11. Title: A SIMIAN MALARIA ISOLATED IN THAILAND

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Objective-

There are few, if any, records of simian malarias in Thailand. The discovery of Plasmodium in monkeys in Thailand is of interest not only because of possible transmission to man but also because comprehensive studies on newly isolated simian strains may illuminate some of the problems related to the malarias of humans.

Description-

Macacus irus (MS-25) monkey which came from Trang, S. Thailand. was purchased from a local animal dealer. Upon the routine examination given to all newly acquired monkeys this animal was found infected with a Plasmodium. The parasitaemia was scanty although daily examination for approximately two months has shown the Plasmodium to be consistently present in peripheral blood. The irus monkey showed no symptoms of infection and at no time has the daily morning temperature been above 102° F.

Five ml. of blood from MS25 were inoculated intraperitonealy into a splenectomized M. rhesus (MS23) of Thai origin. This animal had been given a course of 4-amino and 8-amino-quinolines and was known to be free of infection. Six days after inoculation parasites were first seen. The daily parasitaemia and temperatures of this animal are shown in fig. 1. The fever peaks correspond, as expected, with peaks of parasitaemia. During the first parasitic attack the parasite density rose to almost 500/10,000 rbc. Weekly serum samples are being taken in order to study various aspects of blood chemistry as the infection progresses. Comprehensive studies on host physiology are underway and will, in general, follow the plan of study for human host physiology in malaria so that a picture of comparative disease patterns might be developed. These investigations are still in their early stages and it would be premature to report on the results gained from a single animal.

The parasite has been tentatively identified as P. inui. However there are certain characters that do not conform to the classical description given by Sinton (1934). One of us (R.D.) is in possession of Sinton's original notes and drawings on simian malaria and from this material the impression that ours is a different type or strain tends to be confirmed. There is a growing realization that P. inui from different parts of Asia may show marked variation and that a careful study of the inui complex is needed to establish the taxonomic position of these variants. One of the most unusual features of the Thai isolate is the relative abundance of accole' forms which develop first as a large extrusion with a prominent vacuole and then grow inward into the host erythrocytes as the development to schizogony proceeds. This progression of forms is illustrated in fig. 2. These drawings are done in a stylized fashion but a detailed description with colored illustrations is being prepared. Schizogony seems to be completed at mid-morning. There are from 10-16 merezoites in the mature schizont the lower numbers being more commonly seen. The effect on the host cell is notable. There is no enlargement of the parasitized erythrocyte but with the development of the trophozeite, the host haemoglobin rapidly disappears until, usually, only the cell membrane is apparent by the time the mature schizont has developed. Faint stippling of the Zieman dot character is usually evident. it is our impression that stippling is more prominent in infected

cells following crisis when immature erythrocytes such as nucleated forms are found in the blood. Macrocytes, some of which are probably reticulocytes. appear in numbers after the second week of the infection but parasites have never been observed in these cells. Microcytes, on the other hand, are frequently invaded. The sequential haematological and bone marrow changes are being studied in cooperation with Dr. Tanomsri of the Royal Thai Airforce Hospital.

In cooperation with Dr. Gould it has been possible to show that the parasite readily develops to the sporozoite stage in Anopheles balabacensis. Cyclical transmission has been accomplished, parasites first appearing 19 days after the bites of three infected mosquitoes.

A malaria parasite in a naturally infected gibbon from Thailand has recently been found. However final identification as to species has not as yet been made.

Summary—

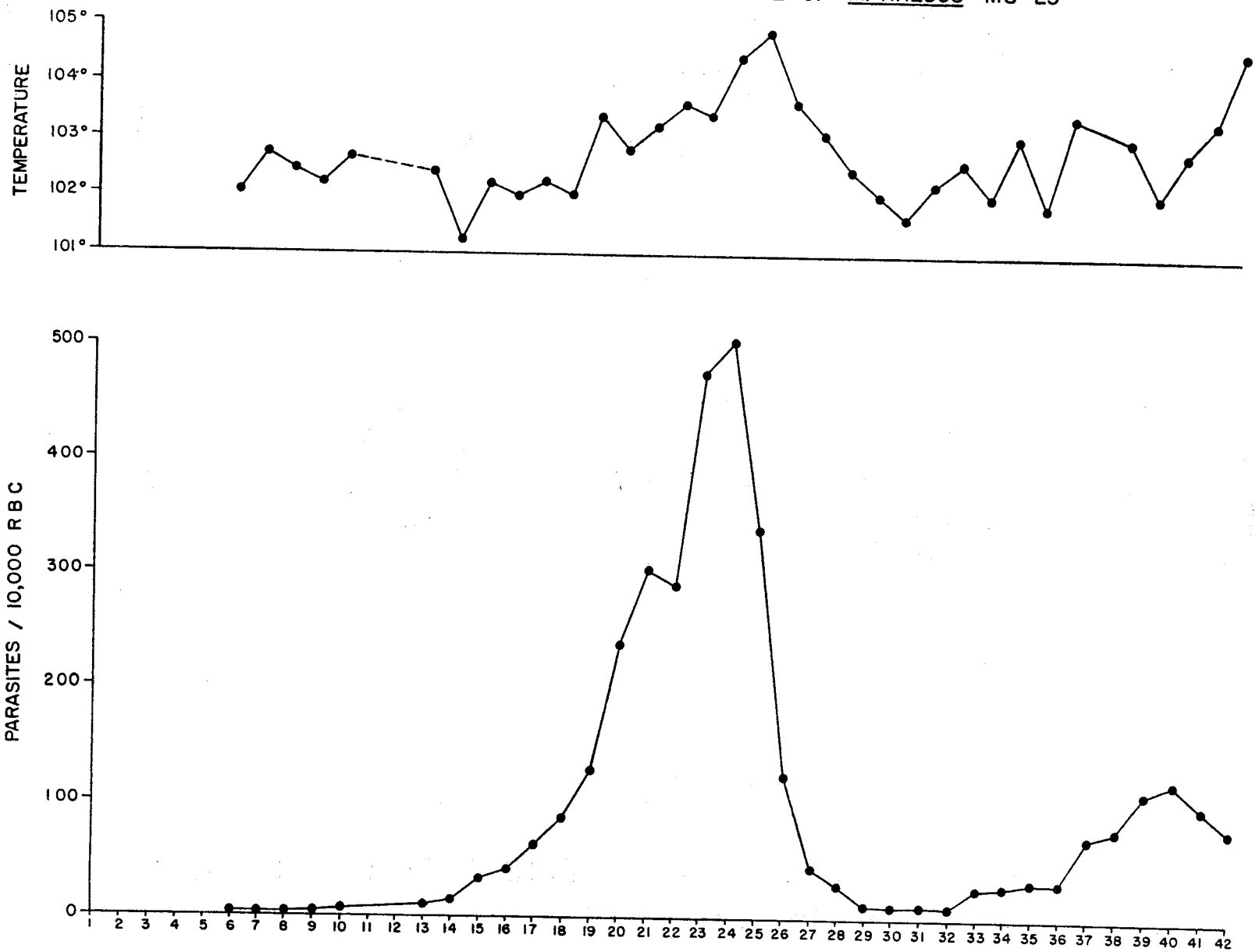
A simian malaria tentatively identified as P. inui has been isolated from an infected M. irus monkey which came from S. Thailand. Certain characters of the parasite, such as the relative frequency of accole forms which proceed to develop outward from the erythrocyte, do not conform to the classical description of P. inui. Detailed morphological studies are in progress.

Various parameters of host physiological and immunological responses are being studied. It is our impression that this strain might be a useful model for the study of sub-acute malaria.

References—

Sinton, J.A. 1934. A quartan malaria parasite of the lower oriental monkey, Silenus irus (Macacus cynomolgus). Records of the Malaria Survey of India, 4, 379-410.

FIG. I. PARASITAEMIA AND TEMPERATURE OF M. RHESUS # MS 23



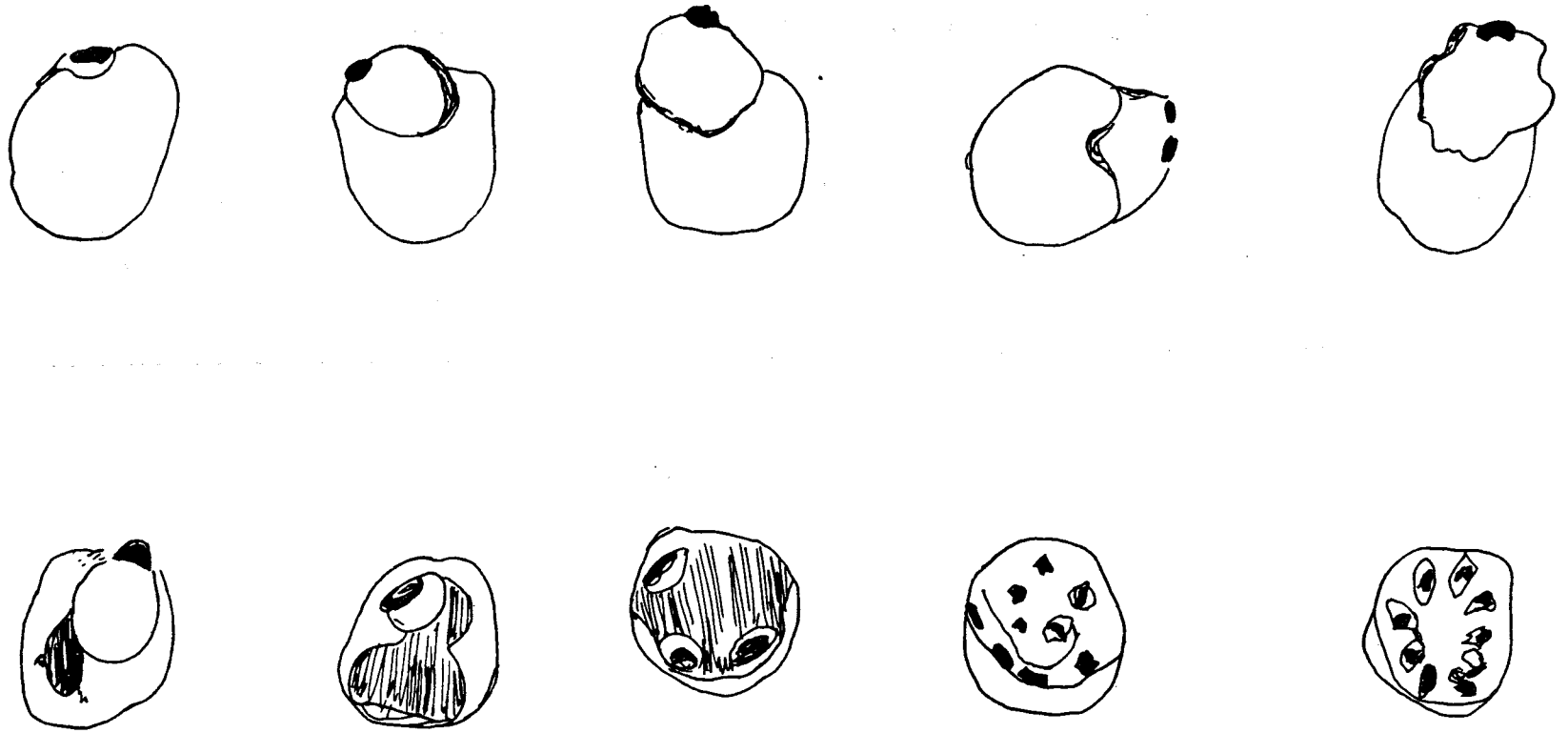


FIGURE 2.

DERELOPMENT OF ACCOLE' FORMS OF THAI ISOLATE OF SIMIAN PLASMODIUM (P. INUI ?)