

Text-figure 61.

Variation in the average carapace length of catches of *Parapandalus richardi* made at 100 fathom intervals.

Family *Physetocaridae*, fam. nov.

Rostrum present as a broad prolongation of the carapace. First pereopods simple. Second pereopods chelate, with the carpus segmented. No exopods on the third maxillipeds or any of the pereopods. Terminal joint of the second maxillipeds not applied as a strip to the end of the preceding joint. Mandible without an incisor process or palp.

Genus *Physetocaris*, gen. nov.

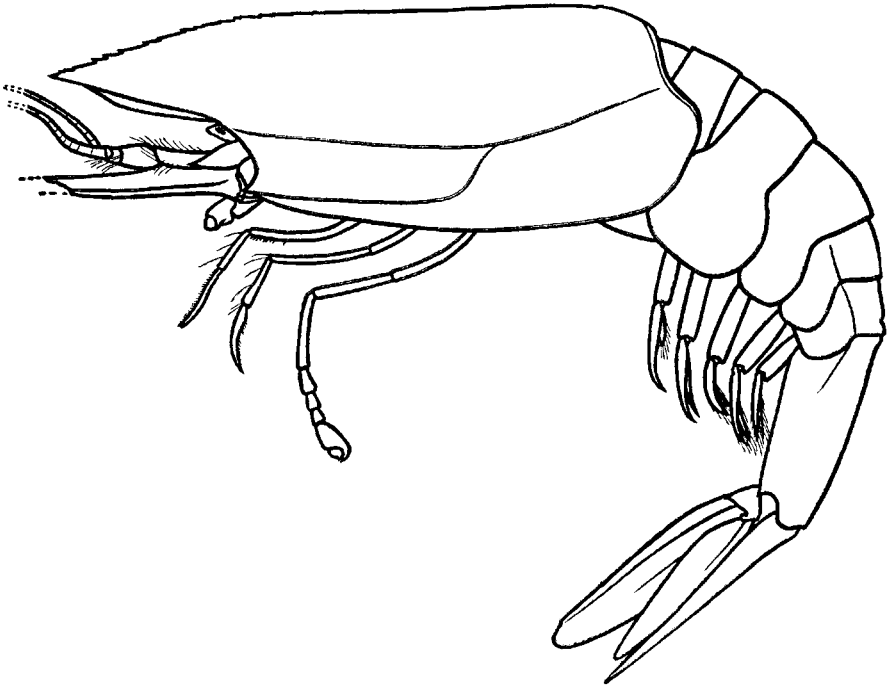
Carapace greatly inflated. Carpus of second pereopods consisting of four segments; chela flattened with a very short, broad dactyl. Branchial formula as follows:

	VII	VIII	IX	X	XI	XII	XIII	XIV
Podobranchiae	ep.	ep.	ep.	ep.	ep.	ep.		
Arthrobranchiae								
Pleurobranchiae				1	1	1	1	1

Physetocaris microphthalmia, sp. nov.

Text-figs. 62 and 63.

Types: Holotype female (?) Cat. No. 30,523, Department of Tropical Research, New York Zoological Society; Net 798; July 15, 1930; 600 fathoms.



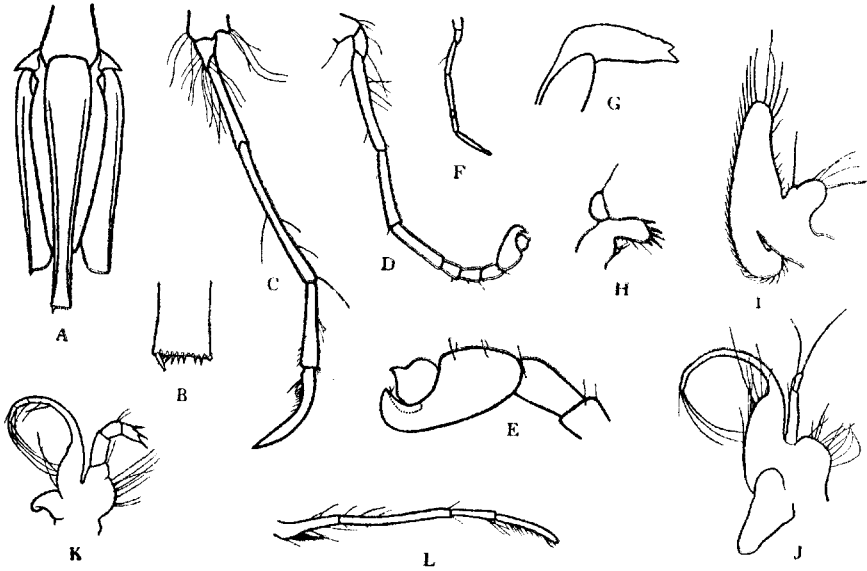
Text-figure 62.

Phisetocaris microphthalmus. Holotype. $\times 6.00$.

One female (?); Net 983, 990, 997, 1003, 1014, 1015, 1016, 1102, 1108, 1115, 1121, 1131, 1137 (?), 1138 (?), 1144, 1149 or 1150; June 2 to August 8, 1931; 500 fathoms.

Diagnosis: Carapace with two lateral carinae. Abdomen without any dorsal carinae or spines. Telson deeply sulcate dorsally and broadly truncate at the tip. Eyes very small and set on outside of stalks.

Description: Integument extremely thin and fragile. Carapace markedly inflated dorsally and anteriorly to form a very broad, inflated rostrum. The dorsal margin is carinate for its entire length and minutely denticulate on the anterior third of its length. In addition to the dorsal carinae there is a lateral carina originating behind the eye, which passes backward and slightly downward for about three-fifths of its length and then turns upward and terminates just before reaching the hind margin of the carapace. A second lateral carina starts at the branchiostegal spine, runs backward nearly parallel with the first for about half the length of the carapace, then turns upward and joins the first carina at the point where the latter bends upward. Orbit not defined, the raised line bordering the lower lateral margin of the rostrum forming a smooth curve and terminating in the prominent branchiostegal spine. Abdomen without any dorsal carina or spine on any somite, the only ornamentation being a raised ridge at the junction of the terga and pleura on the fourth and fifth somites; this ridge also extends onto the anterior part of the sixth somite. The sixth somite is about three and one-half times as long as the fifth. Telson longer than the sixth somite, deeply sulcate dorsally and broadly truncate at the tip where it is armed with a row of ten small spines, the outermost pair being about twice as long as the eight central ones. In the holotype, the tip of the telson is slightly concave rather



Text-figure 63.

Phyetocaris microphthalmus. **A.** Telson and uropods. **B.** Tip of telson. **C.** First pereopod. **D.** Second pereopod. **E.** Chela of second pereopod. **F.** Fifth pereopod. **G.** Mandible. **H.** First maxilla. **I.** Second maxilla. **J.** First maxilliped. **K.** Second maxilliped. **L.** Third maxilliped.

than nearly straight as in the paratype (Text-fig. 63 B). Eyes small and nearly hidden beneath the rostrum; the minute cornea is set at the antero-external angle of the stalk so that the latter extends beyond the cornea. Stylocerite is a broad, fleshy lobe of the first segment of the antennular peduncle and its outer spine reaches about to the distal third of that segment. Antennal scales damaged in both specimens; there is a small spine on the peduncle at the base of the scale. First pereopod with a sickle-shaped dactyl. Second pereopod with the carpus divided into four joints, the first of which is nearly as long as the combined length of the other three; chela flattened and provided with a curious, broad dactyl (Text-fig. 63 E). Third and fourth pereopods missing. Fifth pereopod reduced and simple (Text-fig. 63 F). The mouth parts are shown in Text-fig. 63 G-L. The mandible lacks both an incisor process and a palp and the remaining mouth parts are correspondingly reduced. The first three segments of the second maxilliped are more or less fused and the terminal segment bears three prominent spines and is applied normally to the end of the preceding joint.

Measurements: Carapace of holotype, measured from the base of the eyestalk, measures 9.2 mm. The paratype is somewhat smaller, having a carapace length of only 6.2 mm.

Color in Life: Carapace translucent white over a deep red organ (possibly ovaries). Abdomen scarlet with red at the base of the pleopods.

Remarks: In the absence of adult males or ovigerous females it is, of course, possible that this prawn may be a larval form. The fully developed appendages and lack of exopods do not bear out this possibility, however. Whether it is a larval stage or not, its systematic position is extremely obscure. It has been impossible to accommodate it in any known caridean family and even its relative position among the established families is un-

certain. There is little doubt that it is one of the most specialized bathypelagic carideans known, and it apparently shows affinities with the Processidae and the Cragonidae as evidenced by the reduced gill structure, the form of the mandibles and other mouth parts, the simple first pereopods (as in one of the first legs in *Processa*) and the multiarticulate carpus of the second pereopods. The chela of the second pereopod is unlike that found in any other caridean except possibly that on the first pereopod in the genus *Discias*; obviously, however, its relation to *Discias* is remote.

GENERAL DISCUSSION AND SUMMARY.

Taxonomy: The name of the family to which the largest number of bathypelagic carideans belong has been the cause of considerable confusion; at various times it has been known as the *Oplophoridae*, *Ephyridae*, *Miersiidae* and *Acanthephyridae*. Although the latter name, which I have employed previously, seems the more suitable, it now appears advisable to use the name *Oplophoridae* since Kingsley's use of the subfamily name *Oplophorinae*, in 1878 and 1879, antedates all others and logically proposes *Oplophorus* as the type genus, even though Kingsley originally erected the subfamily to include *Oplophorus elongata* (= *Xiphocaris elongata*, an atyid). In 1879 (p. 416) he proposed *Ephyrinae* as a subfamily of the *Atyidae*, whereas his *Oplophorinae* (p. 426) was included in the *Palaemonidae*. *Ephyra*, the type genus of the *Ephyrinae*, was proposed by Roux, 1831, for the type species, *Alpheus pelagicus* Risso, 1816, and later replaced with *Miersia* by Kingsley, 1879, since Roux's name was preoccupied. *Miersia pelagica* is apparently unknown to modern carcinologists, but it seems not unlikely that Risso's species may be the same as the form now known as *Acanthephyra pulchra* A. Milne Edwards, 1890. Risso's crude figure is obviously incorrect as regards the form of the rostrum, and there is nothing in the description which would not apply equally well to *A. pulchra* except that all of the abdominal somites are said to be sharply carinate and no mention is made of the presence of exopods on any of the pereopods. Even if these discrepancies are overlooked, however, Risso's description can never be used with any certainty and, since the type is probably not extant, the best procedure seems to be to discard *Ephyra* and *Miersia* entirely and use the name *Oplophoridae* for the family as it is known today.

There has also been some difference of opinion as to the proper spelling of the name of the type genus. The correct transliteration is, of course, *Hoplophorus*, but even though the aspirate is seldom if ever used in modern French and so might well have been overlooked by Milne Edwards, there is no choice under the present rules of nomenclature but to preserve the original orthography, *Oplophorus*, as proposed by the original author.

It is likely that future investigations will reveal that the systematics of the *Oplophoridae* as known at present are very inadequate. *Systellaspis* and *Oplophorus* are more or less well defined genera and there is little likelihood of confusing the species of those genera with any other. Likewise, the more typical members of *Acanthephyra* cause little trouble, but the line of division between *Acanthephyra* and the three other genera, *Hymenodora*, *Notostomus* and *Ephyrina*, is not sharply defined. Although there is little chance of confusing the species of *Hymenodora* with those of *Acanthephyra*, it is difficult to find any character of systematic importance for distinguishing the two groups. The reverse is true of the division between *Acanthephyra* and *Notostomus*; it is almost impossible to assign species like *Acanthephyra gracilipes* and *Notostomus compsus* to the proper genera at a glance, but the form of the mandible reveals a good diagnostic character. The genus *Notostomus*, as here defined, is a very heterogeneous group. It may be necessary at some future date to split off the species of the *N.*

vescus group under the inappropriate name, *Meningodora*. Possibly this group, even as known at present, deserved at least subgeneric recognition, but I have not made this distinction because of the way in which the gap between the two groups is filled by such species as *N. mollis* and *N. distirus*. *Ephyrina* is another easily recognizable genus which exhibits no character of great systematic importance to separate it from *Notostomus*; the form of the mandibles and the presence of a lateral ridge on the carapace ally it so closely to *Notostomus* that the broadened form of the pereopods is the only distinctive character separating it from that genus. *Notostomus*, then, is the genus which causes the greatest trouble; it is made up of about fifteen species at present and more are being found by nearly every expedition. Until our knowledge of this genus is more nearly complete, it is probably advisable to follow the systematic scheme already established for the family.

Since so many of the bathypelagic Caridea belong to relatively primitive groups, it is surprising to find such a highly evolved new form as *Physetocaris* in such a habitat. Although this animal appears to be one of the most specialized carideans known, as evidenced by the absence of exopods, the reduced gill series, the simplified mouth parts and the jointed carpus and complex chela of the second pereopods, it has apparently been able to assume a pelagic mode of life by adding to its buoyancy by means of a membranous integument and an inflated carapace.

Summary of Quantitative Results: The following table lists the species taken during the expeditions, arranged according to the number of adult specimens procured.

Species	Adults	Young
<i>AcanthePHYra purpurea</i>	1705	2867
<i>Systellaspis debilis</i>	1037	912
<i>Parapandalus richardi</i>	361	43
<i>Hymenodora gracilis</i>	279	1550
<i>Notostomus miccyclus</i>	120	25
<i>Notostomus vescus</i>	78	74
<i>AcanthePHYra haeckelii</i>	71	146
<i>Parapasiphaë sulcatifrons</i>	36	461
<i>AcanthePHYra stylostrata</i>	32	54
<i>Oplophorus grimaldii</i>	27	21
<i>Notostomus mollis</i>	12	44
<i>Notostomus robustus</i>	9	11
<i>Leptocheila bermudensis</i>	8	8
<i>Notostomus marptocheles</i>	6	9
<i>Ephyrina bifida</i>	5	65
<i>Notostomus compsus</i>	3	—
<i>Parapasiphaë macrodactyla</i>	2	28
<i>Systellaspis braueri</i>	2	11
<i>Pasiphaea hoplocerca</i>	2	5
<i>Notostomus distirus</i>	2	—
<i>Lucaya bigelowi</i>	2	—
<i>Physetocaris microphthalmia</i>	2	—
<i>Oplophorus spinicauda</i>	1	8
<i>AcanthePHYra brevirostris</i>	1	5
<i>Pasiphaea liocerca</i>	1	—
<i>AcanthePHYra gracilipes</i>	1	—
<i>AcanthePHYra</i> , sp. ?	—	8
<i>AcanthePHYra eximia</i>	—	3
<i>Parapasiphaë</i> , sp. b.	—	2
<i>AcanthePHYra acutifrons</i>	—	2
<i>Notostomus westergreni</i> ?	—	2
<i>Parapaisiphaë</i> , sp. a.	—	1
<i>AcanthePHYra curtirostris</i>	—	1
<i>Notostomus perlatus</i> ?	—	1
<i>Ephyrina hoskynii</i>	—	1
<i>Plesionika martia</i>	—	1

Acantheephyra purpurea and *Systellaspis debilis* are by far the commonest species in this area but even these species, at the levels at which each was most abundant, were captured at the average rate of only one adult for every 1.7 and 2.1 hours of towing respectively. In the case of the tenth species in the list, *Oplophorus grimaldii*, 39 hours of towing were required for every adult specimen taken at 300 fathoms, the optimum level for that species in the daytime. A one meter net is far from being perfectly efficient in straining a one meter column of water, but if the assumption of 100 per cent. efficiency is allowed and if the nets are drawn through the water at the rate of one knot, which is probably conservative, these results would indicate an average concentration of the commonest caridean, *Acantheephyra purpurea*, of one adult in every 88,269 cubic feet of water at 700 fathoms which is the optimum level for that species. This gives some indication of the rarity of many of the species toward the end of the above list. Several are probably only accidental strays into this region from some other oceanic area, but the total results of all past expeditions seem to indicate that certain bathypelagic species are everywhere very rare. It is unwise, however, to make such general statements when one realizes how little of the volume of the sea has been investigated. Many species, now considered rare, may prove to be relatively common when their center of concentration is discovered. This point is clearly emphasized by the fact that the fifth species in order of abundance in the Bermuda area, *Notostomus miccyclus*, was previously unknown.

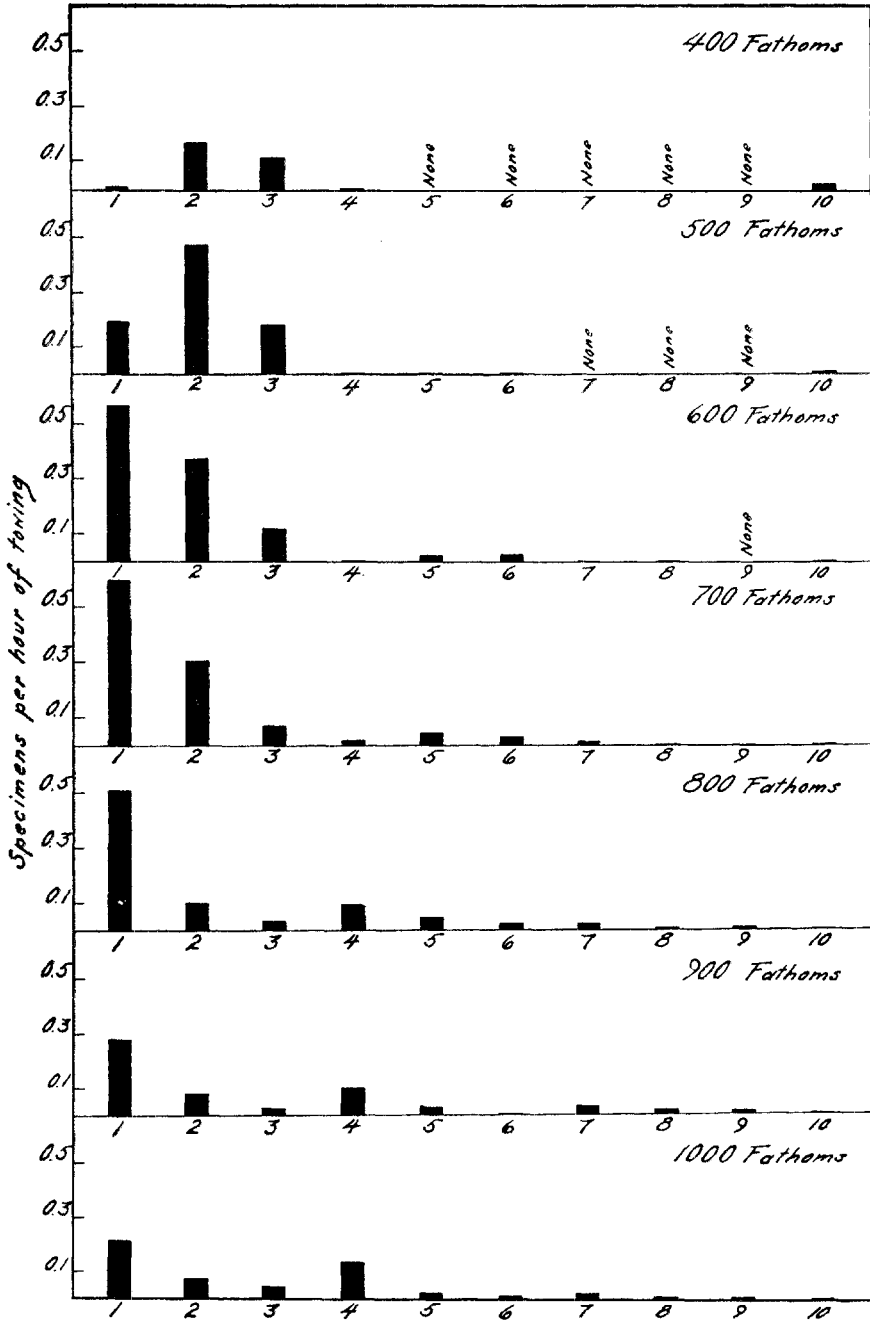
Text-fig. 64 may be useful in picturing the relative abundance of adults of the ten commonest species in the Bermuda area at each level from 400 to 1,000 fathoms. The fact cannot be stressed too strongly that this graph is applicable only to the particular region in which this work was done, or at most to the Sargasso Sea. During the course of several cruises of *Atlantis* of the Woods Hole Oceanographic Institution to the Sargasso Sea and to waters off the continental shelf to the west and north of the Gulf Stream, species common to both areas were found in much greater depths in the Sargasso area than on the coastal side of the Stream.

One of the interesting but unexplainable points brought to light by the collection is the change in the ratio between the sexes of certain species with an increase in depth. In both *Acantheephyra purpurea* and *Hymenodora gracilis*, males were proportionately more numerous near the lower limits of their range than they were nearer the surface. On the other hand, in two other species which were represented by an equally large number of specimens, *Systellaspis debilis* and *Parapandalus richardi*, no such change in the sex ratio was found. Whether the females of the first two species are for some reason more buoyant than the males or whether the phenomenon has some more involved explanation can hardly be decided at present. The logical conclusion that females with eggs are found nearer the surface is not confirmed by this material.

As practically all of the tows were made in the daytime, the collection fails to increase our knowledge of the diurnal vertical migration of these forms. Only in the case of *Leptocheila bermudensis* was there evidence of diurnal migration. Although the number of specimens involved was small, this species was found at the surface in the evening but only at 400 and 700 fathoms during the daytime.

No definite evidence of any seasonal distribution could be discovered, with the exception of *Parapandalus richardi* (see remarks on seasonal distribution under that species). In all other cases where significant numbers of specimens were available, no seasonal fluctuation of any sort could be detected over the period in which towing was done. Oviparous females of most species were taken in every month from April to September.

Geographical Distribution: As noted above, that portion of the sea through which nets have been drawn is extremely small and our knowledge



Text-figure 64.

The vertical distribution of adults of the ten commonest species of bathypelagic Caridea in the Bermuda area during the daytime. 1. *AcanthePHYra purpurea*. 2. *Systellaspis debilis*. 3. *Parapandalus richardi*. 4. *Hymenodora gracilis*. 5. *Notostomus miccyclus*. 6. *Notostomus vascus*. 7. *AcanthePHYra haeckelii*. 8. *Parapasiphaë sulcatorons*. 9. *AcanthePHYra stylorostrata*. 10. *Oplophorus grimaldii*.

of oceanic barriers to the dispersal of bathypelagic organisms is correspondingly inadequate. From such distributional data as are available at present, it is obvious that the temperature and chemical composition of the sea have a much greater effect on the dispersal of such species than have any land barriers. Probably, then, oceanic currents will be found to delimit faunistic zones in the ocean depths much as do mountain ranges, deserts and bodies of water on land. In most cases, it is certainly misleading to define the limits of pelagic organisms on the basis of parallels of latitude and longitude. In reviewing the known distributions of the species of Caridea found off Bermuda, I have been forced to employ the more or less arbitrary regions listed below. These areas are actually regions in which more or less extensive investigations of the bathypelagic fauna have been carried on and if any of them also represent definite oceanic faunistic regions it is largely accidental. The following is a list of the zones from which species taken by the Bermuda Expeditions have been recorded previously, with the figures in parenthesis representing the numbers of species common to both those areas and to Bermuda.

- Sargasso Sea (4)
- North Atlantic (north and west of the Gulf Stream) (6)
- Off the coasts of Ireland (5)
- Eastern North Atlantic (Bay of Biscay to Cape Verde Ids.) (11)
- Mediterranean Sea (2)
- Bahamas and the West Indies (9)
- Equatorial Atlantic (11)
- South Atlantic (2)
- Off the Cape of Good Hope (6)
- Indian Ocean (15)
- Malay Archipelago and Philippine Ids. to Japan (9)
- South Pacific (4)
- Hawaiian Islands (5)
- Eastern Pacific (California to Peru) (6)

In many instances this list is no more than a key to the amount of exploration carried on in each of these zones; there is little doubt that additional towing in the West Indian region and in the equatorial Atlantic will reveal more forms found also at Bermuda. The small number of species previously known from the Sargasso Sea is due entirely to the lack of reports on that area, but there is an indication that the Sargasso fauna extends well to the east in the region of the Bay of Biscay and off the coast of Africa; several forms found both in that area and off Bermuda have not been recorded from north and west of the Gulf Stream or off the coasts of Ireland. The one striking fact illustrated by the list is the unimportance of distance or land barriers when dealing with the distribution of pelagic animals; even though the number of species may have been proportionately increased by the amount of deep-sea work carried on there, the fact that no less than fifteen of the twenty-five species from Bermuda, which had been described heretofore, are also found in the Indian Ocean should be of particular interest to the student of zoögeography.

Color of Bathypelagic Caridea: So much has been written on the color of deep-sea Crustacea that there is little necessity for reviewing the subject here. The excellent color notes on the Bermuda material supplied by Miss Crane reaffirms the well established fact that most bathypelagic prawns are of some shade of red in life. All of the species of *Acanthephyra* in which the color was noted, as well as *Pasiphaea liocerca*, *Parapasiphaë sulcatifrons*, *Notostomus robustus*, *Hymenodora gracilis* and *Systellaspis debilis*, have the body entirely scarlet or scarlet-red. Certain of the species of *Notostomus* of the *N. vescus* group have the abdomen scarlet but the carapace much deeper in color, at times nearly black. *Lucaya bigelowi* is unique in being pale salmon in life. There is another group of species, many of which are found relatively near the surface, in which the scarlet coloring

is reduced to patches or even to isolated chromatophores. This tendency is noted in *Notostomus miccylus* and *Parapandalus richardi* which have the carapace evenly scarlet but the abdomen, especially in immature specimens which frequent shallower depths, heavily splotched with scarlet. The same condition is noted in young specimens of *Systellaspis debilis*, and even in mature specimens of this species which have not attained their maximum size the uropods are often transparent. In *Leptochela bermudensis*, *Oplophorus spinicauda*, *Oplophorus grimaldii* and *Plesionika martia*, all of which may be found relatively near the surface, the entire animal is more or less transparent with scattered scarlet markings or dots. Specimens of *Leptochela bermudensis* which were kept alive for some time after their capture showed a slight deepening of color after several hours; it is not inconceivable that some species undergo a certain amount of color change depending upon the amount of light to which they are exposed.

Luminescence: Four of the bathypelagic Caridea of the Bermuda area are shown to be luminescent from notes made on living material; these species are *Leptochela bermudensis*, *Systellaspis debilis*, *Oplophorus spinicauda* and *O. grimaldi*. All of these forms apparently possess photophores, or dermal light organs of a definite structure, although this conclusion could not be substantiated in *Leptochela bermudensis*. Only from this latter species, however, could luminescence of the photophore type be produced. To my knowledge, the photophores of captured specimens of *Systellaspis debilis* have never been seen to emit light, but that such is their function can hardly be doubted, and Beebe (1934, p. 304) records the following observation made from the bathysphere, "Again, one good-sized shrimp at 1300 feet had six or eight scattered lights, and one long, slit-like light near the center of its body, which identified it with almost complete certainty as *Systellaspis debilis*." Although the presence of a transverse, slit-like organ does not necessarily prove that the species observed was *S. debilis* since several oplophorids have similar photophores behind the fifth pereopods and those in *Oplophorus grimaldii* are very like the comparable organs in *S. debilis*, these observations lend further assurance that these types of photophores are functional light organs. During one of the cruises of *Atlantis* to the Sargasso Sea, *S. debilis* was obtained in considerable numbers and it was possible to keep them alive for at least a week by refrigeration, but all attempts to shock them into producing light were futile. Similar experiments tried on living material of *Oplophorus spinicauda* and *Oplophorus grimaldii* from the present collection were likewise negative. One of the theories advanced to explain the function of these light organs suggests that they are used as specific recognition signs to enable individuals to find specimens of the opposite sex of the same species. Is it not possible, if such is the explanation, that the ability to produce light may be controlled by the ripening of the eggs and sperm? This would greatly reduce the likelihood of seeing the photophores light up in any given specimen. Since these animals can be obtained in considerable numbers in the Bermuda area and since they can be kept alive and apparently healthy for some length of time by regulating the temperature of the water, it is to be hoped that this theory may be checked in the near future.

Another type of luminescence noted in bathypelagic Caridea is the production of the so-called "luminous cloud." This appears to be a purely defensive mechanism whereby a prawn, when startled, can emit a cloud of luminous material from some internal gland. This spectacle was seen in *Systellaspis debilis* and *Oplophorus spinicauda* (see notes under that species) among the Bermuda material. Dr. Beebe assures me that this phenomenon was repeatedly observed in specimens of the former species and has very kindly provided me with a photograph of a specimen which had been seen to emit such a cloud; there is no doubt that it belongs to this species. Miss Crane has also observed that on many occasions when specimens of this species were placed in alcohol, a mass of flocculent material was immediately

ejected. On several occasions this was tested in the dark-room and found to be fluorescent. Curiously enough, Miss Crane has also noted the presence of this flocculent material when specimens of *Acantheephyra* were put in preservative.

Dr. Beebe (1934, p. 304) records as follows the results of his observations on this subject made during descents of the bathysphere: "Whereas the photophore-like organs of euphausiids may serve chiefly as recognition marks, or other non-defensive capacities, the luminous matter [of large, *Acantheephyra*-like shrimps] was obviously discharged only when a shrimp was startled, as when it bumped against the bathysphere window. When this happened, a rocket-like burst of fluid was emitted with such violence that the psychological effect was that of a sudden explosion. This occurred time and again at the lower levels, and I learned to distinguish two separate types of discharge, one uniformly luminous, the other dimmer but interspersed with dozens of brilliant stars and pinheads. For an instant the shrimp would be outlined in its own light—vivid scarlet body, black eyes, long rostrum—and then would vanish, leaving behind it the confusing glow of fluid. The light died out gradually, but the discharge disappeared even more slowly. It was not until one of my last dives that I learned that certain grayish bodies which I had been reporting as unlighted fishes were in reality these burnt-out masses of fluid."

Dr. Harvey (1931) has discussed the chemistry of luminescence in *Systellaspis*.

Among the Ophlophoridae, luminescence apparently is found in but two genera, *Systellaspis* and *Ophlophorus*, where both photophores and luminous glands may be found in the same species, but the possibility can not be entirely ruled out that luminous glands may be found in other genera as well. More observations made directly from living material should be encouraged to increase our knowledge of the number of species which are luminescent. It is also helpful to preserve some of each species in formalin, for photophores which disappear in a few days in alcohol, will be distinct several years later in material put up in formalin. This recommendation is made with some reservation, however, for alcohol is much to be preferred to formalin as a general preservative.

Food of Bathypelagic Caridea: The following remarks on the food of *Acantheephyra purpurea* and *Systellaspis debilis* are based on such incomplete data that they are included here merely in the hope that other workers may be induced to investigate the problem more thoroughly. Miss Jocelyn Crane dissected out the stomachs of a dozen specimens of *Acantheephyra purpurea* and found them usually crammed with well digested food containing a few identifiable animals. Very much the same type of stomach contents were found in a few specimens of *Systellaspis debilis* which I dissected. In all but one or two cases, surprisingly large fragments of at least one blackish fish were found. Also present were various crustaceans ranging from copepods to comparatively large shrimp-like forms several species of pteropods; worms, some of which may have been parasitic; and radiolarians. The most striking point about these stomach contents was the size of the fragments. In some cases one fish apparently took up the entire space within the stomach and it was often so well preserved as to permit its generic determination. Several of the crustaceans could likewise be determined from the available pieces. Apparently, then, the mandibles do not necessarily crush the food into an amorphous mass before it is passed into the stomach.

One can only guess whether these prawns are able to capture their prey alive or whether they are purely scavengers which feed upon dead or dying organisms. It is very possible that much of the material found in the stomachs of these specimens was consumed after the specimens were in the net. When the contents of a net have been dumped into a tank of water immediately after being taken aboard ship, I have observed specimens of

Systellaspis debilis feeding with apparent enthusiasm upon dead fish as well as dead specimens of their own species. The fact that the stomachs of these prawns were usually distended with food when examined may be entirely due to the plentiful meal provided by the contents of the net and one cannot be certain that this food is representative of their normal diet.

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