

**The Culture and Division Rate of *Stentor coeruleus*.**

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Due to the difficulty of carrying on isolation cultures of *Stentor coeruleus*,<sup>1</sup> this protozoan has not been much used in pedigreed culture work. Hetherington<sup>2</sup> has recently published a culture method for this organism. He did not, however, continue the culture of *Stentor* for longer than 7-day periods, and also found some difficulty in keeping *Stentor* alive, using different types of Protozoa as food, and various media as the basis of his cultures. Beers<sup>3, 4</sup> has shown that *Didinium* can be cultured at a constant division rate if fed on a superabundant diet of *Paramecium*. At the suggestion and with the advice of Dr. J. A. Dawson, the writer began experiments to determine a suitable method of culturing *Stentor coeruleus* using *Blepharisma undulans* as the source of food.

A pure line of *Stentor coeruleus* was begun by isolating a single individual. As a result of 2 successive divisions four individuals were isolated and used to begin a pedigree culture of 4 lines. Each individual was placed in a separate culture dish containing 1.0 cc. of spring water (changed on June 18, 1936, to 0.8 cc.) of pH 7.2. The food consisted of a constant number of washed *Blepharisma undulans* (100-110 individuals per cc. of spring water). Isolations to fresh medium were made every 24 hours. The temperature at which the experiment was carried out was  $22.1^{\circ} \pm .08^{\circ}\text{C}$ . The minimum temperature during the course of the experiment was  $20.1^{\circ}\text{C}$ . and the maximum,  $25.8^{\circ}\text{C}$ .

The graph (Fig. 1) shows conclusively that the medium used is conducive to good growth of *Stentor coeruleus*, inasmuch as during the entire period the average fission rate fell below 0.5 divisions every 24 hours only 3 times, and, for the few months during which the experiment was carried on, the average rate was 6.5, with only minor fluctuations above and below. This is especially true in the last few weeks, when the technique was so perfected as to eliminate many external variables.

Although the length of time is too short for any definite conclu-

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<sup>1</sup> Stolte, H. A., *Arch. f. Protistenk.*, 1922, **45**, 344.

<sup>2</sup> Hetherington, A., *Arch. f. Protistenk.*, 1932, **76**, 118.

<sup>3</sup> Beers, C. D., *J. Exp. Zool.*, 1928, **51**, 121.

<sup>4</sup> Beers, C. D., *J. Exp. Zool.*, 1928, **51**, 485.

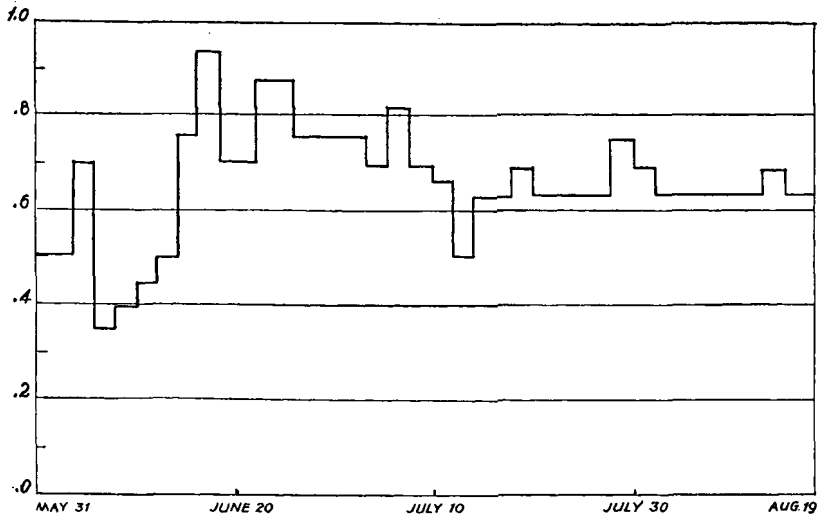


FIG. 1.

This graph shows the average fission rate for the 4 lines for 2-day periods from May 31 to August 19, 1936. The ordinates represent the average number of fissions for 2-day periods, the abscissæ represent the date.

sions concerning the question of a life cycle in *Stentor*, these results seem to point in the direction of the more recent work. Until 1925, the predominant view with regard to this question was that such a phenomenon actually existed, and that a race would die out unless a nuclear reorganization of some sort took place.<sup>5, 6, 7</sup> The more recent work,<sup>3, 4, 8, 9</sup> however, seems to point in the opposite direction, namely, that all variations are due to fluctuations in the environmental conditions, and the death of the line is due to an unfavorable environment. Since, in this experiment, the average division rate was quite constant, and the animals were apparently as healthy at the end as at the beginning, the indication is that *Blepharisma undulans* provides an adequate diet for *Stentor coeruleus*. Experiments are being carried on to ascertain whether or not a 'life cycle' exists in *Stentor*.

<sup>5</sup> Calkins, G. N., *J. Exp. Zool.*, 1915, **19**, 225.

<sup>6</sup> Calkins, G. N., *Am. Nat.*, 1916, **50**, 257.

<sup>7</sup> Calkins, G. N., *J. Exp. Zool.*, 1919, **29**, 121.

<sup>8</sup> Dawson, J. A., *J. Exp. Zool.*, 1926, **46**, 345.

<sup>9</sup> Richards, O. W., and Dawson, J. A., *J. Gen. Physiol.*, 1927, **10**, 853.