without morphological micronuclei. Ten of the lines were all isolated from a "wild" mass culture of the same species, *Urostyla grandis*, found in a laboratory aquarium. Six of these lines were amicronucleate. All of the lines of all of the species have bred true with respect to the character in question and one amicronucleate line at present is at the 102d generation.

Similarly a culture of *Paramecium caudatum*, which the present writer supplied a year ago to a course in protozoölogy for the study of the nucleus, failed to reveal a micronucleus, although in other races the micronucleus was readily demonstrated.

The apparent conclusion is that a distinct morphological micronucleus is a variable character among different races of the common free-living Ciliates and this, obviously, leads to many interesting problems in relation to conjugation and endomixis.[1]

18 (1600)

A preliminary report on the experimental production of sarcoma of the liver of rats.

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The association of sarcoma of the liver of rats with *Cysticercus fasciolaris*, the larval stage of *Tenia crassicollis* of the cat, has been noted by a number of investigators, including two of the present authors; but to our knowledge no one has hitherto reported the experimental production of tumors by the employment of this parasite as an agent. The purpose of the present note is to record several cases of sarcoma of the liver in a group of 500 rats infested with the *Cysticercus* by feeding the animals eggs of the *Tenia* obtained from cat feces. Two hundred and fifty of these rats were alive when the first tumor was discovered, and 170 are still under observation.

Large tumors were discovered in the livers of four rats, 296 to 357 days after feeding. In each case the tumor originated

[1] E. M. Landis announces in the current number of the American Naturalist, Vol. 54, pp. 453–57, the discovery of an amicronucleate race of *Paramecium caudatum*.

in the wall of a single *Cysticercus* cyst, one of 30 to 50 present in this organ. Each of the involved cysts contained a worm about 20 cm. long, only one of which was living. Three of the tumors had metastasized freely into the peritoneal tissues. In each of two of the animals early and probably independent malignant changes had occurred in the walls of other cysts in the liver. Histologically, the tumors were sarcomata of either the spindle-cell or polymorphous-cell type. The transplantation of two of them into young rats resulted in 92 and 46 per cent. respectively of successful inoculations. The other two were not transplanted.

Complete data on a fifth rat which bore a tumor is lacking due to the loss of the liver through partial evisceration of the animal by his cage mates. The peritoneal tissues were, however, studded with tumor nodules which histologically proved to be spindle-cell sarcoma. In all probability these nodules were metastases from a primary growth of the liver.

19 (1601)

Further studies on intestinal implantation of bacillus acidophilus.

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The more recent observations on transformation of the intestinal flora in man have fully confirmed the earlier conclusions, which are briefly summed up as follows. The daily administration of 150–300 grams of lactose or dextrin to adults will, with few exceptions, bring about a marked change in the character of the flora in which the usual mixed types of bacteria give way to *Bacillus acidophilus* of Moro, which is a normal intestinal organism, but which is present in the intestine after early infancy in relatively small numbers only. In some instances 350–400 grams of the carbohydrates are required. The same results may be brought about with 150–300 cubic centimeters of a whey broth culture of *B. acidophilus* and with 500–1,000 c.c. of *B. acidophilus* milk, as well as with smaller amounts of the milk in combination with 100 grams of either lactose or dextrin.