Ben-Abraham points out that at moderately supersonic speeds such excitations are highly unstable and have not been observed. The concentration of energy in such an excitation would give the appearance of a massive object in the solid, and in one dimension a boundary would exist dividing regions of subsonic and supersonic space. Ben-Abraham suggests therefore that as tachyons could only exist in regions inaccessible to normal subsonic particles this provides an indication that they are unlikely to occur in practice.

SYSTEMATICS

Paradox may be Solved

from our Marine Vertebrates Correspondent

SYSTEMATIC ichthyologists have made fine play with the relationships of the seahorses, pipefishes and their allies, and the sticklebacks. These creatures have been placed at almost opposite ends of the teleost classification, brought together, and then united in one order. One of the gems that confirmed the unitarians in their belief in a single order was the discovery in Lake Indawgyi, Burma, in 1926, of an enigmatic small fish later to be named *Indostomus paradoxus*. This seemed to bridge the two groups, as a stickleback-like pipefish with the long snout and body armour of the pipefishes, and a series of isolated spines along its back as in the sticklebacks. Now a study by K. E. Banister (*Bull. Brit. Mus. (Nat. Hist.) Zool.*, **19**, No. 5, 179; 1970) suggests that these resemblances are purely superficial and *Indostomus* is not related to either group.

Originally *Indostomus* was placed in the pipefish order Solenichthyes by its discoverers Prasad and Mukerji (*Rec. Indian Mus.*, **31**, 161; 1929), and Bolin later confirmed this (*J. Wash. Acad. Sci.*, **26**, No. 10, 420; 1936), although differing in his assessment of relationship within the family. Berg's classification of fishes lumped *Indostomus* in with his pipefish order Syngnathiformes, but more recently Greenwood *et al.* (*Bull. Amer. Mus. Nat. Hist.*, **131**, No. 4, 339; 1966) placed it in a holdall order of Gasterosteiformes. The basic difficulty with *Indostomus* was two-fold: first, its anatomy had never been properly studied or described, and second, because it was a highly modified fish its systematic position was unclear.

Indostomus paradoxus.

The first of these difficulties has now been overcome with Banister's detailed examination of the skeleton. He finds fifteen major features in which *Indostomus* differs from the sticklebacks and their most primitive family the Aulorhynchidae, while the external body armour and pronounced snout are only superficial resemblances to the pipefishes. Banister's conclusion on the second point is that this curious little fish is sufficiently distinct to be placed in a new order Indostiformes, of which it is the sole member. The position

of this order within the fish system, however, seems to be if not a paradox then as enigmatic as ever, and a tentative situation near the clingfish order Gobiesociformes is proposed.

But what of the fish itself? Banister's report concludes with a fascinating account of this peaceful little fish by Alan Tubb of the UN Food and Agriculture Organization in Thailand, who collected 140 specimens and kept them alive in aquaria. From these notes (the first on the behaviour or biology of the species) *Indostomus* can be seen as quiet, peaceful and generally slow-moving, although it can be swift when alarmed. It feeds entirely on living animal food, slowly stalking its prey with fins depressed, except for the fluttering of its pectoral fins. In spite of its seemingly rigid body armour *Indostomus* is remarkably flexible and seems to be able to move its head at an angle of some 10° to the body in all directions, an unusual accomplishment in a fish. Evidently *Indostomus* is a fish well endowed with surprises for the ichthyologist.

EMBRYOLOGY

Very Early Mammals

from a Correspondent

THE successful manipulation of the mouse blastocyst provided the topic for one of the most impressive contributions to the Schering symposium on intrinsic and extrinsic factors in mammalian development, held in Venice from April 20 to 24. Dr R. L. Gardner (University of Cambridge) reported that microsurgical techniques can be used to separate the trophoblast from the inner cell mass (ICM), and that the two components are markedly different in their behaviour and growth potential after transfer to the uteri of pseudo-pregnant recipients. Thus, grafts of trophoblast alone can induce decidualization, but otherwise fail to proliferate. By contrast, fragments of ICM develop within the host and produce normal young; pairs of such ICMs can be fused *in vitro*, even when their ages differ by twenty-four hours. Blastocysts and mere trophoblastic envelopes can also serve as carriers of an ICM of a different genotype, with subsequent mixing of their cells and formation of viable chimaeras. Such blastocysts "reconstituted" after *in vitro* manipulation provide a powerful new system for examining the diverse interrelations of trophoblast, foetus and the maternal environment. Gardner's results also suggest that the number of cells from which the embryo proper develops may be remarkably small.

The extraordinary resilience and ability to fuse of cleaving mouse eggs were demonstrated on film by Professor J. G. Mulnard (Brussels), while Dr W. K. Whitten (Bar Harbor) reported his highly successful technique for culturing pre-implantation embryos in an exactly defined chemical medium, with a high yield of normal mice following transfer to the uteri of pseudo-pregnant hosts.

Dr T. G. Baker (University of Edinburgh) provided convincing ultrastructural proof that the mammalian oocyte in the prolonged diplotene stage of meiotic prophase is not, as too often assumed, resting, but synthesizes ribonucleoprotein and actively contributes to the growth of the surrounding follicle.

The importance of the biochemical milieu en-