



observed if only 100 cells are examined in making the differential count. However, by thorough search, I have been able to find them in slides from all cases of infectious mononucleosis which I have studied.

The nature and cause of these fenestrations remain to be determined.

8315 C

Phagocytosis of Malaria Parasites by the Neutrophil Leukocytes of the Marrow.*

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It has long been known that malaria plasmodia or their disintegration products must be phagocytized by the neutrophil cells, because pigment granules are frequently seen in the neutrophils in smears from the blood. However, I have never seen, and have been unable to find a record of anyone else who has seen, intact or only partially digested malaria parasites within neutrophil cells in the blood.

The development of the sternal puncture technic for obtaining human bone marrow during life¹ made possible the study of marrow smears in malaria. Examination of these smears revealed not only a higher percentage of the red cells invaded but the presence in the neutrophil leukocytes of malaria parasites in all stages of digestion, from the intact organism to the residual collection of pigment

* Slides and illustrations showing this phenomenon were demonstrated in the scientific exhibit at the 85th annual session of the American Medical Association in Cleveland, June, 1934.

¹ Young, R. H., and Osgood, E. E., *Arch. Int. Med.*, 1935, **55**, 186.

granules. Most of the phagocytizing leukocytes were staff cells but phagocytosis was observed also in segmented neutrophils and neutrophil metamyelocytes. Examination of blood smears made at about the same time that the marrow was taken revealed no evidences of phagocytosis of malaria parasites except the occasional presence of pigment granules in the neutrophils.

Such phagocytosis has been found in all sternal marrows from the 5 cases of inoculation tertian malaria which have so far been available for study. It seems reasonable to believe that this phagocytosis will be found to occur in naturally occurring tertian malaria and in the other forms of malaria.

8316 P

Structure of Colored Compound Formed in the Sullivan Reaction for Guanidine.

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Sullivan¹ found that when guanidine is heated with 1.2 naphthoquinone-4-sodium sulphonate and alkali a brown colored solution is formed which on acidification with concentrated HCl and concentrated HNO₃ gives a striking red complex while all other compounds tested, amino acids, amines, etc., go to yellow. Even amino guanidine and methyl guanidine are yellow. The formation of the red compound in the presence of HCl and HNO₃ was utilized as a test with a high degree of specificity for free guanidine.

In order to determine the structure of the colored compound formed, one gram of guanidine hydrochloride was dissolved in 10 cc. of water and to this was added 4 gm. of the naphthoquinone in 25 cc. of water, with a little of the quinone still in suspension. The well stirred mixture was made definitely alkaline with 10 cc. of 5N NaOH and the solution was brought to boiling on a water bath, then quickly cooled to 10-15°C. and acidified with 15 cc. of concentrated HCl followed by 15 cc. of concentrated HNO₃. The heavy red precipitate was centrifuged and washed free of acid by water. It was then dried in a desiccator and in an oven at 80°C. Without any attempt to obtain maximum yields the weight of the

¹ Sullivan, M. X., *PROC. SOC. EXP. BIOL. AND MED.*, 1935, **33**, 106.