

LEAGUE OF NATIONS.

C.H./Malaria/270.

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HEALTH ORGANISATION:

MALARIA COMMISSION.

The Secretariat of the Malaria Commission has the honour to communicate the attached note by Doctors L. Parrot and A. Catanei on

FACTORS CONNECTED WITH THE OUTBREAK OF MALARIA EPIDEMICS IN

ALGERIA.

We have been able, in exceptional conditions which it would be impossible to obtain artificially, to study the natural development of three kinds of malaria infection (malignant tertian, benign tertian and quartan) among an Algerian population riddled with malaria, having no access to medical treatment and temporarily removed, as a result of accidental circumstances, from all risk of malarial infection or reinfection: throughout the season during which malaria is transmitted, rains of abnormal frequency and violence prevented the formation of anopheline breeding sites in the district. A population consisting of 1878 natives of white race (Berbers) continued its accustomed way of life in the same habitat, and with the same diet, and for 14 months was subjected to a monthly or fortnightly microscopic blood examination.

These cases, which were, we repeat, free from recent reinfection, showed that malaria occurred twice as frequently among persons under 15 as amongst adolescents and adults; attaining its maximum frequency between 6 and 10 years of age. In persons of all ages, the variety of Plasmodium most frequently observed was P. praecox (P. falciparum), the agent of malignant tertian. From 11 to 15 years of age, the frequency of the malignant tertian parasite decreased by about one-third, that of the benign tertian parasite by half and that of the quartan parasite by four-fifths; after the age of 15 and up to that of 50 years the index of specific infection remained at a more or less constant figure for each Plasmodium. In all infected individuals the three kinds of parasite were generally scarce in the peripheral blood stream, especially in the case of adolescents and adults. The percentage of gametocyte carriers amongst them varied considerably according to the Plasmodia, being small in the case of malignant tertian Plasmodium praecox (5 per cent), comparatively high in that of benign tertian P. vivax (42.8 per cent) and reaching its maximum in the case of quartan P. malariae (63.6 per cent).

These observations tend to confirm the theory that premunition, as understood by Edm. SERGENT, L. PARROT and A. DONATIEN, that is to say, the resistance of the infected organism to endogenous multiplication of malaria parasites and to exogenous reinfection, generally occurs in the native white population of Algeria at about 10 years of age; it takes place less early, and is less complete and less lasting in the case of malignant tertian P. praecox than in the quartan P. malariae and, more especially, in the benign tertian P. vivax.

Owing to differences in behaviour on the part of the three Plasmodia in regard to the production of sexual forms (adult gametocytes), old cases of benign tertian (P. vivax) and quartan (P. malariae) form a reservoir of malaria virus in Algeria much more favourable to the maintenance of an endemic state, even with a low anopheline density, than old cases of malignant tertian (P. praecox). However, owing to the fact that acquired premunition persists a long time in the case of P. vivax and P. malariae, these two species rarely cause violent epidemics affecting a large number of adults. On the other hand, the propagation of P. praecox takes place less easily in normal conditions; it occurs on a large scale only as a result of accidental circumstances, especially excessive breeding by the anopheles which transmit the disease. At such times, malignant tertian appears in those epidemic, or even pandemic, summer or autumn outbreaks familiar in North Africa, when everyone suffers without distinction of age, since in many adults premunition against P. praecox, which is not generally of a lasting character, has been lost between one epidemic and the next.

The important part played by this human factor of premunition in the outbreak of malaria epidemics in North Africa is therefore obvious.

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