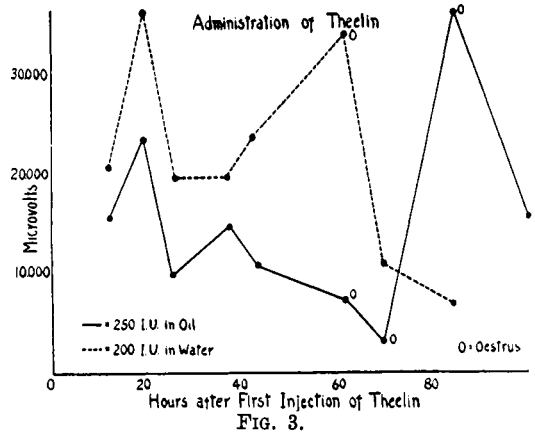

FIG. 3.

in oil is given the animals remain in heat for a longer time. These rats again show the rise about 19 hours after theelin injection but, in 8 out of 9 rats thus far studied, there is no second rise on the third day when they come into heat. The readings remain low until a few hours before postoestrus sets in when the expected rise in potential occurs. Further tests of these reactions are being made to ascertain if electric potentials are constant enough to furnish a unit of measurement for estrogenic substances.

Summary. In normal rats the difference in electrical potential between the symphysis pubis and the vagina is much greater at oestrus than during the rest of the cycle. Readings from castrate animals form a patternless type of curve. Administration of theelin causes two rises in potential: nineteen hours after the first injection, and just before the animal passes out of oestrus.

8734 P

Basal Metabolism in Experimental Anemias.

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Basal metabolic changes have been observed in various types of anemia and in different stages of the same anemia. A number of theories have been advanced to explain this phenomenon, among which may be mentioned the hematopoietic activity[1] and the presence of immature cells in the blood.[2] While immature erythrocytes

1 Jeney, A., *J. Exp. Med.*, 1927, **46**, 689.

2 Alt, H. L., *Arch. Int. Med.*, 1929, **43**, 488.

do consume more oxygen than normal red blood cells,[3] one can hardly expect them to appreciably influence the total metabolism since they constitute such a small fraction of the body mass. Baldridge and his associates[4–7] seem to have shown, in their recent investigation, a reciprocal relationship between the oxygen consumption and the nitrogen balance in various blood diseases but they, too, do not doubt the part sometimes played by the circulating reticulocytes in raising the respiratory metabolism.[4] The present study is planned to inquire into this particular question and to ascertain the behavior of the gaseous exchange in anemias produced by different methods.

Young male adult albino rats of approximately the same age and weight (about 300 gm.) were used. Their normal oxygen consumption in the post-absorptive state was determined by repeated estimations according to the method of Davis and van Dyke.[8] Anemia was produced in one group of the animals by intraperitoneal injection of phenylhydrazine hydrochloride, 10 mg. per 100 gm. of body weight. In another group the rats were bled from the tail, about 2 cc. daily. Throughout the experimental period the following data were collected by standard methods: Body weight, oxygen consumption, body temperature, red and white blood cell counts, hemoglobin content, hematocrit reading, morphology of stained blood-smear, differential count and reticulocyte count. If the animal survived through the experiment it was sacrificed and autopsied.

All animals lost some weight in the course of the experiment, usually not exceeding 40 gm. The picture of the bone marrow is essentially the same in the 2 types of anemia, namely, marked hyperplasia involving both myelocytic and erythroblastic elements and nearly always some megaloblastic blood formation. In the first group only 4 animals were successfully studied, the majority succumbed too early to permit observation for a sufficiently long period. In them the phenylhydrazine produced a prompt drop of the red cell count and hemoglobin concentration. The reticulocyte count rose steadily, reached its maximum (varying between 45 and 50%) in from 5 to 8 days, and after being maintained at that level for about 2 days, declined slowly. Immediately following the injection of the drug the oxygen consumption showed a rise to

[3] Harrop, G. A., *Arch. Int. Med.*, 1919, **28**, 745.

[4] Baldridge, C. W., and Barer, A., *J. Clin. Invest.*, 1931, **10**, 529.

[5] Baldridge, C. W., and Barer, A., *Arch. Int. Med.*, 1933, **51**, 589.

[6] Barer, A., Paul, W. D., and Baldridge, C. W., *J. Clin. Invest.*, 1934, **13**, 15.

[7] Baldridge, C. W., *Arch. Int. Med.*, 1934, **54**, 517.

[8] Davis, J. E., and van Dyke, H. B., *J. Biol. Chem.*, 1932, **95**, 73.

from 10 to 30% above the control level but this rise only lasted for from 1 to 4 days. The peak of the reticulocyte curve lagged from 4 to 8 days behind the rise of metabolism. Leucocytosis and increase of the polymorphonuclear neutrophils accompanied the anemia.

In the second group in which the blood was depleted by bleeding, the red blood cell count and hemoglobin concentration dropped more slowly than in the preceding group but eventually reached just as low a level and remained there for a long time, as long as the bleeding was continued. A reticulocytosis of about 40% also took place in the course of from 10 to 12 days. The oxygen consumption, on the other hand, showed no significant change throughout the experimental period, nor after the discontinuation of bleeding. No marked leucocytosis occurred in this group.

In these experiments strict parallelism did not exist between the oxygen consumption and the reticulocyte count. In the phenylhydrazine anemia the increase in metabolism was fleeting in character and was manifest before the reticulocyte response reached its climax while in the post-hemorrhagic anemia the energy exchange showed no significant deviation from normal, during or after reticulocytosis. In the light of Baldridge's work the explanation of this difference seems evident. That is, in phenylhydrazine anemia there is an enormous destruction of the red blood cells to account for the transient increase in metabolism. In both conditions active hematopoiesis and high reticulocytosis are present but these changes *per se* do not seem to result in any marked alteration of the respiratory metabolism. This clearly shows that the metabolism of the immature blood cells contributes very little to the total oxygen consumption and that the basal metabolic changes in various blood diseases are dependent upon some other factor, such as increase of nitrogen catabolism as a result of blood cell destruction.

8735 C

Experimental Virus Infections in Chinese Hamster. II. Susceptibility to Street Rabies Virus.

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It has been noted[1] that the Chinese hamster is susceptible to fixed rabies virus, but its susceptibility to street rabies virus still remains to

[1] Yen, A. C. H., PROC. SOC. EXP., BIOL. AND MED., 1936, **34**, 315.