

naturally suppose that if the ascitic fluid were the only cause of the constitutional effects, tapping should answer a similar purpose. But experience so far has taught us that this method of surgical treatment has so far excelled any former method, that we are justified in adopting it in all suitable cases. And we can only express our regret that the seriousness of the operation will prevent its frequent adoption by the general practitioner, and deter the patient from submitting to so severe an ordeal.

The surgeon is thus encroaching, step by step, on what was formerly considered the exclusive domain of the physician. The brain is now largely submitted to surgical control. The liver and the kidneys are subject to direct investigation as well as most other abdominal organs, and now so medical a disease as tuberculosis is attacked, and in some degree subdued by this aggressive surgical knife. This may be, and probably is, a result of the natural law of the survival of the fittest, to which even great physicians must submit as well as all others; for by the universal operation of so important a law, not only science, but the world advances and is improved.

### THE MICRO-ORGANISM OF VACCINIA.

Much interesting research has attended the investigation of the nature of vaccine virus. Not only have scientists given much thought to the subject, because of its scientific interest, but more utilitarian reasons have been added to spur investigators to the unravelling of the mystery which surrounds the subject. There has been (*Lancet*) a reward of £1000 offered since 1883 by the Grocer's Company of London, for the discovery of a "method by which the vaccine contagium may be cultivated apart from the animal body, in some medium or media not otherwise zymotic; the method to be such that the contagium may by means of it be multiplied to an indefinite extent in successive quantities, and that the product of any number of such generations shall (so far as can within the time be tested) prove itself of identical potency with standard vaccine lymph."

Among many papers on this subject, that of Dr. Neil Carmichael, read before the Philosophical Society of Glasgow, is of great interest and importance. He has found that micrococci, often in

chains are always present in vaccine lymph, whether this be humanized, or from the calf; and that no other organisms are present. He concludes that these organisms are the active principle of virus, giving the following reasons:—"They are invariably present in vaccine lymph, are uniform in size and other characters, and abound most in the purest and most active lymph; (2) they are the only living organisms found in vaccine lymph; (3) they multiply enormously when the lymph is planted on the calf or human subject, in the vaccinated tissues and subsequently in the vesicles, and this active proliferation is coincident with the active development of vaccinia; and (4), from their resemblance to other specific micro-organisms—for example, those of pneumonia and erysipelas.

For ten years past Dr. Carmichael has been experimenting on the production of artificial lymph, by cultivation. His attempts at vaccination with this cultivated lymph have not been very successful, but sufficiently so to prove the necessity for further research in this direction. He makes, as the results of his investigations the following statements:

"1. We have succeeded in cultivating the vaccine contagium in the form of a crop of micrococci, the progeny of the micrococci of ordinary vaccine lymph. 2. We have found that its failure in 90 per cent of the cases proves it to be of lessened infective power, and for purposes of general vaccination entirely unsuitable. It is of lessened infective power, but not necessarily, when it does succeed, of lessened protective power. It is not, I think, a truly attenuated lymph, because when it does succeed its success is perfect. It is lymph which, by naturalisation in a new soil, has become less infective—that is to say, less ready to germinate than the old. 3. We have succeeded in producing vaccinia in a number of children (10 per cent. of the cases) apparently susceptible, in a special degree, by inoculation of these cultures. 4. These occasional successes serve as a fresh starting point for the renewal of lymph, enabling us, not certainly to obtain a sufficient supply for general purposes of inoculation, but yet enabling us, in a soil not otherwise zymotic, to cultivate the contagium of vaccine lymph, and so to secure a fresh untainted renewal of our lymph."

### COMMUNICATIONS TO THIS JOURNAL.

We solicit communications on all subjects of interest to the profession. It is our desire to make this Journal a practical helper to the physician and