

content') of the field. Smoothing of the electrical signal is clearly taking place; from the results with single pulses (Fig. 2) it is possible to infer² that the time-constant is about 20 msec. The fish is more sensitive to wide single pulses than to d.c.; this suggests that a sensory signal is initiated both by the beginning and the end of the pulse. Such an effect has been demonstrated electrophysiologically in gymnotids³.

The sensitivity of *Clarias* to low-frequency pulse trains is shown in Fig. 3, and differs little from its sensitivity to the corresponding single pulses. Apparently the perception time is sufficiently short that the fish responds on the first pulse of the train; if adaptation is taking place, it must have a time-course rather longer than the perception time. With *Clarias*, therefore, information about adaptation is not available from experiments of the present type.

Gymnarchus niloticus, an electric fish possessing an exceedingly efficient object-locating mechanism, will respond to an electric field as low as 0.15 μ V/cm. The sensitivity of *Clarias*, in which no continuous electric discharge has been found, is only a factor of five worse than this. What purpose, if any, does this remarkable sensitivity serve in the normal life of the fish? Perhaps, as has been suggested³, the fish can detect action potentials from predators or prey. Alternatively it may locate nearby moving fish by detecting electric currents set up by the movement of water in the Earth's magnetic field^{1,3}. It is, in any event, almost inconceivable that this great electrical sensitivity is fortuitous, and not used by the fish in any way.

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Functional Polyovuly in the Sei Whale *Balaenoptera borealis* Lesson

On September 1, 1962, a female sei whale, 50 ft. long, was landed at Donkergat whaling station, Saldanha Bay, South Africa. It was found to be pregnant, with two fetuses in the same cornu of the uterus but within separate foetal membranes. There was only one corpus luteum of pregnancy in the ovaries so the twins were at first presumed to be monozygotic. However, of the two fetuses, one proved to be male, 38 cm long, weighing 746 g, and the other female, 39.5 cm long, weighing 737 g (Fig. 1. Scale = 20 cm).

When the ovaries were sectioned no evidence was found of any other recent luteal tissue representing a follicle from which a separate ovum could have originated. The only explanation therefore seems to be that the Graafian follicle concerned released at least two ova, and that fertilization occurred separately and almost simultaneously.

Polynuclear oocytes and polyovular follicles have been recorded from a number of animals, notably the opossum and dog¹, but they are usually thought to be most common in immature ovaries or among young follicles in a mature ovary. It seems that as the follicle approaches maturity the extra ova degenerate or the follicle becomes atretic,

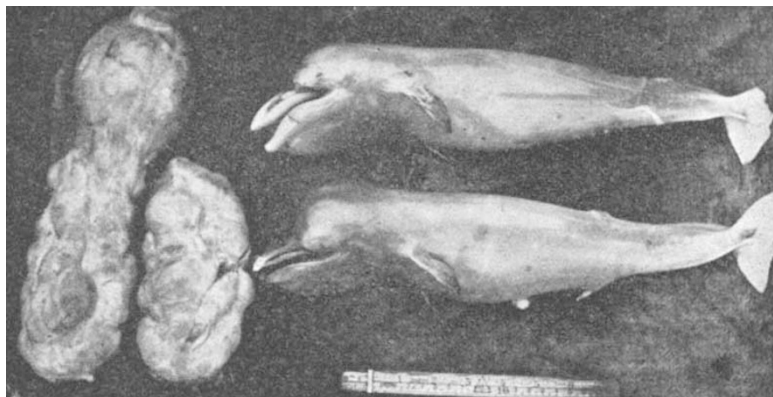


Fig. 1

although Desai² believes that in the adult rabbit, at least, resistance to atresia is greater in polyovular follicles than in monovular ones. Actual records of functional polyovuly in mammals are extremely rare. Corner³ found in many hundreds of pregnant uteri of the sow only three or four examples where the number of embryos exceeded the number of corpora lutea, accounting for them by polyovuly and single-ovum twinning. In a sample of 2,179 rabbit litters, Allen, Brambell and Mills⁴ calculated that only 0.23 per cent of the follicles ovulating could have been polyovular. On the other hand, Davis and Hall⁵, who examined the ovaries of 394 wild Norway rats, suggested that the presence of polyovular follicles in at least 12 per cent of the animals could account for 20 out of 95 pregnant rats having more embryos in the uterus than corpora lutea in the ovaries.

Mackintosh and Wheeler⁶ and Matsuura⁷ both considered that whales might release more than one ovum at an ovulation, but Kimura⁸ assumed that this possibility could be ignored. Up to the present time comparatively few sei whales have been examined by biologists, so that the significance of the present record cannot be appreciated until a larger sample has been examined. Kimura, however, showed that the sei whale seems to have a higher frequency of multiplets than any of the other large cetaceans.

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Capillary Plexuses in Gastropods stained by the Novikoff Reaction for Thiamine Pyrophosphatase

THE vascular system of molluscs is often spoken of as an 'open' one, wherein the exact relations of the arterial vessels to the venous system of vessels and lacunar spaces is as yet undetermined. The absence of an endothelium makes detection of the smallest vessels difficult and capillary plexuses as such have not been described in Gastropoda.