Part Second.

REVIEWS.

The Microscopic Organisms found in the Blood of Man and Animals, and their Relation to Disease, 1879. By Timothy Richards Lewis, M.B., Special Assistant to the Sanitary Commissioner with the Government in India.

The first part of this valuable treatise gives a very good résumé of what is known of the vegetable organisms found in the blood, with some original observations by the author. The literature of this department of botany has grown to such inordinate proportions within the last few years, that we cannot but feel grateful to any one who has found patience to wander through the intricacies of the subject, and to place the salient points in so clear a light as the author has done. Mr Lewis has managed to distil a very concentrated essence out of a vast mass of raw material, and any one wishing to see at a glance how much has been done in the elucidation of some of the very complex problems connected with the subject will do well to peruse this part of the work. It gives an excellent synopsis of the opinions held by most of our greatest cryptogamic botanists, and shows how much there is still to do in this line of research. The author does not seem to be a disciple of the "contagium vivum" theory, believing as he does that the poison of septinous fluids is other than the organisms found in them.

Part II. is descriptive of the protozoa found in the blood, and in it a flagellated organism is described as occurring in the blood of the rat, which apparently had not previously been described.

Part III., from its originality, is perhaps that which will be of greatest interest to most readers, and treats of the helminthic haematozoa of man and animals. Most of us are already familiar, from Mr Lewis's descriptions, with the filaria sanguinis hominis, discovered by him some years since, and afterwards studied in relation to disease by Manson, Bancroft, and others. The first published record of the occurrence of this nematoid haematozoan in the human blood was given by the author in a paper submitted to the Government in 1872, and since then his observations have been confirmed and extended in China by Manson, in Australia by Bancroft, by Sonsino in Cairo, and by Gabb in this country. It appears that nematoid worms are of frequent occurrence in the blood of the lower animals in India. The blood of the Indian jay and crow is infested by them, and two or possibly three mature parasites have been found associated with embryos in dogs. They infest the substance of the heart, arterial walls, and subcutaneous
textures as well as the blood, and, curiously enough, seem to give rise to no particular symptoms. The filaria, so abundantly found in the human blood in India, is in an embryonic condition, and does not seem often to reach maturity in its human host. Bancroft described the mature worm as occurring in an abscess and in a hydrocele of the cord; and Lewis, after many hours' search, found it once in an instance of naevoid elephantiasis. The embryo worm found in the human blood is of small size, a little less than a coloured blood-corpuscle in diameter, and might be easily passed over in a hurried examination. As many as eight or nine of them may be found in one microscopic preparation of the blood. The mature worm, however, appears to be much larger. The author mentions the following points among others as distinctive of the specimens of the mature worms he found in the case above alluded to. They were in a mangled condition, due to the difficulty of isolating them, but, notwithstanding, exhibited very lively movements. They were of a white colour, and the cuticle was smooth and devoid of transverse markings, except such as were due to the contraction of the subjacent muscular walls. The male measured 1-180th of an inch transversely and half an inch in length, while the portion of the female secured measured 1½ inch, and its greatest width was 1-100th inch. The female was packed with ova and embryos in various stages of development; the latter, especially those of them which were mature, manifesting active movements. The head was slightly club-shaped; the mouth did not show any very distinctly marked labial subdivisions, nor were there any chitinous processes evident either before or after death. The oesophagus was faintly striated, and shaded off imperceptibly into the intestinal tube, the latter being filled with moleculo-granular matter. The ovum had no distinct shell, the only covering being a thin delicate pellicle, which was easily compressed, so that the ovum was constantly liable to differ in shape.

The manner in which the filariae gain entrance to the human system has been the subject of special investigation by Manson in China, and Lewis has been able to confirm all that the former author wrote in regard to the mosquito acting as an intermediate host. It can be demonstrated that, after the mosquito has fed on a filaria-affected person, the stomach of the insect will contain living examples of the hematozoon, and that the latter will make considerable progress towards maturity therein in the course of a few days. They do not become digested in the stomach of the mosquito, but make their way into its tissues, and then reach a high state of development. He has never seen the worm reach full development in the body of the mosquito, the insect always having died before this took place, but the stage reached was so advanced that there seems a great probability that the mosquito acts as the intermediate host. Lewis found that fourteen per cent. of the insects caught
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at random contained filariae. The manner in which they gain admission to the human body is supposed to be that they escape from the body of the mosquito when the latter dies in the water, to which it betakes itself, and the filariae thus find their way into the human system.

So far as the author's observations go, he does not seem to have distinctly made out that these nematoid blood-parasites produce any constant symptoms. He has, however, always found them associated with two diseases, namely chyluria and lymph-serotum or naevoid elephantiasis, but whether they are the cause of these he cannot say, and seems to regard this relation as doubtful. The fact of their being abundantly found in the blood of persons who do not suffer from these affections, is against their being the cause. It is possible that a special nematoid is capable of originating these diseases, while others prove harmless, for, as the author believes, they may be the embryos of various species of nematoids and yet bear a close resemblance to each other in their embryonic state. That beings become asphyxiated on account of their presence in the blood he regards as untenable, and, indeed, to use the author's own words, "So far as we at present know, it would seem that the presence of embryos in the blood, no matter how numerous, exercise no marked deleterious effect on the organism."

In conclusion, we must express the great satisfaction we have had in perusing Mr Lewis's book, and we are convinced that it will be the feeling of all who read it, that it bears the stamp of most painstaking and original scientific research in a direction which some day may lead to valuable results.

On Certain Effects of Starvation on Vegetable and Animal Tissues, 1879. By D. D. Cunningham, M.B., Special Assistant to the Sanitary Commissioner with the Government of India.

The author of this Government Report has made a series of experiments on plants and animals with a view to determine what histological changes ensue as the effect of insufficient food supply or its complete withdrawal. He has further applied the results of his experiments to the explanation of the so-called famine-diarrhoea or famine dysentery. The experiments on vegetable organisms were conducted on plants belonging to the mucorine order of fungi, and consisted in cultivating them or endeavouring to cultivate them in distilled water. A fatty change and ultimate disintegration of the protoplasm seem to have been the general results of insufficient nutrition when applied to the fungi experimented upon.

The experiments on animals were made on tadpoles, on account