

angler even the tail, in most of our common fishes as slender as the blade of a knife, is rendered thick and club-like. Delicate strands appear to pass across this fluid-filled sub-epidermal space, as in the lamprey, the angler, and other fishes. It is not difficult to surmise that this gelatinous layer around the delicate trunk serves a purpose identical with that of the amnion and other cushion-like coverings in the reptilian, avian, and higher vertebrate embryos. Buffeted about in the surface waters of the sea, or carried hither and thither by strong currents in lakes and rivers, minute larval fishes might suffer severely were it not for these surrounding coats of membrane and abundant fluid. Like the fatty blanket or blubber of the cetacean's skin, these layers preserve the larvæ from hurtful alterations of temperature. Most of our marine food-fishes, such as the cod, haddock, mackerel, sole, plaice, etc., exhibit "sub-epidermal" enlargements of this character, and over the head-region, where the sensitive brain, the delicate ears, eyes, and other important organs are located, they serve to shield these parts from the shocks of the surrounding water. The larval sole exhibits curious enlargements in the anterior region, and in the small Irish sole, recently described by an able scientific observer, Mr. E. W. Hutton; they have the form of a huge bladder protruding from the forehead. But in the angler (*Lophius*) these enlargements, as already stated, reach a most extraordinary stage of development. Thus the cavity over the spinal cord and brain, enclosed by the arachnoid sac, probably the "subdural space" of higher forms, is extremely large. It is roofed over by the coloured serous membrane, external to which is a "peri-neural" space limited externally by a delicate membrane, the last forming the floor of a third or "sub-epidermal space" proper, common to all young fishes and outwardly limited by the integument. The delicately organised central nervous system is thus shielded from pressure and external agitations by this triple envelope of fluid-filled chambers and protective membranes. No doubt these have some interesting phylogenetic meaning, if we could only discover it; but they may without hesitation be regarded as amongst the most interesting and important protective provisions for securing the welfare of the frail organisms possessing them during larval life. Their minuteness