

stage of decay; (2) that this organic matter be broken up and intimately mixed with mineral matters; (3) that the soil be maintained in a moderate but constant state of humidity. The febrigenous agent being once developed, there are atmospheric movements which carry it from its original locality, it being, however, readily stopped by trees, not travelling more than two or three leagues, and not rising more than two or three hundred metres above the soil. He says there are good reasons for believing this agent to be an organized being; and to-day there are really but two organisms which are set down as being the direct cause of malaria, the bacillus of Tommasi-Crudeli and the infusorian of Laveran. Of the bacillus of Klebs and Tommasi-Crudeli, he says, "It is an *aerobic* living in the air, the water, and the soil of the Pontine marshes. In the soil of marshy regions it appears under the form of motile spores, refracting strongly the light, elongated and oval, its greatest diameter being ninety-five thousandths of a millimetre. But in the living organism and in liquid cultures, its evolution changing, its aspect changes." It is then represented by long filaments which at first homogeneous, divide transversely and in segments which form spores. This gives the fever to the inoculated rabbit, which it sometimes kills, it having a swollen liver with blackish leucocytes and filaments characteristic of the bacillus. The liquid of these cultures is inoffensive if filtered, while the residue produces symptoms of paludism. Cecci has found its spores in the blood of inoculated rabbits, Marchiafava found it in the blood of patients sick with intermittent. Ferraresi, Valenti Piccirilli, found them in the liver even of patients; Klebs and Tommasi-Crudeli reproduce it by the culture of malarial blood. Maurel, thereafter describes Laveran's *oscillaire malarie*, under the different forms described in Osler's article. He says, "Of these, the filaments are the essential elements, and seem to indicate the adult stage of these microbes of paludism. After having completed their development, they set out to play during a certain period an independent existence in the blood serum." After considering the whole question, Maurel inclines to attribute the appearance of the parasites of Laveran to deformities of leucocytes which come to appear, at a later stage, as the characteristic lesion of fevers, the more marked and general as the fever is more severe.

The second and third parts enter into the technique and description of the personal researches of the author. Some of his conclusions are, that in salubrious districts infusorians of a low order are completely absent; those of the least perfect organization are the rarest; amœbæ themselves under the most elementary form are not encountered in such; the same is true of the diatoms, of which one finds only the carapaceæ carried, doubtless, by winds; water from roofs ought to be considered dangerous if it be not properly filtered. The water of our cisterns received from slate or zinc roofs have abundance of living animalculæ, those from wells much fewer, as also those from running water. Wholesome air always presents *bacterium termo* and nearly always some fungoid cells.

This exact and extended work insists upon the necessity for the *micrograph* in order to understand properly normal blood in a cold or temperate climate before studying it in a tropical country, where heat alone deforms leucocytes and renders them unrecognisable, in consequence of their amœboid mobility and their pigmentation. Pigment granules exist in the leucocytes as in the free state, but he has never seen them in the *hematies*. The water of the marshes, though filled with organisms, showed nothing characteristic. The air of the marshes is much richer in micro-organisms, especially in bacteria and filamentous algae. Do these infinitely small forms penetrate into our tissues and blood? His researches in this respect have been in vain. However, Laveran's motile filament is in the blood as an indisputable fact, with movements most like the spirillum. It is necessary to conclude that the paludian amœba is poisonous or emits poisonous products.

The opinion of the author in concluding is, on the whole, that all definitive conclusions are premature, and the latter researches have demonstrated that flagellate bodies can appear in macerations of liquids foreign to the organism, which facilitates the criticism of the hypothesis of Laveran on the subject of the presence in the blood of a sufferer from paludism.

The study of these becomes the necessary precursors of all correct conclusions, regarding the local conditions favoring malaria, and we seek eagerly for solutions of these questions in order that the conditions under which malaria prevails so widely in many parts of the Province may as speedily as possible be removed.