Francisco. However, the State Department of Agriculture of California (Serial Publication No. 109) uses thousands of pounds of thallium coated grain in rodent control work. In spite of careful supervision, several fatal cases[1] of thallium poisoning in man have already occurred, as well as some losses to domestic animals, according to press dispatches.

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## THE EXISTENCE OF AN EXTRA-PANCREATIC (OR CELLULAR) INSULIN IN THE DOG AFTER PANCREATECTOMY?

A RECENT article by Tuttle[1] offers a reinterpretation of some results published by the present writer in the paper entitled "The Utilization of Carbohydrate by Totally Depancreatized Dogs Receiving no Insulin."[2] While granting that the results in question undoubtedly show the utilization of large amounts of carbohydrate by such animals, Tuttle interprets this as being evidence for "the existence of an extra-pancreatic (or cellular) insulin in the dog after pancreatectomy."

I should like to point out that this hypothesis was considered in my paper, but rejected in favor of the "Overproduction Theory of Diabetes," for the following reasons:

(1) The animals did not survive indefinitely, as they do with insulin injections. Nor can the death of these animals be ascribed to the withdrawal of raw pancreas from their diet, as Tuttle suggests. Reference to a later paper by Hershey and the writer[3] will readily show the difference in the time periods involved and the entirely different pictures presented by these two syndromes.

(2) Dogs 1 and 14 (Tables I and IX), which according to the results obtained should have acquired a fairly adequate extra-pancreatic insulin supply, were as "diabetic" as ever when insulin injections were resumed and then discontinued for the second time.

But perhaps a greater objection to Tuttle's contentions is based upon what the writer believes to be a fundamental error in the logic employed. Tuttle's major premise is that "insulin is necessary for the oxidation of glucose." It must be pointed out, however, that this belief is largely based upon the supposedly fixed and peculiar nature of the D:N ratio and the respiratory quotient in the diabetic organism. Since the validity of these phenomena is the very thing which my results have disproven, Tuttle has, in effect, assumed as true the very thing he set out to prove.

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[1] A preliminary report of these cases appears in the *Journal of the American Medical Association* for March 26, 1932, page 1076.

[1] *New Eng. Jour. Med.*, 206: 8, Jan. 7, 1932.

[2] *Jour. of Nutrition*, iii: 99, Sept., 1930.

[3] *Am. Jour. of Physiol.*, 98: 74, Aug., 1931.

## THE MUSKRAT, A NEW HOST FOR PARAGONIMUS

DR. E. W. PRICE[1] has recently described four new species of trematodes from the muskrat, *Ondatra zibethica,* and in the same paper included a key to all the known trematodes of this animal, but the mammalian lung fluke, *Paragonimus,* was not listed. I pointed out in a recent paper[2] that I had been able to infect muskrats with *Paragonimus* in the laboratory, but that I had not found this parasite in a collection of 249 wild muskrats from Michigan, chiefly from the southeastern part of the state. Since that paper appeared, this parasite has been found in wild muskrats from two localities in western Michigan. During November, 1931, four out of 34 muskrat carcasses secured near Manistee for the use of the class in parasitology were found to be infected with *Paragonimus.* Later, two out of 19 carcasses from the same source and four out of 26 from Muskegon examined by me were infected. Three of them bore unusually heavy infections. Thus, during the fall of 1931, 79 muskrats were examined, of which 10 (12 per cent.) were infected.

In the same paper indicated above, I expressed an opinion that the mink is the normal definitive host of *Paragonimus* since a 17 per cent. infection was found in a collection of 563 carcasses of minks from Michigan and northern Ohio. *Paragonimus* was not found in 308 raccoons, 109 opossums, 22 weasels and one badger from the same region examined during the same period. Wallace[3] reported a 7 per cent. infection in 234 minks which he examined at fur farms in Minnesota.

The discovery of *Paragonimus* in such a high percentage of wild muskrats from a limited locality warrants the assumption that, under certain conditions, these animals serve as well as the mink in the capacity of definitive host.

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[1] E. W. Price, "Four New Species of Trematode Worms from the Muskrat, *Ondatra zibethica,* with a Key to the Trematode Parasites of the Muskrat," Proc. U. S. Nat. Mus., 79: art. 4, 1–13, 1931.

[2] D. J. Ameel, "More Data on the Lung Fluke, Paragonimus, in North America," SCIENCE, n. s., 74: 493–494, 1931.

[3] F. G. Wallace, "Lung Flukes of the Genus Paragonimus in American Mink," *Jour. Am. Vet. Med. Asso.*, 31: 225–234, 1931.