of any part of the pigment cell during the distribution or congregation of the pigment. The movement of the pigment as a whole or of the individual granules, whether going into or out of the branches of the cell, did not suggest to me that any part of the melanophore was acting in the capacity of a rubber bulb.

As the pigment moved out into the branches, some granules usually reached the extremities of the cell before others had little more than begun to move; and, as the process continued, the cell branches received more and more pigment. In this movement of the pigment, a few granules might move more rapidly than others for a time, only to be overtaken by those that were following. No one granule appeared to maintain a constant rate of movement. Similar movements were observed when the pigment moved out of the branches, some granules lingering for a time and then by more rapid movement overtaking others ahead. I have seen no evidence to support the statement by Mast[2] that pigment granules move on definite paths through the cytoplasm.

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PANCREATECTOMY—A WARNING[1]

THE nutritional condition of an animal when pancreatectomy is performed determines to a large extent the length of survival if no insulin is given. Chaikoff, Macleod, Markowitz and Simpson[2] have emphasized the longer survival of thin dogs than fat ones after this operation. The Allen treatment for human diabetes probably owes its success to the inanition of the patients.

In studies of the relation between other endocrine glands and the pancreas, animals frequently submit to one operation prior to the pancreatectomy. This preliminary operation often leads to a state of undernutrition which is conducive to long survival following removal of the pancreas. At least this is the interpretation of Ring and Hampel (unpublished) concerning the occasional longer survival of their cats, in which thyroidectomy or unilateral adrenalectomy preceded extirpation of the pancreas. Even the better results obtained by depancreatizing animals in two stages depends in part upon this nutritional factor.

Work on adrenalectomized diabetic cats has recently been reported by Long and Lukens.[3] Their results are strikingly similar to those which Ring and Hampel obtained on diabetic cats with Eck fistulae. One such animal survived for 17 days after the withdrawal of insulin. Near the end of this period the glycosuria disappeared and convulsions were a frequent occurrence unless food was kept constantly by the animal. These convulsions were promptly relieved by glucose ingestion. Animals in better nutritional condition survived a shorter time. The writer was unable to maintain the weight of the animals with Eck fistulae, so that he has never felt justified in drawing any conclusions from this work.

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[2] SCIENCE, November 10, 1933.

[1] From the Laboratories of Physiology in the Harvard Medical School.

[2] I. L. Chaikoff, J. J. R. Macleod, J. Markowitz and W. W. Simpson, *Amer. Jour. Physiol.*, 74: 41, 1925.

[3] C. N. H. Long and F. D. W. Lukens, SCIENCE, 79: 569, 1934.

THE TROPICAL RAT FLEA IN THE INTERIOR OF THE UNITED STATES

IN his book "Insects and Disease of Man," Fox (1925) states that the tropical rat flea, *Xenopsylla cheopis*, is not known to occur in the interior of the United States. We have been able to find no reports of this flea from this part of the country (Iowa), although rat flea data taken by members of the United States Public Health Service have shown that it commonly occurs on rats at our seaports.

In February of this year we took one specimen which we identified as *Xenopsylla cheopis* from a rat shot on the dumping ground of the city of Ames. During July we shot six more rats on the grounds and took from them 259 fleas. Examination of these showed that 257 of them were *Xenopsylla cheopis* and 2 were *Ceratophyllus fasciatus*. We are indebted to Dr. H. E. Ewing, of the Bureau of Entomology, United States Department of Agriculture, to whom we sent a male and a female flea, for confirming our determination of *Xenopsylla cheopis*.

Thus it appears that the tropical rat flea is well established in the interior of the United States. Whether it will persist here is problematic. Rothschild (1910) states that although the insect is practically cosmopolitan, it can not apparently flourish in temperate and cold climates, but Fox and Sullivan (1925) found it as far north as Boston every month of the year from December 1, 1922, to November 10, 1923.

As others have pointed out, the presence of the flea host in itself does not constitute a menace to a community, for bubonic plague has not made its appearance along the Atlantic seaboard where *Xenopsylla cheopis* occurs on rats in considerable numbers. If, however, bubonic plague should be introduced into the Middle West through shipping on the Mississippi River, or otherwise, there now exists the possibility of its becoming endemic among rats, for its vector seems to be well established.

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