

changes to a minimum, as well as when he was up and moderately active. The afternoon tide, which seems to be present in most normal subjects,⁸ was lacking.

The morning tide observed was almost certainly not produced by the secretion of hydrochloric acid by the stomach, nor was it connected with the ingestion of a meal. The experiments also seem to show that it was not caused by respiratory adjustment to waking conditions. It is possible that in this subject there is an unusual persistence of the "habit" alkali-acid rhythm implied by the work of Muschat⁹ and others. It is known that the rhythm sometimes persists when the stimulus to gastric secretion is absent, and here it may have persisted when acid secretion by the stomach had wholly ceased. Whether this explanation is or is not adequate, such a case as this, where an absence of hydrochloric acid is clearly demonstrated in a patient who shows a typical alkaline tide, makes necessary a somewhat conservative attitude towards the clinical interpretation of alkaline tide studies.

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Effect of Metals Purified by Electrolytic Deposition on Hemoglobin Regeneration in Anaemic White Rat.

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Recent work by Hart, Steenbock and others¹ and Myers and Beard² has given rise to opposing results as to the value of metals other than copper in the regeneration of hemoglobin in the anaemic white rat. The suggestion has been made³ that these differing results were due to the fact that the work was carried out in 2 rather widely separated localities. It has seemed to us that the publication of our results obtained in a third and entirely different section of the country might be of value as bearing on this point.

⁸ Hubbard, R. S., Munford, S. A., and Allen, E. G., *Am. J. Physiol.*, 1924, lxxviii, 149.

⁹ Muschat, M., *J. Clin. Invest.*, 1926, ii, 245.

¹ Waddell, J., Steenbock, H., and Hart, E. B., *J. Biol. Chem.*, 1929, lxxxiv, 115.

² Myers, V. C., and Beard, H. H., *J. Am. Med. Assn.*, 1929, xciii, 1210.

³ Discussion by Drs. Hubbard, Steenbock and Myers, *J. Am. Med. Assn.*, 1929, xciii, 1212.

The rats used were from a local laboratory strain, originally a Wistar Institute stock. The milk used came entirely from one cow, was milked in an enamelled vessel and brought to the laboratory in glass bottles, with the result that there was no contact with metal previous to feeding. This precaution was found to be necessary since neither raw nor pasteurized milk bought on the open market sufficed to produce an anaemia in the white rat, although it comprised the sole diet of the animals for a period of 6 months.

Several attempts were made to obtain iron, free from traces of other metals, but electrolytic deposition was the only method producing a sample of iron which does not allow a regeneration of hemoglobin in anaemic white rats. Whether or not it may prolong the life of the animal,⁴ we are not at this time prepared to state. The method used for the electrolytic deposition of iron was that of Classen and v. Reis.⁵ Copper was prepared electrolytically by the method of H. Sand,^{6,7} and cobalt by that of Denso.⁸ The preparation of manganese electrolytically in the form of the oxide, free from traces of copper, by the method of Engel,⁹ was unsuccessful and, therefore, the manganese solution used in our experiments was prepared from manganese sulfate (C. P. Baker's) by subjecting it to the usual scheme of qualitative analysis, and isolating the manganese as the chloride. The acid used to remove the metals from the platinum electrodes was Mallinckrodt Reagent Quality. Iron

TABLE I.

No. of rats	Metal fed	Hemoglobin (gm. per 100 cc.)			
		6/5	6/13	6/27	7/16
9	Fe.	5.5-8.5 Av. 6.6	5.0-7.0 Av. 6.4	5.0-7.5 Av. 6.2	
8	Fe.+Mn.	4.0-7.0 Av. 5.0	5.0-5.5 Av. 5.2	4.25-6.0* Av. 5.2	7.0-12.0 Av. 9.7
8	Fe.+Co.	3.0-4.5 Av. 3.6		All readings = 3.5*	6.0-11.5 Av. 7.6
7	Fe.+Cu.	4.25-6.75 Av. 5.2	8.0-11.5 Av. 9.7	8.0-15.5 Av. 12.0	

* Changed to Fe.+Cu. on the day following this reading.

⁴ Goerner, A., *J. Lab. Clin. Med.*, 1929, xv, 119.

⁵ Classen, A., and v. Reis., *Ber.*, 1881, xiv, 1622.

⁶ Sand, H. J., *J. Chem. Soc.*, 1907, xci, 373. (Quantitative analysis by Electrolysis, A. Classen-Hall. New York, 1913.)

⁷ Sand, H. J. S., *Z. Elektrochem.*, 1907, xiii, 326. (Quoted by A. Classen. See 6.)

⁸ Denso, P., *Z. Elektrochem.*, 1903, ix, 469. (Quoted by A. Classen. See 6.)

⁹ Engel, H., *Z. Elektrochem.*, 1895, ii, 413, 1896, iii, 286, 305. (Quoted by A. Classen. See 6.)

was fed as the nitrate in amounts of 0.5 mg. of metal per rat per day; copper, cobalt and manganese as the chlorides in amounts of 0.1 mg. of metal per rat per day.

Hemoglobin determinations were made by the method of Newcomer.

The results of the experiments are briefly summarized in Table I.

It is evident, therefore, that under the conditions of our experiments *pure* iron, fed alone, does not cause a regeneration of hemoglobin in anaemic white rats. Copper is effective in the regeneration when fed together with iron, while manganese and cobalt fed under the same conditions are without effect.

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Effect of Placental Extracts on Ovarian Stimulating Properties of Anterior Hypophysis.*

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The interrelationships between the hypophysis and the ovary have been studied extensively. Changes in the ovary following the administration of anterior lobe substance and extracts have been described by Goetsch,¹ Evans,² Zondex and Ascheim,³ and others. Erdheim and Stumme⁴ called attention to changes in the hypophysis during pregnancy. Zondex and Ascheim have demonstrated, in the urine of pregnant women, the presence of a hormone which has all the ovarian growth properties of the anterior hypophysis, and have utilized this in their test for pregnancy. Fels⁵ found the same hormone in the blood of pregnant women. Recently Engle and Smith⁶ have demonstrated that the amount of ovarian stimulating substance in the hypophysis of the guinea pig varied during the sexual cycle, and was much diminished during the time the vagina

* Part of the animals used in these experiments were drawn from the colony supported by the Commonwealth Fund.

¹ Goetsch, Emil, *Johns Hopkins Hosp. Bull.*, 1916, xxvii, 29.

² Evans, Herbert M., *Harvey Lectures*, 1924, xix, 212.

³ Zondex, B., and Ascheim, S., *Arch. f. Gyn.*, 1927, cxxx, 1.

⁴ Erdheim, J., and Stumme, E., *Beitg. z. Path. Anat. u. z. Allg. Path.*, 1909, xli, 1.

⁵ Fels, Erich, *Wien. Klin. Woch.*, 1928, xli, 1225.

⁶ Smith, P. E., and Engle, E. T., *Anat. Rec.*, 1929, xliii, 239.