the stain. One such appearance is shown in the photomicrograph reproduced as Fig. 1, *b*.

These appearances suggest that, in some instances at least, the bacterial spore certainly has a function other than that of a resistant resting stage, namely, that it provides an opportunity for rearrangement of chromatin material.

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Feb. 4.

[1] Stoughton, R. H., *Proc. Roy. Soc.*, B, **105**, 469 (1929–30).
[2] Hadley, P. J., *Infectious Dis.*, **40**, 1 (1927).

Development *in vitro* of the Mammalian Gonad

IN recent experiments the entire mammalian gonad has been successfully cultivated *in vitro* and the explants continued to differentiate during cultivation.

The ovary and testis from young and embryonic rats and mice were grown by the watch-glass method on the surface of a clot composed of equal parts of fowl plasma and fowl embryo extract. For each culture, one gonad was fixed as a control.

A typical maturation division figure was observed in an explanted ovary from a four-day (post-embryonic) rat after 9 days' cultivation (Fig. 1). The appearance of the figure was preceded by an actual growth of the ovum.

Small, normal Graafian follicles differentiated *in vitro* in the ovaries of two 19-day rat embryos and of three new-born mice, although the controls showed that at the time of explantation the germinal tissue was in the form of sex cords and contained no Graafian follicles. Some of these follicles remained healthy after twenty-two days *in vitro*. Many residual ova survived *in vitro* for an equally long time. After a month *in vitro*, the organ degenerated.

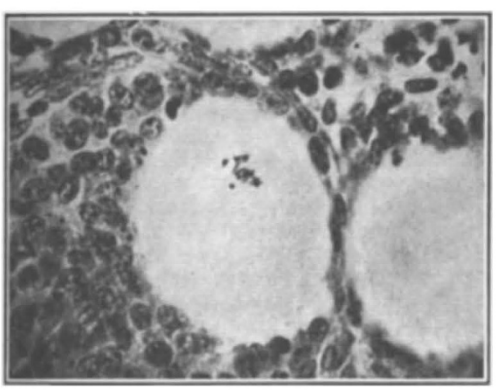

Fig. 1.

OVARY FROM A FOUR-DAY (POST-EMBRYONIC) RAT AFTER 9 DAYS' CULTIVATION *in vitro*. (ALLEN'S MODIFICATION OF BOUIN'S FLUID; MAYER'S HAEMATOXYLIN. × 640.)

The testis also grew and differentiated *in vitro*. In the explanted testis of a new-born mouse, spermatocytes in the typical pachytene phase of the meiotic prophase had developed *in vitro* after 11 days' cultivation (Fig. 2), although only spermatogonia were present at the time of explantation. Similar spermatocytes were also observed in the explanted testis of a 17-day mouse embryo after 16 days *in vitro*.

So far, spermatogenesis *in vitro* has always stopped at the pachytene stage of meiosis, although female germ cells growing under the same conditions seem to pass through this phase without difficulty. This point requires further investigation.

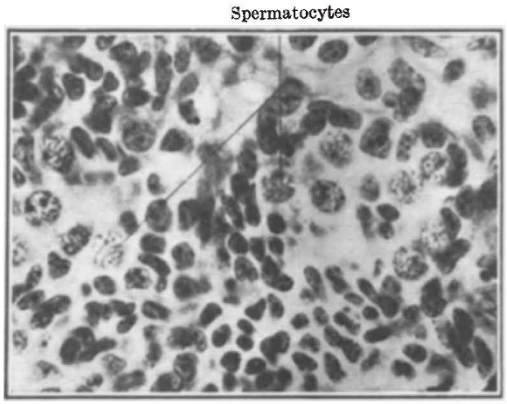

Fig. 2.

TESTIS OF A NEW-BORN MOUSE AFTER 11 DAYS' CULTIVATION *in vitro*. TYPICAL SPERMATOCYTES SHOWING CHROMATIN FIGURES OF THE EARLY MEIOTIC PROPHASE HAVE DIFFERENTIATED *in vitro*. (ALLEN'S MODIFICATION OF BOUIN'S FLUID; MAYER'S HAEMATOXYLIN. × 640.)

Many seminiferous tubules maintained their original form for as long as 17 days' cultivation, but the germ cells mostly degenerated by the twentieth day *in vitro*.

The results so far obtained have provided a new experimental approach to several problems of sex physiology.

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Metamorphosis of the Larva of *Ostrea edulis*

ALTHOUGH we now have a complete description of the fully-developed larva[1] of the European oyster (*Ostrea edulis*), we have as yet no account of the metamorphosis which takes place when the larva attaches itself and becomes the settled spat. The smallest spat yet described is that figured by Yonge[2]. The shell of this individual measured 1·2 mm., whereas the shells of fully-developed larvæ before settlement average only 0·30 mm. There is therefore a considerable gap which requires to be bridged by the description of smaller spat.

I have been able to obtain a number of such early stages attached to glass slides, and, with the addition of further material during the coming season, it may be possible to prepare a complete description of the metamorphosis. The material already collected shows the evolution of the posterior adductor as the one shell muscle, and the development of the gills. The fully-developed oyster larva, as described by Erdmann[1], possesses anterior and posterior adductor muscles about equal in size and symmetrically placed with regard to the hinge. At this stage the rudiments of six gill filaments on the left side are shown by Erdmann. The earliest settled spat that I have yet