

and on two occasions 16° below. Notwithstanding this low temperature the food was still eaten by the woodchucks.

No food was supplied from Jan. 20 till Feb. 14 when the animals were again examined in the burrows. On that day their tracks in the snow were abundant. Six were found to be in a semitorpid condition, but they did not show the deep narcosis of true hibernation; the others were very active and combative, one having a rectal temperature of 99° F. Although no food had been placed in the inclosure for three weeks, it is still possible that they had some stored in their burrows, or that they ate the straw.

The six which showed some degree of torpor were removed to the laboratory, kept overnight outside the building in a large box amongst straw, and the next day, under ether anesthesia, a small lesion was made in the spinal cord of each. On the day following they were completely awake and active, and remained so until killed at various intervals after the operation. Food was supplied to these as well as to those left behind in the burrows from Feb. 14 onwards; they were inspected at short intervals from that date till the end of March and never showed any tendency to hibernate. The rectal temperature ranged from about 95° F. to 101° F.

These animals were not artificially protected from the weather in any way; the only circumstance in which their condition differed from that of their fellows in the open fields was that food was furnished them. The behavior of this colony would seem to point to the fact, therefore, that the absence of food supply is an important factor in determining the onset of hibernation.

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A rapid method of producing a hemolytic serum.

By **FREDERICK P. GAY** and **J. G. FITZGERALD.**

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Fornet and Müller¹ were first to suggest the intensive method of immunizing animals by giving large doses of serum for pro-

¹ Fornet and Müller, *Zeitschrift für biologische Technik und Methodik*, Strassburg, 1908, vol. 1, p. 201.

ducing precipitins intra-peritoneally on successive days. Such a method apparently gave rise to a potent precipitating serum and they claim equally successful results in producing hemolysins. These results as regards hemolysins were not confirmed in a later communication by Bonhoff and Tsuzuki.¹

We have found that one can obtain uniformly a sufficiently potent hemolytic serum for fixation tests by immunizing rabbits with washed sheep blood in a dose of one to two cubic centimeters administered intravenously on three successive days. The hemolytic titer of such a serum *four days after the third injection* is usually 1 to 2,000. In other words, it is possible to produce a thoroughly reliable hemolytic serum in one week by this method.

Further details of this intensive method of immunizing to produce hemolytic sera and also its use in producing precipitins, bacteriolysins, agglutinins, and antitoxins will form the basis of a more extensive communication to be published in the Pathological series of the University of California Publications.

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Note on the effect of the internal secretions upon the secretion of epinephrin.

By **ISAAC OTT** and **JOHN C. SCOTT**.

One² of us was the first to show that the adrenal secretion relaxed and inhibited the rhythmic contractions of the intestine. Hoskins has shown that a dilution of 1-400 millions of epinephrin inhibits the rhythmic contractions. It thus becomes the most sensitive test for the presence of epinephrin. We tested its presence by the Magnus method. We injected a few grains of the filtered solution of the different glands into the jugular of the narcotized cat, and drew off, as Cannon has done, some blood from the vena cava above the openings of the adrenal veins, and defibrinated it. Normal blood defibrinated was then applied to a segment of the intestine of a narcotized rabbit and its rhythmic movements recorded. Then the blood, after the injection of the glandular filtrate, was applied to the same intestine and its move-

¹ Bonhoff and Tsuzuki, *Zeitschrift für Immunitätsforschung*, IV, page 180.

² *Medical Bulletin*, 1897, p. 376.