structures are most developed in the Australian genus *Phyllo- pteryx,* one of the most singular types of littoral fishes.

Sea-horses belong to the tropics and do not extend so far north as pipe-fishes. They are abundant at suitable localities, chiefly on the coral-banks of the Indo-Pacific Ocean. Some forty species are known, of which the majority belong to the genus *Hippocampus* proper. They vary from 2 to 12 in. in length; but in China and

Australia a genus (*Solenognathus)* occurs, the species of which attain to a length of nearly *2* ft.; they, however, in form resemble pipe-fishes rather than sea-horses. The species which may be sometimes seen in European aquaria is *Hippocampus antiquorum,* common in the Mediterranean and on the coasts of Portugal and France. It is rare on the south coast of England, but it has often been captured on the Essex coast. About 1885, according to Dr J. Murie, two Leigh fishermen when shrimping at Harwich during the summer season succeeded in procuring altogether between 100 and 120 specimens. The food of the sea-horses consists probably of very small invertebrates and the fry of other fishes. Like the other Lophobranchiates, they take great care of their progeny. The male *Hippocampus* carries the ova in a sac on the lower side of the tail, in which they are hatched; in the other genera no closed pouch is developed, and the ova are embedded in the soft and thickened integument of cither the abdomen or the tail.

All that is known of the habits of these interesting fishes will be found summarized in a valuable paper by T. Gill, “The Life History of the Sea-Horses (Hippocampids),” in *Proc. U.S. Nat. Mus.* xxviii.

(1905), p. 805.

SEA-KALE, *Crambe maritima,* a hardy perennial, a member of the natural order Cruciferae, which grows wild along the coasts of England, of Ireland and of the Scottish lowlands, along the western coasts of Europe, and on the Baltic, reappearing on the Black Sea.

In cultivation sea-kale prefers a light dry soil, and when manure is necessary it should consist of sea-weed or well-rotted dung; or a dressing of salt or of nitrate of soda may be given. When raised from seeds, they should be sown in March or April in rows 1 ft. asunder, the plants being thinned to 6 in. apart. In the following March these should be planted out in trenched well-prepared ground, 2 ft. asunder, in rows 2½ to 3 ft. apart. The top with the crown buds should be cut off before planting to prevent them from running to seed. In the spring of the second year the young shoots if blanclìcd will be fit for use, and therefore the summer growth should be promoted by the use of water and liquid manure. Tolerably blanched stalks may be produced by plants only nine months old from the seed, and after two summers seedling plants will have acquired sufficient strength for general cropping. The seeds, instead of being sown in rows and transplanted, may be deposited in patches of three or four together, where they are to remain. In the autumn, after the leaves have been cleared off, the ground should be forked up, and 6 or 8 inches’ depth of leaves or of light sandy soil laid over the plants, by either of which means they will be blanched, though not forced. The blanched sprouts should be cut for use whilst they arc crisp, compact and from 3 to 6 in. in length, the stem being cut quite down to the base.

Sea-kale beds may be made from cuttings of the roots of very healthy plants, the extremities of the roots, technically called “ thongs,” being best adapted for this purpose. They should be taken up in autumn, cut into lengths of about 4 in., and laid in a heap of sand or earth till spring, when they should be planted out like the seedlings.

*Forcing.—*Sea-kale may be forced in the open beds by the aid of sea-kale pots or covers, which arc contracted a little at top, with a movable lid. One of the earthenware covers, or an inverted flower­

pot, is placed over each plant, or each patch of plants, and leaves of trees are closely packed round the pots, and raised to about 1 ft. above them. When fermentation commences, the temperature within should not exceed 60° F. If the crowns are thus covered up by about the end of October, the crop may be cut by about the third week of December, and by starting a batch at various times a supply may be kept up till the middle of May.

Strong plants may also be taken up and planted on hotbeds, the sashes being kept covered close; or they may be set thickly in boxes as recommended for rhubarb, and placed in any heated structure, or in the mushroom house; but, to have the shoots crisp and tender as well as blanched, light must be completely excluded. Besides the common purple-leaved, there is a green-leaved sort, which is said to blanch better.

SEAL, strictly speaking the name of the common European representative of that group of marine carnivorous mammals constituting the suborder Pinnipedia of the order Carnivora, but in a wider sense used to designate all the members of that group, except the walrus. The common seal (*Phoca vitulina)* is the typical representative not only of that group (see Carnivora), but also of the family *Phocidae* and the subfamily *Phocinae,* and it is to this latter group that the present article is restricted.

Although seals swim and dive with the greatest ease, often remaining as much as a quarter of an hour or more below the surface, and are dependent for their sustenance entirely on living prey captured in the water, all the species frequently resort to sandy beaches, rocks or ice-floes, either to sleep or to bask in the sun, and especially for the purpose of bringing forth their young. The latter appears to be the universal habit, and the young seals—of some species at least—take to the water at

first very reluctantly, and have to be taught to swim by their parents. The number of young produced is usually one annually, though occasionally two. They are at first covered with a coat of very thick, soft, nearly white fur, and until this falls off they do not usually enter the water. This occurs in the Greenland seal *(Phoca groenlandica)* and the grey seal *(Halichoerus grypus}* when from two to three weeks old, but in the common seal the change takes place either *in utero* or at birth. The movements of the true seals upon the ground or ice are very different from those of the eared seals, or *Otariidae,* which walk and run upon all four feet, the body being raised as in the case of ordinary quadrupeds. The hind limbs (by which seals mainly propel themselves through the water) are on land perfectly passive, stretched backwards, with the soles of the feet applied to each other, and often raised to avoid contact with the ground. Sometimes the fore-limbs are equally passive, being placed close to the sides of the body; motion being then effected by a shuffling or wriggling action produced by the muscles of the trunk. When, however, there is necessity for more rapid progress, the animals