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.

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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.

IMOGENE MOORE. (Introduced by L. L. Woodruff.)

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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

isolated each gave rise to two daughter cells showing the lump. As a rule the lump was visible in both daughter cells before division was complete, although in a few cases, it was not apparent until several hours afterward. Furthermore the lumps showed considerable variation in size. With such variations, however, the character persisted in all of the lines, none of them ever again showing a perfectly typical animal.

In the course of time the vitality of the animals became slightly lowered, and at the end of 25 days some of the lines died, having attained from 16 to 24 generations. The remaining lines are still in pedigree, having retained the lump for 30 generations, or 2 months. In the latter lines at least one definite period of endomixis has occurred without any apparent effect on the new character.

In brief, a new character has arisen, in a manner unknown, almost simultaneously in a number of different though related lines and has been inherited, so far, through 30 generations, involving one endomictic period.

This is a preliminary report.

[1] Woodruff, L. L., *Quart. Rev. of Biol.*, 1926, i, 436; Dawson, J. A., *J. Exp. Zool.*, 1926, xliv, 133.

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Further Observations on the Precipitable Substances of B. typhosus and B. paratyphosus B.

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In preceding notes[1] two different precipitable substances derived from *B. typhosus* were mentioned which, according to the high N content and digestibility by trypsin seemed to be of protein nature and different from the trypsin resistant antigen of Douglas and Fleming. When a solution prepared according to the directions of these authors was precipitated with alcohol, first in alkaline, then in acid solution, a product was obtained almost biuret free and yielding much reducing sugar on hydrolysis. A substance with similar properties was prepared as follows: Typhoid bacilli were extracted with N/2 NaOH for 1½ hours at 37°, the solution adjusted to slight alkalinity, centrifuged and the supernatant fluid precipitated