this knowledge to human patients, and operated in gall-stone cases; and at the present time gall-bladder operations are common in every surgical clinic.

BILLIARY FISTULA (the continued escape of bile after an operation on the gall bladder). This accident was not uncommon 30 years ago. Dr Jones, of Rising City, Nebraska, read a paper in 1897 at the meeting of the Nebraska Medical Society, "On an improved technique for the avoidance of fistula after cholecystostomy" (i.e. drainage of the gall bladder). His paper was founded on experiments on dogs. He writes, "The principle involved in operations on the intestines of bringing peritoneal surface into apposition can be applied to gall bladder surgery." A careful technique, which he illustrates in his paper, made each experiment successful and in no case did a permanent biliary fistula occur. This method is the one now practised by all surgeons in the operation of drainage of the gall bladder in man.

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1667, and in the same year 10oz of blood was transfused into the vein of a man. It was thought good treatment for old age, anaemia, and lunacy.

In 1824 a solution of common salt was used instead of blood, and by the use of the salt solution it was found that a dog could be recovered which had been almost bled to death and which would have inevitably died if the salt solution had not been used. From the experiment was developed the general use in surgery of salt solution employed intravenously, subcutaneously, and

During the great war universal employment of blood and salt solution for infusion into the veins of wounded soldiers has been the means of saving tens of thousands of lives.

CANCER

Till the cause of a disease is discovered its treatment is empirical and generally futile. Cancer is increasing in this country. The discovery of its intimate cause and the way to cure it is the most urgent problem; there is none more urgent.

Mice are subject to cancer, and cancer can be transmitted from mouse to mouse. A small percentage of tumours in these animals retrograde and disappear and the mouse recovers. When such an event happens the mouse can no longer be infected with cancer, and further, the serum from the blood of the immune mouse is capable of arresting the growth of cancer in another mouse not immune to the disease.

This is a wonderful story, and perhaps is a finger-post of great moment to us in the search for the successful treatment of cancer in man. It is known that cancer in man occasionally retrogrades and disappears; but even if such a case was known at the present time we could not bleed the patient periodically (except by Act of Parliament passed by Antivivisectors), and if we did, how far would one patient's serum suffice to cure the tens of thousands of sufferers from this terrible disease? We are cognisant of an experiment which was carried out by two investigators in England some years ago in which an attempt was made to immunize a large animal against cancer and to produce in its blood antibodies in the hope that when the serum from its blood was injected into inoperable cancer patients, the growth of the disease would be arrested. One patient was treated with encouraging results, but the animal died while the investigators were away on their summer holiday. Since that time they have had neither leisure, money, nor a suitable place for the continuance of this research. Further, the law of England makes such a research onerous and difficult for everyone concerned. None but a criminal lunatic would deprive his child of the benefit of antitoxin treatment in diphtheria. Are the workers in this country, who are trying to solve the problem of the nature and treatment of cancer to be handicapped, bullied, and made outcasts by the criminal law?

CONCLUSION

It would not be difficult to continue this account of the bearing of experiments on the progress of surgery, but this letter is already too long. There must not be, and there

cannot be, any halt in the beneficent endeavour to relieve suffering and to cure disease. The knowledge gained by the toil of one generation becomes the commonplace of the next. Each generation has a duty before it to add its stone to the Temple of Knowledge. The tide of truth moves from incompleteness to completeness, from imperfection to perfection. We may forecast the future of perfection and fulfilment in our subject, surgery, as confidently as did Ferrier that of the effect of his experiments on the surgery of the brain of man; but the fetters of ignorance and prejudice must be loosed. Is it possible that there is in Britain any party which still holds that the members of our profession are “low down torturers of animals,” to use the suggestive phrase of your correspondent, who was protected from hydrophobia at the Pasteur Institute in India.

We are, Sir, your obedient servants

C A BALLANCE
W G SPENCER