Order 2.—Decapoda.

(Table-cases Nos. 9–16.)

The gills are arranged typically in three series—podobranchiae, arthrobranchiae, and pleurobranchiae. Only in the aberrant genus *Leucifer* are the gills entirely absent. The first three pairs of thoracic limbs are more or less completely modified to act as jaws (maxillipeds), while the last five form the legs.

This very extensive and varied Order includes all the larger and more familiar Crustacea, such as Crabs, Lobsters, Crayfish,

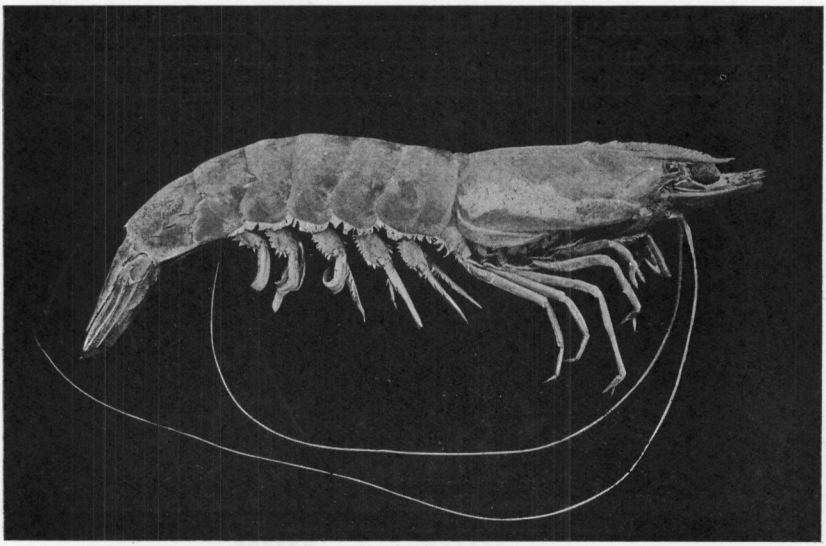

Fig. 30.

Penaeus caramote, from the side, about half natural size.
[Table-case No. 9.]

Prawns, and Shrimps. From their greater size and more general interest, it is both possible and desirable to exhibit a much larger series than in the other groups of Crustacea, and in Table-cases Nos. 9 to 16 will be found representatives of all the Tribes and of the more important families composing the Order. On the system of classification adopted here, these tribes are grouped under three Sub-orders :—

Sub-order 1.—Macrura.
,, 2.—Anomura.
,, 3.—Brachyura.

Sub-order I.—MACRURA.

(Table-cases Nos. 9–11.)

The Macrura are generally distinguished by the large size of the abdomen, which is symmetrical and not folded under the body. The front, or rostrum, is not united with the "epistome." The sixth pair of abdominal appendages (uropods) are always present, generally broad and flattened, forming with the telson, a "tail-fan."

The first Tribe of the Macrura, the Penaeidea, consists of prawn-like animals having the first three pairs of legs usually chelate or pincer-like, and not differing greatly in size. The side-plates of the second abdominal somite do not overlap those of the first. Members of this Tribe are the commonest Prawns in tropical seas, and often reach a great size. *Penaeus caramote* (Fig. 30) is highly esteemed for the table in Mediterranean countries, and many other species are used for food in various parts of the world. *P. caramote* is stated to have occurred on the Welsh coast. *Leucifer*, a delicate, transparent, pelagic form, belonging to this tribe, differs from all other Decapoda in having no gills.

The small Tribe of the Stenopidea includes a few forms which resemble the Penaeidea and the Astacidea in having the first three pairs of legs chelate, but differ from them, among other characters, in the fact that the third pair is much the largest. *Stenopus*, a common tropical genus, is remarkable for the brilliant coloration of the living animals. The specimen of *S. hispidus* exhibited here has been painted so as to convey some impression of this.

The Tribe Caridea includes the true Prawns and Shrimps. The first two pairs of legs are generally chelate or pincer-like, and the first is seldom larger than the second. The second somite of the abdomen has the side-plates broadened, so as to overlap those of the somites in front and behind.

Only a few of the numerous families composing this tribe are illustrated by the specimens exhibited.

The members of the family *Acanthephyridae* are deep-sea animals, and possess many primitive characters. Like some of the related families, they have swimming branches (exopodites) on the legs. Some of them are phosphorescent.

The *Nematocarcinidae* are also inhabitants of the deep sea, and are remarkable for the extreme length and slenderness of

the legs, well shown by the specimen of *N. undulatipes* (Fig. 31) from the *Challenger* Expedition, which is exhibited here.

The *Pandalidae* have the first pair of legs slender and ending in pincers so minute that, to the naked eye, the limbs appear simply pointed. The second legs have the carpus, or " wrist," divided into small segments. To this family belong the British *Pandalus montagui* (the " Pink Shrimp " of the fishmonger) and

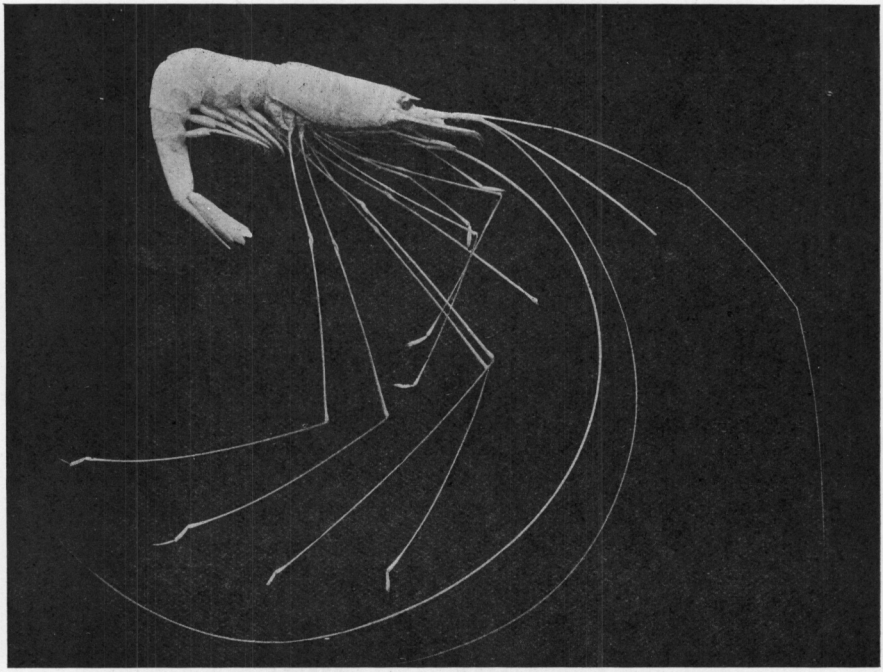

FIG. 31.

Nematocarcinus undulatipes. [Table-case No. 9.]

the much larger *P. borealis.* The latter inhabits the deeper waters of some of the Norwegian fjords, ranging from 60 to 400 fathoms depth. In recent years, as a direct result of investigations carried out by the zoologists of the Norwegian Fishery Department, an important fishery of this species has been established, and large quantities are now exported from Norway to the English and other markets.

In the family *Alpheidae* the pincers of the first pair of legs are

usually greatly enlarged and very dissimilar in shape. The second legs are slender, and have the carpus, or "wrist," divided into many small segments. The members of this family are very abundant in tropical seas, especially on coral reefs. Some of them produce a clicking noise by snapping the fingers of one of the chelae.

In the family *Palaemonidae* the first two pairs of legs end in chelae, or pincers; the second pair is larger than the first, and has the carpus, or "wrist," undivided. The antennules bear each three terminal filaments. To this family belong the common marine "Prawns" of British coasts and the "River Prawns" that are abundant everywhere in fresh waters within the tropics. The great size reached by some of the latter is shown by the

FIG. 32.

The common Prawn, *Leander serratus*, slightly reduced. [Table-case No. 9.]

specimens of *Palaemon carcinus* from the East Indies and *P. jamaicensis* from the West Indies. Attention may also be directed to a specimen of the common Prawn (*Leander serratus*) (Fig. 32) prepared by a special process so as to retain the translucency of the living animal.

In the family *Crangonidae* the pincers of the first pair of legs are imperfectly formed (sub-chelate) and much stronger than those of the second pair, which are very slender. The rostrum is usually short and flattened. To this family belong the common Shrimp (*Crangon vulgaris*) and the large Arctic Shrimp (*Sclerocrangon boreas*).

The Tribe ASTACIDEA (or NEPHROPSIDEA) includes the true Lobsters and Crayfishes. They may be recognised by having the first three pairs of legs chelate or pincer-like, and the first pair very large.

The Lobsters constitute the family *Homaridae*, all the

members of which inhabit the sea. The last thoracic sternum is firmly fixed to the preceding, and the male has sexual appendages on the abdomen.

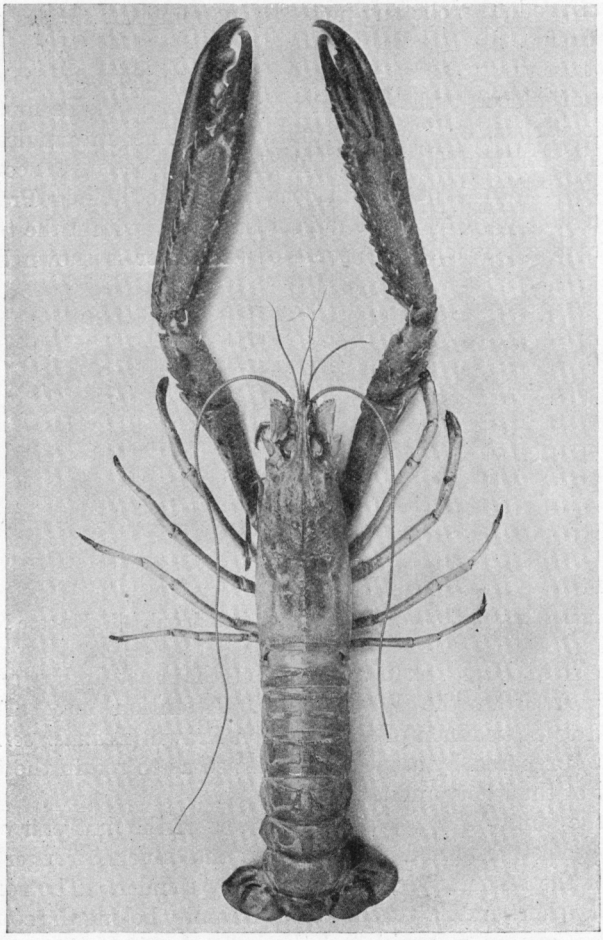

FIG. 33.

The "Norway Lobster," *Nephrops norvegicus*. Length, from head to tail, 7½ inches. [Table-case No. 10.]

The common Lobster of Europe, *Homarus gammarus*, is represented on the American coasts of the North Atlantic by a closely allied species, *H. americanus*. A third species, *H. capensis*, is

found at the Cape of Good Hope, but it is of small size and of no economic importance. A series of specimens and drawings in Wall-cases Nos. 1 to 3, illustrating the structure and life-history of the Common Lobster, have already been described. The "Norway Lobster," *Nephrops norvegicus* (Fig. 33), is found abundantly in certain localities in deeper water than that frequented by the Common Lobster. It is generally sold in London shops under the name of "Dublin Prawn," although the chief supplies now come from Scotland and the North-East of England, not, as formerly, from the Irish Sea. In connection with the name "Norway Lobster" used for this species, it should be remembered that the common Lobster is abundant on the coasts of Norway, and that large quantities are exported thence to England.

In the true Crayfishes, which belong to two families inhabiting respectively the fresh waters of the Northern and Southern Hemispheres, the last thoracic sternum is movable. In the Northern Crayfishes, belonging to the family *Astacidae*, the male has sexual appendages on the abdomen.

The largest of the Crayfishes found in Western Europe, and the most highly esteemed for food, is the "Red-clawed Crayfish," *Astacus fluviatilis* (French, "Écrevisse à pattes rouges," German, "Edelkrebs"), found in France, Germany, Austria, N.W. Russia, S. Sweden, Denmark, &c. Although the name *A. fluviatilis* is sometimes applied to the English Crayfish, it is more correctly restricted to the Red-clawed species, which does *not* occur in the British Islands.

The "White-clawed Crayfish," *Astacus pallipes* (French, "Écrevisse à pattes blanches," German, "Steinkrebs"), is found in England and Ireland, France, South Germany, Italy, &c. It is little used for food, being regarded as much inferior to *A. fluviatilis*.

Astacus leptodactylus is a large species found in the Lower Danube and its tributaries, and in Russia, especially in those rivers that flow into the Black Sea and the Caspian. It is occasionally used for the table, but is regarded as inferior in quality.

In North America, east of the Rocky Mountains, numerous species of crayfish of the genus *Cambarus* are found. A few of these live in the subterranean waters of caves, and, like many other subterranean animals, are blind. The best known species is *Cambarus pellucidus*, from the Mammoth Cave in Kentucky, of which a specimen is exhibited.

In the Southern Crayfishes, forming the family *Parastacidae*, there are no sexual appendages in the male. Numerous species of this family occur in Australia, and *Astacopsis spinifera*, known as the "Murray River Lobster," is used for food. Like the closely allied *A. franklinii* (Fig. 34) of Tasmania (of which a specimen is exhibited in Wall-case No. 5), it sometimes grows to a great size. The occurrence of *Astacoides madagascariensis* on the island of Madagascar is remarkable, since no Crayfishes are found anywhere on the African continent.

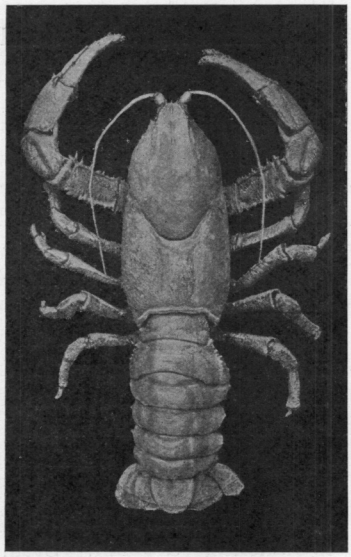

FIG. 34.

Astacopsis franklinii, about $\frac{1}{7}$th natural size. [Wall-case No. 5.]

The members of the tribe LORICATA (or SCYLLARIDEA) are large, lobster-like Crustacea. They may be distinguished from the true lobsters by having no chelae (the last pair of legs only are imperfectly chelate in the female). In the family *Palinuridae* the body is more or less cylindrical, and the antennae are long, cylindrical and jointed, while in the *Scyllaridae* the body is more or less flattened, and the antennae are expanded into broad plates, which are said to be used as shovels in burrowing. To the former family belongs the Spiny Lobster or Sea Crawfish (French, "Langouste"), *Palinurus vulgaris* (Fig. 35), which is