served that the normal individual showed only a very slight decrease. One of the Class I cases presented no change, the other a slight decrease. One of the Class II A cases showed very little change, but the other presented a moderate decrease. Both Class II B cases showed a moderate decrease.

The results suggest that after performing an equal amount of work, the majority of the cases with severely damaged hearts will show a definite decrease in the CO_2 combining capacity, whereas the normal individual or the patient with a mild degree of heart damage will not present the same degree of change in this constituent. These observations suggest that the determination of the CO_2 combining capacity may be of value in the classification of patients with damaged hearts.

This is a preliminary report.

[1] Barr, D. P., Himwich, H. E., and Green, R. P., *J. Biol. Chem.*, 1923, lv, 495.

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Studies on the Life History of Blepharisma undulans.

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Studies on the life history of *Blepharisma undulans* have been in progress for over five and a half years, all the animals employed being the progeny of a single individual isolated November, 1921. The work was planned to determine, in particular, the viability of this infusorian in the absence of fertilization, and the effects of fertilization on the rate of reproduction, in an attempt to broaden the results from our earlier studies on *Paramecium aurelia*[1] and *Spathidium spatula*.[2] A preliminary statement of the characteristics of this race of *Blepharisma undulans* was presented in 1922.[4]

Whereas earlier workers on this organism found that conjugation occurred rather infrequently and invariably was followed by death, conjugation was readily induced in our pedigree cultures, and the exconjugants proved to be viable in nearly every case. Accordingly excellent material was afforded for the problem at hand.

Two conclusions may be emphasized from the data secured to date:

(1) The animals of this race of *Blepharisma undulans* may reproduce apparently indefinitely without recourse to conjugation; there being no "cycles" in the vitality of the organism, as evinced

by the division rate or otherwise, which terminate in death when fertilization is prevented.

(2) Animals isolated from a pedigree line and allowed to conjugate immediately show a markedly higher rate of reproduction than that of the parent line, and this accelerated division rate is maintained for at least thirty days and, usually, until the experiment is discontinued.

In brief, the conclusions derived from Paramecium[1] and Spathidium[2, 4] that these infusorians are capable of unlimited reproduction, under favorable environmental conditions, without recourse to fertilization may now be extended to Blepharisma; and, furthermore, the conclusion that fertilization accelerates the division rate, as previously demonstrated in Uroleptus[3] and in Spahidium,[2] may now be extended to Blepharisma.

These studies have been aided by a grant from the Bache Fund of the National Academy of Sciences.

This is a preliminary report.

[1] Woodruff, L. L., *Quart. Rev. of Biol.*, 1926, i, 436.

[2] Woodruff, L. L., and Spencer, PROC. SOC. EXP. BIOL. AND MED., 1921, xviii, 240, 303; *J. Exp. Zool.*, 1924, xxxix, 133.

[3] Calkins, G. N., *J. Exp. Zool.*, 1919, xxix, 121.

[4] Woodruff, L. L., and Spencer, PROC. SOC. EXP. BIOL. AND MED., 1922, xix, 339.

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Inheritance of Atypical Form in Paramecium aurelia.

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In all of the lines of a pedigree culture of *Paramecium aurelia*, which had been derived from an animal isolated from the Woodruff culture, in approximately the 12,000th generation, and bred on beef extract in the usual way, there appeared animals showing a "lump" on the peristomal side of the posterior end.[1] During the next week similarly atypical animals appeared in a hay infusion mass culture, which had been seeded with animals from the above lines three months prior to the appearance of the "mutation", and also in the lines of a second pedigree culture derived from an animal isolated from this mass culture.

These atypical animals appeared healthy and active and when