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Effect of Kidney on Blood Regeneration in Pernicious Anemia.

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The experiments of Whipple and Robscheit-Robbins[1] have given rise to an extensive knowledge of the effects of various articles of diet on the regeneration of blood in dogs rendered chronically anemic by repeated bleeding. The most important application of this fundamental work to the therapy of anemia was made by Minot and Murphy,[2] who reported extraordinarily good results from the administration of liver in pernicious anemia. These results have been abundantly confirmed. The use of liver in the diet has become so general that it is frequently difficult for patients to obtain it, so much so that it is necessary to investigate the therapeutic effects of other foods which Whipple and Robscheit-Robbins have found to be effective, particularly kidney and apricots, both of which caused active regeneration in the anemic dogs.

In this paper are reported observations on the course of blood regeneration in two cases of pernicious anemia who were fed diets containing 250 gm. of kidney daily. The diets contained no red muscle, no foods other than kidney found to be of high value in blood regeneration by Whipple and Robscheit-Robbins, except small amounts of apricots, prunes, and other fruits, given as desserts.

Patient No. 11028, a man aged 68 years, was admitted to the Strong Memorial Hospital for symptoms of weakness, anorexia, sore tongue, loss of weight, and paraesthesias in hands and feet, of 7 months duration. On examination the principal findings were, yellowish pallor, red tongue with smooth borders, moderate smooth sclerosis of palpable vessels. Vibratory sense unimpaired. Reflexes all in order. There was achylia gastrica, urobilinuria, and a slight increase in blood plasma pigment—Van den Bergh test 1.8 units. The hemoglobin was 45% Sahli (100% = 14.5 gm. Hgb.

per 100 cc.). Red corpuscles 1.42 millions per cu. mm. Leucocytes 4,100. Blood smear showed anisocytosis, poikilocytosis, some diffuse and punctate basophilia. Reticulocytes 1.4%.

Diagnosis: Pernicious anemia. The course of events after administration of the kidney diet, which was taken well for 17 days, is shown in Fig. 1. In 17 days the red count rose from 1.4 to 2.6 millions, the hemoglobin from 45 to 74%. The percentage of reticulocytes, which was slightly elevated at the start, varies between 2 and 5% between the 7th and 16th days. On the 17th day liver was given instead of kidney and on the 6th day thereafter the hemoglobin had risen from 74 to 80%, and the red count from 2.6 to 2.8 millions. The leucocytes count rose from 4100 to 7200. All symptoms were much improved.

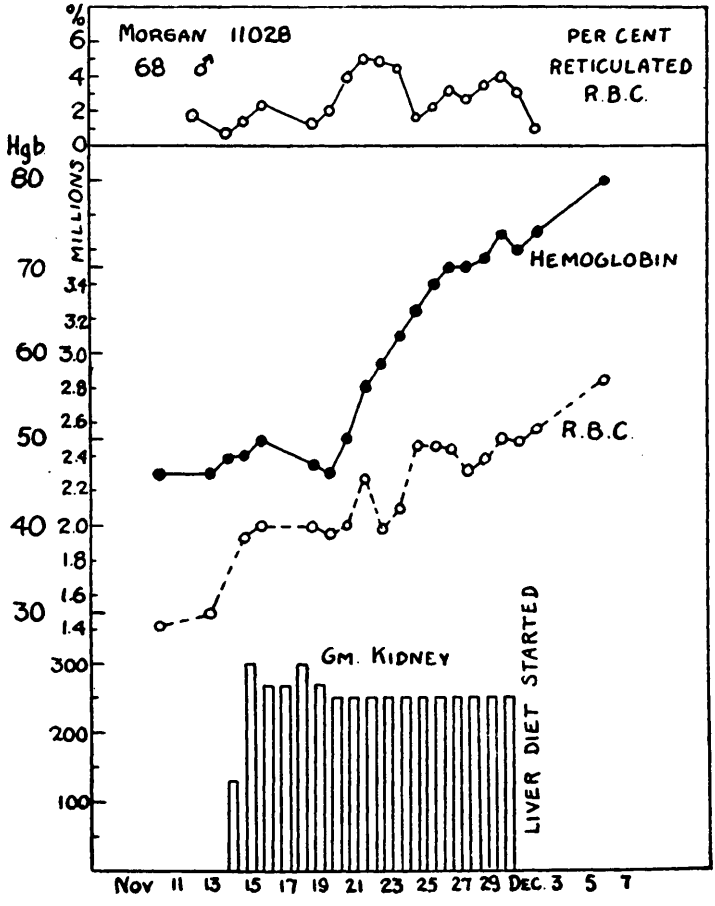

FIG. 1.

Patient No. 10861, a woman of 71 years, was admitted to the Strong Memorial Hospital complaining of vague gastro-intestinal symptoms of 2 years duration, numbness of hands and feet of 8 months duration, soreness of tongue, 4 to 5 months duration, and great weakness. Examination revealed pallor, emaciation, senile keratosis of skin; arcus senilis, retinal arteriolar-sclerosis, early cataracts; atrophy of marginal papillae of tongue; systolic bruits over both apex and base of heart, peripheral arteriosclerosis, B. P. 160 mm. systolic, 70 mm. diastolic; palpable liver; moderate pitting edema of extremities; neurological—considerable ataxia of gait and station and loss of postural sense, impairment of vibratory sense; ankle jerks absent, abdominal reflexes not obtained, plantar reflexes of flexor type. The blood on admission: Hemoglobin 65%

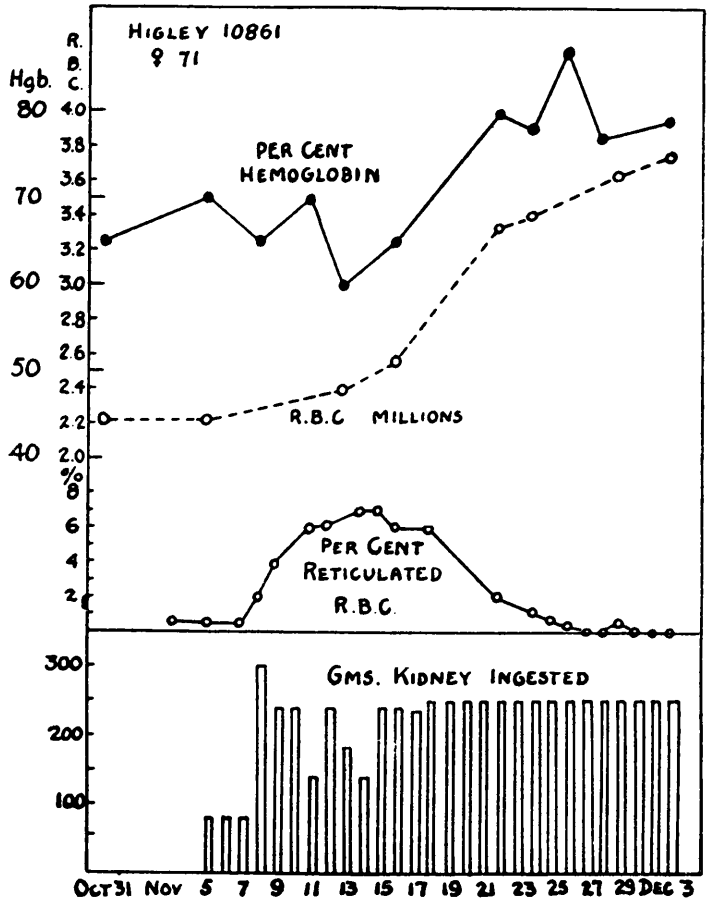

FIG. 2.

Sahli (100 = 14.5 gm. per 100 cc.). R. B. C. 2.24 million, W. B. C. 5,800. Smear showed anisocytosis with many macrocytes, considerable poikilocytosis, no obvious reduction of platelets. The plasma bilirubin was not increased above normal. Reticulocytes 0.7%. The gastric contents showed no free hydrochloric acid.

Diagnosis: Pernicious anemia, with subacute combined degeneration of spinal cord and moderate anemia, with cord symptoms progressing more rapidly than the anemia. The course under treatment with kidney diet is best shown in Fig. 2. The kidney was given for a period of 27 days, during which time the red cell count rose from 2.2 to 3.8 millions, the hemoglobin from 65 to 79%. The leucocytes increased from 5,800 to 10,000 per cu. mm. The percentage of reticulocytes began to increase on the 3rd day and reached a maximum of 7% on the 7th and 8th days, reaching normal again of the 17th day of the diet. As the reticulated cell count fell the total red cell count rose. During the course of observation the spinal cord symptoms grew worse, if anything, though the general condition of the patient improved.

Two patients with pernicious anemia had remissions induced by giving a diet with 250 gm. of kidney daily. The relative values of kidney and liver feeding can be determined only on comparison of a long series of cases.

[1] Whipple, G. H., and Robscheit-Robbins, F. S., *Am. J. Physiol.*, 1925, lxxii, 395, 408, 419, 431; 1927, lxxix, 260, 271.

[2] Minot, Geo., and Murphy, Wm. P., *J. Am. Med. Assn.*, 1926, lxxxvii, 47; *Bost. Med. and Surg. J.*, 1926, cxcv, 410.

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Influence of Epinephrine on Carbohydrate Metabolism of Fasting Rats.

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A brief report[1] has been made concerning the influence of epinephrine injections on the utilization of ingested glucose in rats, and of other experiments which dealt with the metabolic changes brought about by epinephrine in post-absorptive rats, rich in glycogen. In both the sugar fed and the post-absorptive rat, there was a diminution in muscle glycogen, which indicates that epinephrine has also