



Fig. 1.  $P$  is probability of escaping deformity.  $r$  is ordinal position of a particular foetus measured from the vaginal side.  $n$  is total number of young in horn. (Both  $r$  and  $n$  vary from 1 to 8)

the plug was detected being taken as day 1 of the pregnancy. Each animal received 8,000 i.u. vitamin A acetate dissolved in 'Tween 80' (ref. 1) by subcutaneous injection on day 11 of pregnancy. On day 18 of pregnancy all the animals were killed. Each foetus was examined for the presence of cleft palate, and its position in the uterine horn was recorded.

Statistical analysis of the findings revealed two points of interest. First, fetuses situated at the ovarian end of the uterine horn were found to be less subject to cleft palate than those at the vaginal end (Fig. 1). Secondly, the probability of cleft palate increased as the number of young in the horn increased.

There are a number of possible explanations for these findings. Since the critical period for the production of a deformity by hypervitaminosis-A is quite sharply defined, the stage of development of an embryo might be expected to have a considerable influence on its response to the teratogenic agent. It is interesting to note, therefore, the observations of Mossman<sup>2</sup> that in the mammalian bicornuate uterus the embryos implanted nearest the oviduct are always more advanced than those at the vaginal end. The weight of the embryo and the degree of development of the placenta at the time when vitamin A is administered are both factors which may play a part in determining whether a malformation does or does not occur. McLaren and Michie<sup>3</sup> found that in the mouse the embryos in the top half of the uterine horn were heavier than those in the lower half at 18½ days post coitum.

McLaren and Michie<sup>4</sup> suggested that the blood supply at the site of implantation might be an important factor in determining the occurrence of runting. It is generally agreed that foetal weight in the mouse varies inversely with the number of young in the uterine horn. The more crowded the horn, the smaller are the individual fetuses. This may have some bearing on the finding of the present investigation that the highest incidence of cleft palate was in the more crowded horns. It is hoped that estimations which are now being made of the levels of vitamin A in the placenta and liver in normal and malformed litter mates will throw light on the connexion established by the present series of experiments between uterine position and the degree of susceptibility to hypervitaminosis-A.

Our thanks are due to Dr. P. Whittle of the Statistical Laboratory, Cambridge, for the statistical analysis and to Messrs. Vitamins, Ltd., for supplying the preparation of vitamin A. The work was supported by a grant from the Medical Research Council.

D. H. M. WOOLLAM  
J. W. MILLEN

Department of Anatomy,  
University of Cambridge.

- <sup>1</sup> Millen, J. W., and Woollam, D. H. M., *Nature*, **185**, 249 (1960).  
<sup>2</sup> Mossman, H. W., *Contr. Embryol. Carneg. Inst.*, **26**, 129 (1937).  
<sup>3</sup> McLaren, A., and Michie, D., *Mem. Soc. Endocrinol.*, No. 6, 65 (1959).  
<sup>4</sup> McLaren, A., and Michie, D., *Ciba Found. Symp. Congenital Malformations*, 178 (J. and A. Churchill, Ltd., London, 1960).

### Development of Eggs from a Hermaphroditic Sea Urchin

REPORTS of hermaphroditic sea urchins are not common. For *Arbacia punctulata* six examples are recorded over a period of twenty-five years by Harvey<sup>1</sup>. Since 1956, one report has been made<sup>2</sup>.

In the course of work carried out in the summer of 1959, a hermaphroditic *A. punctulata* was found at Beaufort, North Carolina. On being subjected to an electric shock, two gonopores exuded sperm. Eggs were obtained from the remaining three pores. Each pore required individual stimulation in order for shedding to occur, and each gave viable gametes. The eggs were of normal size (80 $\mu$ ) for *Arbacia* collected in this area.

Since unfertilized eggs could be obtained, a study was made to compare the percentage fertilization and the rates of development of self-fertilized eggs and eggs fertilized by sperm from another male. As a control, additional eggs were reserved without sperm. All work was carried out at 23° C.

No indication of fertilization or cleavage was found in the controls. More than 85 per cent fertilization was obtained in both the self-fertilized and cross-fertilized egg batches. All stages of development up to the pluteus stage were directly comparable in both groups, and occurred at the normal rate for this temperature. No abnormal morphology was found.

This work was done during the tenure of a C. W. Hargitt fellowship which I gratefully acknowledge.

D. S. FRY

Department of Zoology,  
Duke University,  
Durham, North Carolina.

- <sup>1</sup> Harvey, E. B., *The American Arbacia and Other Sea Urchins* (Princeton University Press, Princeton, 1956).  
<sup>2</sup> Zimmerman, A. M., Zimmerman, S. B., and Harvey, E. B., *Biol. Bull.*, **119**, 353 (1960).

### Disintegrated Spermatozoa from the Epididymis

IN the course of an investigation of the response of spermatozoa in the epididymis of rabbits to the effects of artificial crytorchidism, it was noted that in the controls (that is, 12 normal epididymides on which no operative interference had been undertaken) a remarkable number of immotile decapitated spermatozoa was present in samples withdrawn from regions of the tubule proximal to the cauda epididymidis. Spermatozoa of this kind have been previously referred to as 'disintegrated spermatozoa'<sup>1,2</sup> and presumably indicate a process of degeneration.