

MEDICAL SCIENCE

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ORIGINAL ARTICLES.

HÆMATOZOA OF MALARIA.

BY WILLIAM OSLER, M.D., F.R.C.P.

Extended Abstract of Monograph kindly given by the author.

(Continued.)

Types of Malaria Studied.—Of the seventy cases examined, a majority were instances of ordinary intermittent fever, chiefly quotidian and tertian, with two quartan cases. There was one case of remittent fever, one of comatose pernicious malarial fever, and the remainder were cases of malarial cachexia or chronic paludism, with occasional outbreaks of fever, with or without chills. In all the cases, with the exception of seven, one or other of the forms above described was found in the blood.

Influence of Medicines on the Organisms.—Quinine invariably caused the pigmented bodies to disappear. In acute cases, which were usually studied during two or three paroxysms before the administration was begun, this observation was repeatedly confirmed. In a few cases the corpuscles were entirely free; in several instances, the crescents appeared before the blood became normal.

Nature of the Organisms.—It is very evident that we are dealing here with structures unlike any others which have been described in human blood, and with bodies which have no relation whatever to the spirilla, micrococci, and bacteria of certain acute diseases. I would call attention to the remarkable unanimity in the description of these parasites by Laveran, Richard, Marchiafava and Celli, Councilman, Golgi, and myself. Laveran's original description is well-nigh complete, and subsequent workers have done little else than confirm

his results, though to Marchiafava and Celli is due the credit of insisting upon the amoeboid character of the intra-cellular form.

Relation of the Parasites to the Disease.—The same difficulty meets us here as in so many affections in which micro-organisms have been found: Are they pathogenic, or are they merely associated with the disease, which in some way furnishes conditions favourable to their growth? As evidence of their pathogenic nature may be urged, with Laveran, the constancy of their presence, their absence in other individuals in malarial regions, the destructive influence upon the blood-corpuscles, and their abundance in the graver forms of the disease. But even these considerations, weighty as they may appear, will not carry conviction at all, in the absence of experimental demonstration such as can be afforded in the case of certain pathogenic schizomycetes. Attempts to isolate and grow these hæmatozoa outside the body have failed. Marchiafava and Celli have shown that the inoculation of healthy persons with blood from a case of malaria is followed in a variable time by genuine ague paroxysms, in which the blood contains the parasites; but in regions where malaria is prevalent such experiments are not wholly free from objections.

To my mind, two facts in connection with these hæmatozoa point significantly to their etiological association with malaria. First, the positive anatomical changes which can be directly traced to their action, changes upon which one at least of the most marked symptoms of the disease depends; I refer to the destruction of the red blood-corpuscles, which can be followed in all its stages, and is as well-defined an alteration of tissue brought about