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.

M. X. SULLIVAN AND W. C. HESS.

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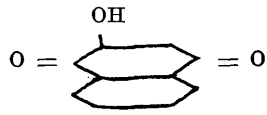
Sullivan[1] found that when guanidine is heated with 1.2 naphthoquinone-4-sodium sulphonate and alkali a brown colored solution is formed which on acidification with concentrated HCl and concentrated HNO_3 gives a striking red complex while all other compounds tested, amino acids, amines, etc., go to yellow. Even amino guanidine and methyl guanidine are yellow. The formation of the red compound in the presence of HCl and HNO_3 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 HNO_3. 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

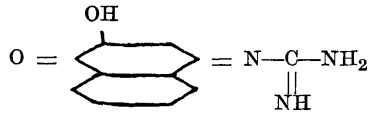
1 Sullivan, M. X., PROC. SOC. EXP. BIOL. AND MED., 1935, **33**, 106.

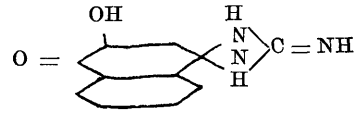
material purified for analysis was 1.8 gm. or 80% of the theoretical yield. The compound was little soluble in cold water, slightly soluble in alcohol and rather insoluble in acetone and ether. It dissolves in dilute NaOH with a strong red color. The M.P. on quick heating was 242-245°C. with decomposition. The nitrogen content was 19.35%. The same decomposition point obtained whether the precipitant was concentrated HCl, concentrated HNO_3, or mixtures of these, and mixed melting points of these precipitates showed no change.

On acid hydrolysis, 20% HCl or better alcohol H_2SO_4, 10% by weight of concentrated H_2SO_4 in 95% alcohol, the products obtained without attempt at optimum hydrolysis and fractionation of products were hydroxynaphthoquinone

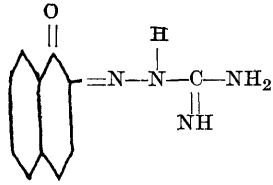


M.P. 187-88°C. in 74% yield of the theoretical and guanidine in 42% yield. To give these products the beta naphthoquinone guanidine complex must be: (A) or (B)





Analogous anilidonaphthoquinones were early shown by Zincke[2] and Liebermann[3] to yield hydroxynaphthoquinone on hydrolysis while as shown by Thiele and Barlow[4] compounds of the type



would yield alpha naphthol on hydrolysis. We have made the guanidine complex corresponding to Thiele and Barlow's compound. Its melting point is 265-267°C. with decomposition. Its nitrogen content is 21.19% and on acid hydrolysis it yielded more

[2] Zincke, Th., *Ber. Chem. Ges.*, 1881, **14**, 1493.

[3] Liebermann, C., *Ber. Chem. Ges.*, 1881, **14**, 1664.

[4] Thiele, J., and Barlow, W., *Ann. der Chem.*, 1898, **302**, 311.

or less alpha naphthol. The reaction product of 1.2 naphthoquinone-4-sodium sulphonate and guanidine as made in the Sullivan guanidine reaction, with a nitrogen content of 19.35%, a decomposition point of 242-245°C. and yielding hydroxynaphthoquinone on hydrolysis is explainable on the basis of formula (A) or (B).

8317 C

The Effect of Hypophysectomy upon Mammary Gland Development and Function in the Guinea Pig.*

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Studies on mammary gland development and lactation during the past few years have indicated that the ovarian hormones are responsible for the proliferation of the glands while the lactogenic hormone of the anterior pituitary is concerned with the initiation and maintenance of milk secretion. However, the possibility of a direct action of the anterior pituitary, as at least a contributing factor in mammary development, cannot be disregarded and obviously requires investigations on the character of development in hypophysectomized animals. Asdell and Seidenstein[1] have reported that hypophysectomized rabbits treated with oestrone and progesterone show mammary development comparable to that obtained in the intact animal. In addition to the question of a direct influence of the hypophysis on mammary growth there are uncertainties in regard to the necessity of the hypophysis for the initiation and maintenance of lactation.[2]

Hypophysectomy has been carried out in the guinea pig by a parapharyngeal approach. The operation is well tolerated, operative and early post-operative mortality being low, but deaths, probably due to hypoglycemic crises, are frequent during the first week. This has been successfully combatted to some extent by the routine administration of glucose during the first 10 days after operation.

* Aided by a grant from the National Research Council, Committee for Research in Problems of Sex. Grant administered by Dr. Edgar Allen. Also aided by a grant from the Anna Fuller Foundation.

1 Asdell, S. A., and Seidenstein, H. R., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 931.

2 Nelson, W. O., *Endocrinology*, 1935, **19**, 187.