figures for the percentage of diodrast coming through in plasma filtrates of normal humans and dogs were 84.6 and 84.7%, respectively. More recent findings place these averages at 86.9% for humans and 85.9% for dogs, with average deviations of 1.7% and 1.4% respectively. This figure can be established for each subject when the highest accuracy is desired.

CALCULATIONS. For plasma filtrate,

$$\text{cc 0.0005 N thiosulphate} \times \frac{10.6}{1000} \times \text{dilution factor} \times \frac{100}{\%\ \text{coming through}} = \text{mg iodine per 100 cc plasma.}$$

Example, using 3 cc of plasma filtrate,

$$0.530 \times \frac{10.6}{1000} \times \frac{1000}{3} \times \frac{100}{86.9} = 2.15 \text{ mg iodine per 100 cc plasma.}$$

For urine,

(1) using 0.0005 N thiosulphate,

$$\text{cc thiosulphate} \times \frac{10.6}{1000} \times \text{dilution factor} \times 100 = \text{mg iodine per 100 cc urine.}$$

(2) using 0.0025 N thiosulphate,

$$\text{cc thiosulphate} \times \frac{53}{1000} \times \text{dilution factor} \times 100 = \text{mg iodine per 100 cc urine.}$$

11708

Degree of Ketosis During Fasting.

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Ketosis during extended fasting has heretofore been measured by the ketonuria. Because the acetone bodies are threshold substances the ketonuria does not necessarily give a true picture of the degree of ketosis which exists. Furthermore the only record of even the ketonuria in fasts of more than 3 or 4 days' duration were obtained prior to the development of modern methods for determining acetone bodies. We have examined the degree of ketosis during fasting in a human subject and in a group of rats through measurements twice daily of the level of acetone bodies in the blood. In the rats arterial blood and in the human subject venous blood was used for this purpose. Due to the utilization of acetone bodies by the tissues during a ketosis[1] the figures for acetone bodies for venous blood

would be slightly lower than for arterial blood. The method of Barnes and Wick[2] was used for the determination of acetone bodies. Forty adult female rats weighing an average of 175 g each were used for the rat experiment, being fasted from the stock diet.[3] Two rats were sacrificed every 12 hours and the averages of the results obtained on these pairs of samples are reported here. The human subject was a female 52 years of age, 177 cm in height and weighing 121 kg. Except for the marked obesity she was in no way abnormal. She had been taking a general diet prior to fasting.

Our results are charted in Fig. 1. During a period of 48 hours in the rat and 85 hours in the human subject after the beginning of fasting the concentration of acetone bodies in the blood rose to reach a level which was then maintained with some fluctuation until the end of the 10-day fast. The variability of the blood acetone body level during fasting appears to be greater in the rat but it must be remembered that the rat data was obtained from a group while the human data was obtained from a single subject. The rate of increase in the degree of ketosis at the onset of fasting is probably determined by the extent of the stored carbohydrate and protein readily available for catabolism during this period.[3, 4] The main-

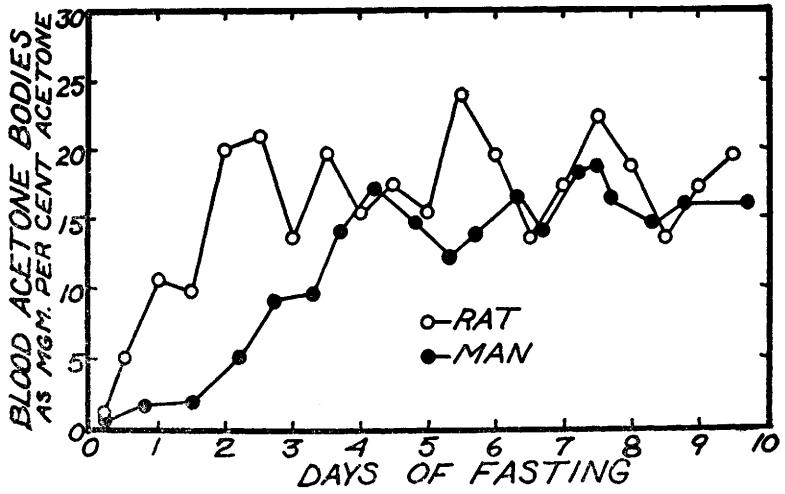

FIG. 1.

Blood Acetone Body Concentration During Fasting in Man and the Rat.

[1] Barnes, R. H., Drury, D. R., Greeley, P. O., and Wick, A. N., *Am. J. Physiol.*, 1940, **130**, 144.

[2] Barnes, R. H., and Wick, A. N., *J. Biol. Chem.*, 1939, **131**, 413.

[3] Wick, A. N., and MacKay, E. M., *Am. J. Physiol.*, 1940, **130**, 332.

[4] MacKay, E. M., Carnes, H. O., and Wick, A. N., PROC. SOC. EXP. BIOL. AND MED., 1939, **41**, 40.

tenance of the ketosis at a more or less constant level after this period is probably due to the availability for catabolism of a limited but relatively constant source of carbohydrate from tissue protein and the glycerol from the fat which is burned.

Summary. During the first 2-4 days of fasting the degree of ketosis in the human and the rat as measured by the blood acetone body concentration gradually increased to a level of 15-20 mg % (acetone) which then tended to be maintained during the rest of the 10-day fasting period.

11709

Development of Influenzal Complement-Fixing Antigen and Antibody in Mice.*

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The lungs of mice infected with the virus of epidemic influenza contain a soluble complement-fixing antigen which is separable from the virus.[1, 2] The purpose of the work here reported was to investigate the conditions under which this antigen and its corresponding antibody are formed.

Mice were inoculated with the mouse passage strain PR8 of epidemic influenza virus in dilutions from 10^{-2} to 10^{-8} of lung. At different intervals of time from 1 to 10 days, 6 to 8 mice receiving each of the dilutions were killed by bleeding from the heart under chloroform anesthesia. The complement-fixing antigen was measured by titration of a saline suspension of the ground lung material against a constant dilution of 1:20 of a pool of human convalescent serum according to the complement-fixation method previously described.[3]

The results are recorded in the accompanying table. One day after inoculation none of the mice showed macroscopically visible

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1 Smith, W., *Lancet*, 1936, **2**, 1256.

2 Hoyle, L., and Fairbrother, R. W., *J. Hygiene*, 1937, **37**, 512.

3 Eaton, M. D., and Rickard, E. R., *Am. J. Hygiene*, 1940, in press.