

guinea pigs ovariectomized on days 3 and 5 post coitum and killed on day 24 and day 28 respectively. For the last 11 days only, these had received 10 mgm. of progesterone daily with the addition of 2  $\mu$ gm. oestrone on the fourth and fifth days of injection, but the size of the fetuses indicated that implantation must have occurred without obvious delay at about the normal time. Accordingly, 12 guinea pigs were ovariectomized on days 3, 4, or 5 post coitum and were killed at 10-13 days post coitum, having received no exogenous hormone. Eight of these showed normal implantation swellings, but regression had begun in one. Nine similarly treated animals killed 14-18 days post coitum all had implantation sites, most of which were regressing.

Further experiments showed that if similar ovariectomized mated guinea pigs were given 10 mgm. progesterone daily from day 11 post coitum, normal embryos were found at day 21 in 6 out of 10, indicating that implantation and development could proceed satisfactorily in the absence of ovaries and exogenous hormones up to at least day 11 post coitum. Three of the four other animals showed regressing implantation sites.

The only other species in which the blastocysts are reported to implant after ovariectomy is the armadillo<sup>6</sup>, where there is a long delay period in the uterus. Loeb<sup>9</sup> suggested that in the guinea pig sufficient corpus luteum secretion has acted on the uterus by 75 hr. post coitum for a limited development of decidual tissue. In the present work implantations have been found in 35 out of 42 three-, four- and five-day ovariectomized animals, and it would seem either that the amounts of ovarian hormones required to sensitize the uterus are exceptionally low in the guinea pig, or that other supplies are available, perhaps from the adrenals.

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<sup>6</sup> Nelson, W. O., *Endocrinol.*, 18, 33 (1934).

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### Response of Larvæ of *Calyptraea chinensis* (L) to Light

THE veliger stage of the prosobranch *Calyptraea chinensis* is passed in capsules fixed to the substratum and guarded under the fore part of the shell of the parent. The young hatch as crawling post-veliger larvæ. During studies on the reproduction of this animal at Plymouth, embryos of all stages were examined at night in sea water in a glass dish lit only by a hooded microscope lamp. Freed veliger larvæ of stages 5 and 5a (unpublished work) were seen to mass in the illuminated part of the dish facing the light. The early and middle larvæ swam well; many of the late veliger larvæ alternately swam and crawled. The later veliger larvæ, which had been

ready to hatch, crawled only. When the position of the light was changed, the veligers swam or crawled towards the light. Other newly liberated marine larvæ show a similar response. Larvæ of *Lepidochitona cinereus* aggregate in regions of low light intensity<sup>1</sup> and larvæ of *Spirorbis borealis* are photopositive for up to 2 hr.<sup>2</sup> The nauplii of barnacles are generally photopositive<sup>3</sup> and the cyprids also<sup>3</sup>. The response to incident light by the early and middle veliger larvæ of *Calyptraea* is interesting as the larvæ are never free-swimming and are enclosed under the shell where there is little light.

Hatched larvæ kept in glass finger bowls under circulating sea water were active, crawling over the bottom and lower sides. When the animals were about 1 mm. shell diameter (about 9 days after hatching), a glass slide was placed in a bowl, resting about 2 cm. from the bottom. Although a few animals remained on the bottom of the bowl, most congregated on the under-side of the slide, especially where it touched the sides of the bowl. None was seen on the top of the slide. When an empty *Paphia* shell was placed in a bowl containing newly hatched animals and others 1 week old, most were found next morning on the under-side of the shell, where they stayed. In the River Yealm near Plymouth, small *Calyptraea* of less than 2-mm. shell diameter were found on the under-side of empty *Paphia* shells. Adults, however, were found mostly on the upper surfaces of stones, shells and glass, to which they are confined by their need for a smooth surface.

It appears from these observations that although the retained veliger larva would be positively phototropic if free, the hatched animal crawls until it finds the under-side of a surface whether dark or illuminated. Adults are found on any smooth surface.

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### A Red Water Bloom of Rotifers in Cook Strait, New Zealand

ON September 11, 1959, during an oceanographic cruise by M.V. *Viti* in Cook Strait, the sea surface was observed to display a blood-red discoloration in large, streaky patches over a stretch of 2-3 miles. Two samples were collected by Dr. D. E. Hurley from the surface in a phytoplankton tow net made of No. 25 bolting nylon: one 10 miles south-west of Kapiti Island (1603-1610 hr., 41° 01' S., 174° 28' E.—N.Z. Oceanographic Institute Station C 201), the second about 2 miles farther south (1708-1735 hr., 41° 04' S., 174° 31' E.—N.Z. Oceanographic Institute Station C 203). The latter was deep-frozen, the former preserved in 5 per cent neutral formalin.

Six days later, microscopic examination in the laboratory showed the dominant organisms to be rotifers. In the formalin-preserved sample, ctenophores (identified by Miss P. M. Ralph, Victoria University of Wellington, as *Pleurobrachia pileus* Vanhöffen) occurred in large numbers; but in the deep-frozen sample rotifers were the sole dominants. Both samples were collected from areas where the red colour of the water was pronounced. Mr. C. R. Russell (Canterbury Museum, Christchurch) has con-