

of more or less carbohydrate in the food mixtures consumed by man and the higher animals, and the fact that sugar is a constant constituent of the blood. Furthermore, it has been concluded that carbohydrates are essential for the proper metabolism of the fats because ketone substances may be excreted in diabetes when sugar fails to be burned up in the normal manner in the organism.

We have found that *rats receiving a diet in which the amount of digestible carbohydrate was at most exceedingly small can grow from an early age to adult size*. The rations which we fed included protein—casein, edestin, or lean beef which had been thoroughly extracted with boiling water—inorganic salts, agar-agar, lard, butter fat and 0.4 gm. daily of dried brewery yeast furnishing vitamin B. The yeast can scarcely be regarded as a significant source of available carbohydrate. Success was likewise attained in experiments in which no agar-agar was introduced. In the latter case the only obvious sources of preformed carbohydrate were the yeast employed and such carbohydrate impurities as might still adhere to the protein preparation fed.

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***Paramecium calkinsi* sp. n.**

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There are at present four well-established species of *Paramecium* (*P. aurelia*, *P. caudatum*, *P. bursaria*, and *P. putrinum*) which fall naturally into two quite clearly defined groups. One group comprises *Paramecium aurelia* and *Paramecium caudatum* which are characterized by a relatively long spindle-shaped body. The other group includes *Paramecium bursaria* and *Paramecium putrinum* which exhibit a somewhat shorter and broader form, with a tendency toward a dorso-ventral flattening. All the species have a single micronucleus except *Paramecium aurelia*, which has two micronuclei each showing characteristic 'endosome' structure.¹

¹ H. S. Jennings and G. T. Hargitt: "Characteristics of the Diverse Races of *Paramecium*," *Journal of Morphology*, 1910, xxi, 495. L. L. Woodruff: "*Paramecium aurelia* and *Paramecium caudatum*," *Journal of Morphology*, 1911, xxii, 223.

The purpose of the present paper is to record the discovery in January, 1920, of a hitherto undescribed form of *Paramecium*. It has now been extensively studied in pedigree cultures for more than a year and during this time it has bred true. I therefore definitely designate it a new species, *Paramecium calkinsi*, in recognition of the fact that Professor G. N. Calkins of Columbia University introduced students of the Infusoria to exact, daily isolation, pedigree culture methods.

The general body form of the new species places it at once in the bursaria-putrinum group, but its micronuclei both in structure and number are identical with those of *Paramecium aurelia*. In brief, *Paramecium calkinsi* represents the 'aurelia' type of micronuclear complex in the 'bursaria' group of species.

Details of the structure and life history of *Paramecium calkinsi* will appear in the *Biological Bulletin*.

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The yeast test as a quantitative measure of vitamine.

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The details of this paper will be reported in full in another publication. The experiments reported covered the following points:

1. A comparison of yeast test results (Funk¹ technique) with the material used by Osborne and Mendel² in a feeding test with rats. The test was shown to merely approximate the results of the feeding test but when the dilution of the extracts were such that the content of one gram was present in 250 c.c. of water the agreement was much more exact. This result agrees with Funk's findings that the extract test must fall within the steep part of the curve of stimulation if it is to be used comparatively.

¹ Funk, C., and Dubin, H., *Journ. Biol. Chem.*, 1920, xliv, 487. Ibid., *PROC. SOC. EXPER. BIOL. AND MED.*, 1920, xvii, 175.

² Osborne and Mendel, *Journ. Biol. Chem.*, 1920, xli, 451.