were remarkably constant. For instance in normal muscle the extreme variations in 24 consecutive determinations were from 2.3 to 3.1 cu. mm. per dry mg. per hour. These correspond to values obtained in both tissues by the method of analyzing arterial and venous blood simultaneously in the intact organ. The respiratory quotients were all within physiological limits and indicated that various mixtures of foodstuffs were oxidized. In 11 triplicate determinations the highest figure was 0.911. This cannot be reconciled with the widespread idea that only carbohydrate can be oxidized by muscle.

(2a) The average respiratory quotients were as follows:

Kidney—Normal without foodstuff	0.812
With glucose	0.873
Depancreatized, without foodstuff	0.694
With glucose	0.684
With lactate	0.734
Muscle—Normal with glucose	0.874
Depancreatized, with glucose	0.728

These figures show that isolated diabetic tissue can oxidize only a small amount of carbohydrate.

(2b) Diabetic tissue retains the power of splitting carbohydrate into lactic acid. Therefore it is not a failure to glycolize which depresses the oxidation of carbohydrate in diabetes.

3996

Effect of Thyroxin on Formation of Sugar in Surviving Liver of Winter Frog.

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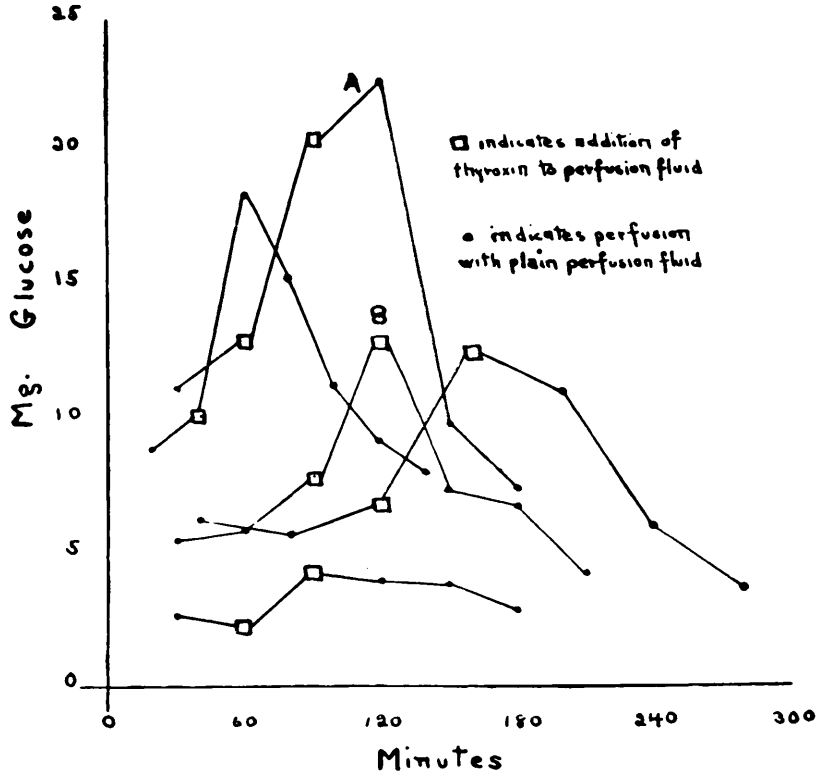
This study was made upon the perfused liver of the bullfrog *(Rana catesbiana)*. It was found that in the isolated livers, whether excised or left *in situ,* thyroxin as a rule produced a slight fall in the amount of sugar given off into the perfusate, as against the amounts of sugar obtained during the preliminary control periods.

When the body of the frog was perfused with thyroxin through the systemic aorta there was a marked rise in the sugar of the perfusate draining from the hepatic vein. (Graph 1.) This increase lasted only a limited length of time and was then followed by a grad-



GRAPH 1.

Effect of thyroxin on the hepatic sugar of the perfused water frog. Dose of thyroxin approximately 1 mg., dilution 1:20,000-1:100,000. A represents perfusion of frog with renal vessels ligated. B represents perfusion of same frog after removal of the ligatures.

ual decline of the sugar concentration to the control level. The fall occurred in spite of prolonged perfusion with thyroxin. The same results were observed in a frog with the adrenals excluded from the circulation.

When the liver was tied off so that it could be perfused separately from the body, and the body perfusates, collected from the posterior vena cava, were passed through the isolated organ, there was a sharp and prolonged increase in the hepatic sugar. There was no further rise, however, as a result of perfusion with body perfusate which had thyroxin added to it before passing it through the body. In an experiment with 2 frogs which were cross-perfused, the fluid from the vena cava of the one frog emptying through a rubber tube connection into the liver of the other, there was a 22% rise in the

hepatic sugar. At the end of the experiment this liver was found to contain only 6.10 mg. of glycogen.

These results seem to point to the conclusion that the effect of thyroxin upon the carbohydrate of the liver is probably an indirect one. The manner in which this influence is brought about is not yet clear.

3997

Respiratory Anaphylaxis in Guinea Pig Due to Castor Bean Dust.*

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Last year we[1] demonstrated for the first time that normal guinea pigs, when exposed to an organic dust such as horse dander, could become sensitized through inhalation. Guinea pigs, thus sensitized, when again placed in contact with the same dust after a suitable incubation period, demonstrated unmistakable signs of anaphylaxis which we termed "respiratory anaphylaxis" and which we believed to be identical with bronchial asthma in the human being. This was offered as a method for studying asthma experimentally in the animal.

Recently, Figley and Elrod[2] reported the occurrence of a large number of cases of asthma resulting from the inhalation of castor bean dust "pomace" thrown into the air from the pipes of a castor oil factory. To determine whether pomace was an anaphylactogen and could be the cause of asthma, we proceeded to study the problem of pomace asthma in the guinea pig. The pomace came from the above castor oil factory.

Thirty-seven normal guinea pigs were placed for several hours in glass cages in which pomace was kept in circulation by currents of air. After an incubation period of about 3 weeks, 2 of these animals were given an intravenous injection of 0.5 cc. of a crystal clear alkaline extract of this pomace. Both animals showed definite anaphylaxis, one dying within a few minutes and demonstrating

* This work is being carried on under "The Crane Research Fund for the Study of Allergic Diseases in Children."

[1] Ratner, B., Jackson, H. C., and Gruehl, H. L., *Am. J. Dis. Child.*, 1927, xxxiv, 23.

[2] Figley, Karl D., and Elrod, Robert H., *J. Am. Med. Assn.*, 1928, xc, 79.