

rents do not invariably beget unhealthy children; still their tendency to do so, and further to reproduce in their offspring the same diseases as they themselves were afflicted with, is a law as indisputable as that great one of like producing like, which is illustrated by the inheritance of feature, form, and character, of handwritings, of moods of thought, of methods of combined muscular movements, such as bestow similar expressions of countenance.

Whether scrofula can be acquired when it has no hereditary taint or structural debility to fasten upon, the possibility of its absolute acquisition is not so easy a question to answer. But, for our purpose, it is enough when we know that unfavourable conditions of life, bad or insufficient food, foul air, and overcrowding, if they do not actually engender scrofula, can kindle its tinder and fan its smouldering flame. And, again, any fever or accidental hurt, which injures the health, can develop the same latent constitutional vulnerability. If asked what is the reason of this preternatural vulnerability in scrofula, we can really only answer, something imperfect in the body. The humoralists localise this imperfection in the fluids; the neuropathologists, in the nerve-system. The cellular pathologist discards neither the humoral nor the neural view of the question. He says, "For me, the blood also is a tissue composed of cells and intercellular substance; only the intercellular substance is fluid. Doubtless this tissue may suffer changes which render it unfit to fulfil its functions at all times equally well. And so, too, of the nerves and nerve-centres; these, through defective function or structural error, may so influence the digestive organs as to render these incapable of forming healthy chyle, or of converting this chyle into blood, or of elaborating this blood into tissue. But the primary error, the first causes which you fall back upon in both your propositions, is not demonstrable, and merely shifts the difficulties, of which it offers no real solution, further backwards and more into the dark. They are plausible hypotheses, created, like the atomic theory, to meet a certain array of facts, but not equally happy in answering the purpose. Now, on my part, I offer you only what you can see for yourselves—a distinct abnormality—something wrong developed or out of place in the part wherein it is found. As to the fundamental cause of this error, I can only appoint this in some structural weakness in the cell or tissue that first presents it. In scrofula, this particular weakness of construction appears to reside in the lymphatic apparatus, and to consist in the vulnerability of this to impressions or irritations from without. But you may ask, and very fairly ask, What do I mean by vulnerability?"

Habit has been called the memory of the body; and there are habits of right in the perfect adjustment of supply to demand implied by perfect nutrition, which more long continued performance becomes as it were a guarantee for. That which has been performed well for a long time is all the more likely to continue to be well performed.

But while the body is building, growing—a process (and this is a most important point) never carried on after foetal life with equal activity everywhere—there is a disturbing agent ever at work. One or other part is not only being maintained at the expense of the nutritive fluid; it is also being further developed and perfected. It remains, I think, easy to see that just this weight in excess of perfect counterpoise becomes an item of possible misapplication; it is the extra strain upon the memorial instincts of the body, which cannot at all times and under all conditions be equally well supported. This explains the vulnerability of infancy

and childhood to all disease. Again, organs which are at one time being actively used, and at another only passively nourished, pass through great and rapid variations of state; this renders them vulnerable. Now, the lymphatic system appears the vulnerable part in scrofula. The lymph-glands and their vascular prolongations are so far weakly constructed that they get thrown out of gear more easily than they ought. This is that structural debility whose existence I plead for, and which has been long since allowed by so many medical authors, under the insufficiently precise expression of a scrofulous taint.

## ON THE ELECTROLYTIC TREATMENT OF TUMOURS AND OTHER SURGICAL DISEASES.\*

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THAT cysts may be successfully treated in the same manner, is shown by the following.

4. *Case of Hydatids in the Muscles of a Horse: Operation: Cure.* On November 22th, 1866, Mr. T. Mavor, of Park Street, Grosvenor Square, begged me to see a horse, eight years old, which had a large hydatid tumour in the muscles of the left hip. It had been treated by acupuncture and lancing, and had become somewhat smaller in consequence of the suppuration established in the cysts. There were several abscesses still discharging.

Needles connected with ten cells of the battery were introduced into several parts of the tumour, and the operation repeated on December 3rd. From the time the galvanism was first applied, the tumour shrank rapidly, and the horse is now recovered. At no time was there any inflammation, suppuration, or sloughing, from the electrolytic applications; the only symptom observed being that of shrinking.

I have no doubt that the same result would be obtained in hydatids of the human liver—an affection for which a safe and quick mode of treatment is still sadly wanting.

Let me add that, although small tumours are more readily removed than large ones, the mere size of a tumour is no impediment to the electrolytic treatment. Large tumours take a longer time to remove than small ones; but the efficacy of the operative proceeding is the same, whatever may be the conformation of the growth. Pediculated tumours are, for obvious reasons, more readily removable than those with a broad base.

A larger experience than I command at present will be necessary to decide the question, whether the electrolytic treatment will supersede the other methods of treating cancer. In consequence of the extreme hardness of scirrhus, the destruction of that form of cancer by electrolysis requires a much longer time than that of the soft medullary form. The method, however, may be usefully applied in every variety of cancer; and it seems to be of little consequence whether or not the tumour adheres to the bones—a circumstance which often renders removal by the knife difficult or impossible. I believe that, in this most terrible disease, the electrolytic method will be found generally useful, not merely by removing the present tumours, but also by so modifying the nutrition of the parts concerned that no relapse is likely to take place there; and, if com-

\* Concluded from page 540 of JOURNAL for May 11th.

bined with an energetic constitutional treatment, which should in no case whatever be neglected, it may thus indirectly help towards the eradication of the cancerous diathesis. It is a curious fact, that the peculiar lancinating pains of cancer generally seem to disappear, or at least to diminish considerably, soon after the commencement of the electrolytic treatment, and long before the whole tumour is destroyed.

## II.—DISEASES OF BLOOD-VESSELS.

*Aneurisms* have been frequently treated by galvano-puncture; but, although some favourable results have thereby been obtained, the number of failures is vastly larger than that of the successes, so that, at present, the operation of galvano-puncture is, by the best authorities, proclaimed an unsafe and unreliable proceeding. Sir William Fergusson, in his *Manual of Surgery*, curiously enough, ignores it altogether. Professor Pirrie justly remarks, that the operation is founded on the principle of the galvanic current having the power of coagulating the blood; and that this principle is not sound, as stratified fibrine is the substance by which we desire to solidify an aneurism, and not coagulated blood; that the proceeding is also very painful, and not unattended with danger, and the results are not encouraging." Mr. Ernest Hart, in his article on Aneurism in Holmes's *System of Surgery* (vol. iii, p. 432), says: "It is a radical defect of this procedure, that it acts by inducing direct or passive coagulation of the blood in the sac. Hence, it is inherently uncertain, liable to cause relapse by the melting of the coagulum, or inflammation by its too sudden deposition. Again, it is very capable of exciting inflammation in the walls of the sac. Then, too, the needles sometimes produce eschars at the points of their insertions, and thus give rise to consecutive hæmorrhage. Galvano-puncture appears, then, at present, to deserve to rank only as an exceptional expedient. Its claims will have to be considered by the practical surgeon principally when he is called upon to treat either aneurism at the root of the neck, or internal aneurism, which cannot be reached by digital or mechanical compression, and some forms of varicose and cirroid aneurism seated superficially. The dangers and imperfections of the process must restrict its application, even in this limited field; but, as a resource available in cases where neither compression nor ligature can be advantageously applied, it has a sphere of useful action."

M. Broca and most other eminent foreign surgeons entirely coincide in this view; and it may be said, therefore, that the proceeding has not established a firm footing in surgery; nor ought we to be surprised at this fact, for I think I have already said enough to show that the mode of applying galvano-puncture for aneurism has hitherto been utterly wrong.

If anything is well established in the pathology of aneurism, it is the fact that clots which have been rapidly produced and made to block up the sac can be easily discussed or washed away by the current of blood; that they often give rise to consecutive inflammation, suppuration, and gangrene, and are unstable in the highest degree.

It is quite true that in some cases this quick coagulation has been followed by permanent consolidation. Such cases have occurred in the practice of M. Pétrequin and other surgeons; but, on analysing these observations, we can have no doubt that, in the cases which have turned out successful, there existed a peculiar condition of the blood highly favourable to the deposition of lamellated fibrine, and that this is so exceptional a circumstance as only to prove the rule, which is that the passive clot is

rather prejudicial than otherwise. *Immediate coagulation should, therefore, be entirely eschewed*, instead of which we should endeavour to obtain a slow deposition of fibrine, whereby the sac may be permanently obliterated. For this purpose, it is necessary that circulation should be merely diminished and retarded, but not altogether interrupted in the sac. As soon as any deposition of fibrine has taken place, this has a tendency to attract fresh fibrine from the blood, whereby its bulk is gradually increased, until the whole sac is filled up. The wall of the aneurism is thus strengthened, and it is enabled to resist the action of the heart, until the time when the cavity is finally obliterated.

That this can be accomplished by placing the negative pole of the battery into the sac, and the positive pole outside, I am convinced, from experiments in rabbits, in which I have thus gradually obliterated the femoral artery. But there is, also, one curious case recorded in a recent treatise on medical electricity by Dr. Frommhold, of Pesth, which bears out my assertion. This author, whose acquaintance with the physical aspects of electricity is of the most superficial kind, thought to do the right thing, when having a case of aneurism to operate upon, by putting the positive pole into the sac, and the negative pole outside; but not knowing which was the positive, and which the negative, as is evident from the details of his description, he used by mistake the negative pole for the sac, and the proceeding proved entirely successful. There was no immediate coagulation; but the tumour began to become gradually harder a few days after the operation, and it would appear that at last obliteration of the sac was effected. Dr. Frommhold was thus successful in spite of himself and his want of knowledge; his case is, however, for all that, not the less interesting, because it is the first case of aneurism which has been cured by the negative pole, and thus goes far to prove the correctness of my principle, that it is to the use of this pole that we have to look for the cure of aneurism.

I regret to say that hitherto I have not had the opportunity of operating in a case of aneurism in this manner; but I shall do so as soon as a suitable case presents itself, and beg most strongly to recommend surgeons to give this method a trial, as I believe it will be found the easiest, safest, and most successful way of dealing with such tumours.

The same considerations apply to the treatment of *varicose veins, varicocele, and piles*.

## III.—SEROUS EFFUSIONS.

These effusions may, as a rule, be cured by anything that causes an alteration in the secret function of the serous membranes. It may therefore be supposed that the continuous galvanic current, which can effect such an alteration mechanically by the hydrogen which is developed, chemically by the free alkali which appears at the negative pole, and dynamically by its special action on the vasomotor nerves, will in course of time prove of the greatest value in treatment of serous effusions, such as hydrocele, hydrops articuli, hydrothorax, hydropericardium, etc.

I have not yet had the opportunity of ascertaining by experience the precise value of this plan in serous effusions; but as several cases of hydrocele have been cured by continental surgeons, even with the old method of galvano-puncture, I do not think that my expectations as regards this point are likely to be disappointed.

Whatever may be said by the supporters of the operation of paracentesis of the thorax for *pleuritic effusions* and *empyema*, it is very certain that the

profession as a whole, look with considerable distrust upon that proceeding. It cannot be denied that the sudden withdrawal of a large quantity of fluid sometimes induces collapse, and the introduction of air into the pleural cavity is also frequent enough. At the same time, suppuration generally takes place after the operation, and the patients often sink from exhaustion or pyæmia. I may perhaps be allowed to recall here the remarks made ten years ago on this operation, by a great master, the late Dr. Addison, who had, from the numerous cases seen every year at Guy's Hospital, come to the conclusion that paracentesis of the thorax was one of the worst and most deceiving operations in general practice. (*Lancet*, 1855, vol. ii, November 17th.) "A serous cavity," Dr. Addison said, "is almost invariably changed into a cavity pouring out purulent matter by the first operation, and the thick leatherlike false membranes lining the pleura soon make the operation one of great difficulty and danger."

Whether we shall ever feel justified in applying the electrolytic treatment to cases of hydrocephalus, for promoting the absorption of the serous fluid in the head, I do not venture to decide, since in this affection there are almost always pathological conditions within the cranium which would seem to render

any permanent benefit doubtful, if not impossible. I think, however, the plan would answer very well in certain cases of *spina bifida*, especially where we have reason to believe that the cord may be absent from the sac, and where the tumour adheres to the bones of the spinal column by means of a pedicle. That the fluid would be absorbed, and the tumours shrink under the influence of the electrolytic treatment, may, I think, be expected with a considerable amount of certainty.

I therefore here suggest the idea, hoping that it may perhaps be carried out at some future time, if a suitable opportunity should present itself.

#### IV.—STRICTURES.

Whether in strictures of the urethra and rectum the electrolytic plan will ever be necessary, I must leave my surgical brethren to decide.

There are so many really useful and good operations for these affections now practised, that I do not think another method necessary. It is, however different with strictures of the œsophagus, to which I believe the electrolytic plan eminently adapted, as that affection has hitherto offered insuperable obstacles to treatment, and generally led its victims through a terrible series of sufferings to

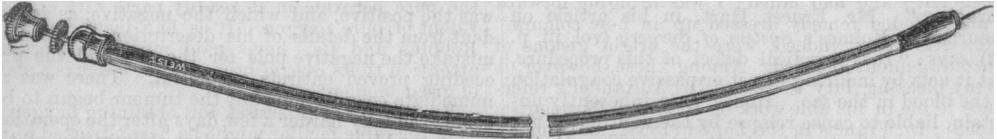


Fig. 11.

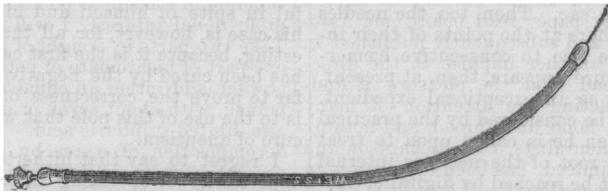


Fig. 12.



Fig. 13.

death from starvation. I have therefore had an instrument constructed for the treatment of such cases. (Fig. 11.) This is an œsophagus sound, perforated in the middle so as to leave a canal for a conducting wire which ends in a needle. It may be introduced closed, and by a simple contrivance, the hidden needle may be brought out, and applied to any point upon which we may be desirous to act.

Fig. 12 represents an instrument which may be used in the same manner for strictures of the urethra and the rectum.

In conclusion, I will say what I believe to be the advantages of the electrolytic method over other surgical proceedings. If carefully applied, it causes no bleeding during or after the operation; there is no shock to the system; it causes very little pain, so that, as a rule, no chloroform or ether spray are necessary; no inflammation, suppuration or sloughing are apt to follow, and the patients may, during the progress of the treatment, pursue their usual avocations, being not obliged to stay in bed or even indoors. If the electrolytic treatment is not as quick as the knife, it is, on the other hand, exempt from the dangers which may follow all cutting opera-

tions, and it will on this account, be probably preferred in many cases where less safe proceedings have hitherto been employed, and where the delay of a few days or weeks appears to be of little consequence.

In concluding this paper, I would urge my surgical brethren to give their attention to the principles I have proposed, and a trial, in suitable cases, to the plan of treatment I have recommended; being convinced that, as the method rests on sound physiological bases, and has already been tested with satisfactory results in practice, it must, from the peculiar advantages inherent to it, prove extensively useful in the treatment of a large and important class of surgical diseases.

DARJEELING AS A CONVALESCENT DEPOT. The *Friend of India* states that the Commander-in-Chief is so much pleased with Darjeeling, that it is to be raised from a first to a second class convalescent depot. Darjeeling is unusually empty this season, and prices are very high, purchasers being few. Since Dr. Campbell's time, the sanitarium has not had fair play as to its superintendent.