The following combinations were studied: acetanilid plus sodium bicarbonate, acetanilid plus phenacetin, sodium salicylate plus salol, phenacetin plus pyramidon, acetanilid plus pyramidon and salol plus acetanilid.

It was found that acetanilid plus phenacetin and salol plus sodium salicylate combinations gave a summation effect, whereas phenacetin plus pyramidon and acetanilid plus pyramidon exhibited synergistic phenomena. The most striking combinations were acetanilid plus bicarbonate of soda and acetanilid plus salol. In the case of each of these combinations acetanilid was not as depressent as when given alone.

The effect of opiates on the behavior of rats has already been published. Investigations are in the process of completion concerning the effect of the following drugs on the memory and behavior of rats in the maze: alcohol, caffeine and nicotine; cocaine and its decomposition products; digitaloid drugs and some others. Complete data concerning the antipyretics will appear in the *Journal of Pharmacology and Experimental Therapeutics.*

17 (1599)

Amicronucleate infusoria.

By LORANDE LOSS WOODRUFF.

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It has generally been accepted that the dimorphic condition of the nucleus (macronucleus and micronucleus) is a diagnostic character of typical Infusoria, and, aside from a few primitive or aberrant species, the only apparent exceptions have revealed the micronucleus (or micronuclei) within the macronuclear membrane during vegetative stages. Recently, however, Dr. Dawson, working in this laboratory, described a race of Oxytricha hymenostoma Stokes which throughout several years of pedigree culture showed no indication of a morphological micronucleus.[1]

During the past year, the isolation for certain experiments of 14 "wild" lines representing 6 species of hypotrichous Ciliates revealed 7 lines (4 species) with micronuclei and 7 lines (2 species)

[1] J. A. Dawson, "An Experimental Study of an Amicronucleate Oxytricha," *Journ. Exper. Zoölogy*, 1919, xxix, 473; 1920, xxx, 129.

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.

By F. D. BULLOCK, M. R. CURTIS, and G. L. ROHDENBURG.

[*From Columbia University, George Crocker Special Research Fund, F. C. Wood, Director.*]

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*.