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.

J. FURTH AND K. LANDSTEINER.

From the Laboratories of the Rockefeller Institute for Medical Research, New York.

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

with alcohol. The precipitation with alcohol was repeated once in alkaline and once in acid solution removing each time some insoluble material. A further precipitation was made with barium hydroxide solution. The substance gave faint or negative protein reactions and yielded about 40 per cent reducing sugar (calculated as glucose) after heating for 5 hours with N/2 HCl. It reacted intensely with common immune sera for *B. typhosus* and for *B. enteridis* Gärtner, and with sera prepared with the antigen of Douglas and Fleming, slightly, if at all, with an immune serum for *B. paratyphosus B*. Negative or very feeble reactions were obtained with immune sera for the two preparations from *B. typhosus* mentioned above.

A typhoid immune serum absorbed with alcohol treated bacilli, still containing the so-called large flaking agglutinins (Weil and Felix) was without action on any of the above three preparations. It would seem, therefore, that they all may be different from the labile agglutinogen, supposed to be connected with the agglutination of the flagelli (Smith and Reagh,[2] Beyer and Reagh[3]).

The precipitable substance of *B. paratyphosus B* previously obtained by extraction with dilute alcohol was since prepared in another way. The bacilli washed with saline and 95 per cent alcohol and extracted with hot alcohol were heated for two hours with saline solution on the steam bath. After centrifugalization the saline solution was acidified and the precipitate removed. The supernatant fluid was precipitated in alkaline solution (1/10 N) with 1 to 2 volumes of alcohol. The material was dissolved and again precipitated with alcohol in alkaline and in acid solution. The yield amounted to 10 to 20 mg. per Blake bottle. In the present state the preparation was almost protein free, gave the values C 43.82 per cent, H 6.51 per cent, N 1.86 per cent, P 2.06 per cent. On hydrolysis for 4 hours it yielded 56.1 per cent reducing sugar, calculated as glucose.

This is a preliminary report.

[1] Landsteiner, K., and Furth, J., PROC. SOC. EXP. BIOL. AND MED., 1927, xxiv, 379, 602.

[2] Smith, Th., and Reagh, A. L., *J. Med. Res.*, 1903, x, 89.

[3] Beyer, H. G., and Reagh, A. L., *J. Med. Res.*, 1904, xii, 313.