

SABELLIDÆ AND SERPULIDÆ FROM JAPAN, WITH DESCRIPTIONS OF NEW SPECIES OF SPIRORBIS.

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In these PROCEEDINGS for 1903 was published a paper describing most of the Polychæta taken in Japanese waters and elsewhere in the North Pacific in the spring of 1900 by the U. S. F. C. steamer *Albatross*. The present paper is a continuation of that contribution, and is based on the same collections. A third part will some time deal with a number of species belonging to various families, the descriptions of which are withheld until some desirable comparisons can be made. Among the species previously described a considerable admixture of circum-boreal forms was found, most of them from the more northern stations. That none such is found among the Sabellidæ and Serpulidæ probably results from the fact that all of the species described in this paper came from the southeastern coast of Honshu, and especially from Station 3,707, on a sandy and gravelly bottom in Suruga Bay. Saint-Joseph's revision of these families was largely used as a guide in the generic references, but even with this help much difficulty was found in satisfactorily placing several of the species, and it will be noticed that some of them, and particularly *Sabella japonica* and *Pomatoceras auritubis*, depart widely from the generic types in some respects. In the enumeration of segments the collar setæ have been counted as belonging to the first of peristomial somite.

I take this opportunity to state that *Maldane coronata* and *Axiothea campanulata* of my former paper are synonyms respectively of *M. gotoi* and *Clymene harai* Izuka. Although Izuka's paper was published some months before mine it was not seen by me until after the correction of the final proofs.

Sabella japonica n. sp. (Pl. XI, figs. 1, 2; Pl. XII, figs. 39, 40.)

Without the branchiæ the type specimen has a length of 25 mm., of which the thorax takes 5 mm., and is 2.5 mm. in diameter; the detached branchiæ are 7.5 mm. long. A second specimen without branchiæ is 23 mm. long. As the branchiæ are detached some doubt attaches to them. They are much twisted, with 15 pairs of rather short, thick radioles slightly coiled inward at the ends; the barbs are

double-ranked, very close together, and have a nearly uniform length of 1.3 mm. to the end of the radioles. No eyes are visible. The second radiole from the dorsum of the right side terminates in a membranous vesicle which is probably pathological, but which would act much like the operculum of *Apomatus*. The branchial lobes are slightly involute ventrally. The collar is stiff and erect, separated by the entire width of the body dorsally, but prolonged ventrally as a pair of abrupt prominent narrow lobes in contact at the base. Except for very slight lateral emarginations the margin is entire. The thoracic region is nearly terete, the abdominal somewhat depressed and of a uniform width except at the tapering caudal end. There are 8 setigerous thoracic and 55 or 56 abdominal somites, mostly distinctly marked and uniannulate. Thick and very distinct ventral plates occupy the neural third of the body. Those of the thorax are twice as wide as long and undivided, except the first, or peristomial one, which is as wide as long and of a sugar-loaf shaped outline. The first abdominal plate is pentagonal, the others are divided into two equal squares by the faecal groove which is very distinct ventrally, but, after turning to the right in the furrow $^{IX}/_X$, and bending forward on IX, disappears totally on the side of the latter below the setæ. There is no trace of the dorsal groove. The setigerous and uncinigerous tori are strictly lateral and not elevated above the general surface of the body; the latter diminish in size caudally. The body cavity is filled with rather large eggs.

All of the setæ (Pl. XI, fig. 1) are of the winged capillary type, but differ considerably in length, slenderness and width of the wing. They are very nearly straight, very acute, and, although obliquely striated, the wings have entire margins. Both avicular and pick-shaped uncini occur on the thoracic, the former only on abdominal somites. Their number is always small—*e.g.*, 27 of each on III, 21 on VI, and 20 on VIII, while never more than 18 of the aviculæ only occur on abdominal somites. In both regions they rapidly diminish in size from the end of the tori nearest to the setæ, the smallest in the abdominal tori not exceeding $\frac{1}{3}$ the size of the largest. In the thoracic region the same statement applies to the pick-shaped hooks. The thoracic avicular uncini (fig. 39) have elongated bodies, about equalling the elevated neck and head, the posterior process slender and produced, and the breast small, but abrupt and strongly convex. The neck meets the body nearly at a right angle, is high and erect, and curves broadly and regularly into the stout tapering beak without any distinct enlargement into head or crest. The crest is represented by a fine striation near the vertex without any elevation or free teeth. The

sinus is very open with nearly straight parallel sides. On the abdominal somites these uncini (fig. 40) differ in the much reduced posterior process, the deeper, more sloping breast and the more wedge-shaped sinus. The figure is, however, somewhat foreshortened. The smaller uncini (fig. 2) have a peculiar form, which is transitional between the avicular and the usual pick-shaped uncini. The slender stem or body is bent strongly and slightly thickened, but lacks a distinct breast. The head is slightly enlarged with a very short, stout, slightly decurved beak and a prominent cap-like crest, much subdivided; from the base of the beak projects a slender angulated filament. In the form of the small uncini this species departs widely from the typical *Sabella*.

Suruga Bay, 3,707, 63-75 fms. Type and one other.

Potamilla acuminata n. sp. (Pl. XI, figs. 3-6; Pl. XII, fig. 41.)

This species is elongated and slender, a complete example having a total length of 56 mm., of which the branchiæ are 20 mm. and the thorax 5 mm., the diameter being 1.9 mm.

The branchiæ are more than $\frac{1}{3}$ of the total length, and when retracted into the tube are not at all or very slightly twisted and coiled. Two specimens have 19 radioles on the right, 17 on the left, the other having 15 and 16 respectively. They are straight, slender, of nearly uniform diameter, without eye-spots, and bear barbs nearly or quite to the tips in the dorsalmost radioles, but have a free end devoid of barbs and of considerable length in the ventral ones. Most of the radioles are provided with a short membranous wing on the inner side of the base, but there is no trace of a connecting web. The barbs have the usual biserial arrangement and equal or exceed the diameter of the body, with little diminution toward the distal end. The bases are entirely simple.

The collar is scarcely evident dorsally, but becomes prominent opposite to the dorsal setæ line, just below which is a barely distinguishable fold. On each side of the median ventral line is a broadly rounded, flat, somewhat thickened process, about as long as the first somite. In the retracted specimens these overlap medially. The entire ventral portion of the collar, except the ventral lobes, is extremely thin and delicate.

Between the bases of the branchiæ is a small rounded prostomial lobe, from which a broad folded membrane extends laterally around the mouth and joins the bases of the branchiæ. Connected with the inner side of the latter also are the so-called tentacles, consisting of a pair of processes about twice as long as the second somite, with the

leaf-like basal part folded longitudinally to form a groove, and the terminal $\frac{1}{2}$ attenuated.

The complete specimen has 8 setigerous thoracic and 68 abdominal somites. The body is nearly terete throughout and has a nearly uniform diameter, except at the posterior end. Anteriorly the parapodia are not at all elevated, but become rather prominent posteriorly. Except the peristomeum all somites have sharply defined ventral plates. In one specimen all, and in the others all but the first 8, are divided into 2 equal squares by a ventral groove. The pygidium has the form of a slightly oblique welt-like fold, which bounds the anus dorsally and laterally. The fecal groove is well-marked ventrally from the anus to the somite IX, on which it passes caudad of the ventral plate to the right and then bends sharply forward and passes obliquely anterior to the seta bundle to the dorsum, where it disappears.

All of the setæ and uncini are of a pale glistening yellow color and have the arrangement usual in the genus. The setæ of II are all of the winged capillary type, but differ in length, width of wing and degree of curvature or bending. The more slender and regularly curved ones are dorsal. The 7 succeeding thoracic somites bear both capillary in the dorsal and paddle-shaped setæ in the ventral part of the bundles. The former (fig. 3) have the characters just described, but the more ventral ones exhibit transitions toward the broad form in the tendency of the wing to widen and split into two divergent symmetrical plates. The two kinds are, however, always distinct. The paddle-shaped setæ (fig. 5) are arranged in a short, close phalanx. They have relatively stout, slightly tapering, striated stems, with the short, broad wings together forming a thin ovate expansion which tapers distally into a mucronate tip, whose length equals the greatest width of the blade and which is bent out of the plane of the latter. On the abdominal somites only capillary setæ (fig. 4) again occur, and in gradually diminishing number. The more slender, elongated, nearly wingless ones are usually paired with shorter broader ones.

On the thoracic segments the uncinigerous tori are flush with the surface of the body and bear the two kinds of uncini in parallel vertical rows, the avicula being anterior. On somite III there are 44 of each, on VI 32, and a further reduced number on VIII. The avicular uncini (fig. 41) have the slender posterior process and the erect portion equal and meeting at a right angle; the breast nearly hemispherical; the neck erect and straight; the beak moderately long, acute and straight, and inclined sharply downward with the lower margin parallel to the breast; the crest elevated and much subdivided, with about 5 distinct

teeth along the profile. The pick-shaped uncini (fig. 6) are more characteristic. They have slender, slightly curved stems, slightly increasing in diameter toward the distal end, and exceed the total length of the avicular uncini. The head is small, with a rounded back, and a short blunt beak, enclosed in a delicate and transparent hood, the base of which is often inflated, and the distal part prolonged at right angles to the stem into an exceedingly delicate and attenuated process, which, though varying considerably in length, always much exceeds the length of the head of the avicular uncini. The latter only occur on the abdominal somites, where they form short vertical series of from 12 to 18. Except that the upper outline of the breast is more sloping, they have exactly the form of the thoracic ones.

In the form of its setæ this species closely resembles *Sabella* (*Potamilla*?) *assimilis* McIntosh, but the pick-shaped uncini of that species have not been described. It was dredged by the *Challenger* in 600 fathoms off Buenos Ayres. It also agrees fairly well with the *Potamilla torelli* of Marenzeller and Langerhans, but not with Malmgren's original description.

The tube is circular and tortuous, of a tough cartilaginous consistency, covered evenly with very fine sand and has a clear line, evidently of attachment, along one side.

Sagami Bay, 3,698, 153 fms., 2 specimens and fragments of a third, with tubes.

Hypsicomus lyra n. sp. (Pl. XI, figs. 7-13; Pl. XII, fig. 42.)

The type is very long and slender, having a total length of 84 mm., the thorax 6 mm. and the gills 20 mm.; the diameter is 1.6 mm.

As seems to be usual in the genus, the basal lobes of the gills are quite prominent, about equalling the length of the first 3 somites, and their somewhat membranous dorsal and ventral margins overlap in the middle line. The distal end is strictly transverse and even, so that the radioles all arise from the same level. The radioles are long, slender, straight, not winged, and united by a web for the basal $\frac{1}{6}$. The double-ranked barbs are very numerous, slender and long, their length about equalling the diameter of the body, but diminishing somewhat before the short, naked tip of the radiole is reached. A conspicuous zone of reddish-brown eye-spots occupies about the third $\frac{1}{10}$ of the branchiæ, though they exhibit much irregularity in arrangement, and seldom occupy this entire distance on individual radioles. Each radiole bears a series on each outer margin, but the number varies from 5 to 20 or more, and they may be widely separated, much crowded or

even coalesced. They also vary much in size, and the two series on a radiole are seldom symmetrical.

The collar is simple, cleft, but in contact and slightly inturned dorso-medially. The dorsal half is low, of an even height, and has a slightly wavy margin. The ventral half rises very gradually to the apex of the triangular lobes which nearly meet in the middle line but diverge distally. There are no lateral incisions.

A pair of prominent tentacles are united with the middle of the inner face of the undivided base of the palpi. They rise freely to a length exceeding that base, and consist of a foliaceous proximal $\frac{1}{3}$, and a narrow ligulate distal $\frac{2}{3}$. Besides these a pair of minute processes occur side by side on the middle of the head disk, and probably represent the true prostomial tentacles.

The 174 to 184 somites, of which 8 are thoracic, form a slender, elongated body, terete anteriorly, but very strongly arched above and with a sole-like ridge formed by the ventral plates in the posterior part. The lozenge-shaped anus is situated in a small pygidium. In the thoracic region the segments are longer and distinct; in the abdominal they are very short and posteriorly much crowded. Here the body walls are very thin and distended by the well-filled intestine. The ventral plates of the thoracic region are not elevated above the general surface, but occupy the entire area between the tori. They are separated from each other by deep transverse grooves, and the first from the peristomial collar by a deep brown or black, apparently chitinous line. The first is about 4 times as broad as long, the second 3 times, and the others not over $1\frac{1}{2}$ times. The first abdominal plate is about $\frac{2}{3}$ as long as the last thoracic, the second is polygonal, and the others become successively shorter to the caudal end and form a deeply pigmented, narrow, sole-like ridge, divided from the anterior margin of the third one to the anus by the faecal groove. The faecal groove divides the ventral plates continuously to the posterior margin of somite X, around which and IX it passes obliquely to the right, and then along the middle of the dorsum of the thoracic segments, on which, however, it is very faint.

Dense tufts of setæ occupy the dorsal portion of the setigerous tori on II to VIII inclusive, and smaller tufts of very prominent setæ project from the ventral side of those of all abdominal somites. On somite I are two setigerous lines shaped like the sides of a lyre, which begin with a just perceptible curve slightly dorsad of the succeeding tuft of setæ, and diverge obliquely forward in a nearly straight line to the base of the collar, on which they extend as an inturned loop of

very minute setæ. The thoracic uncinigerous tori are strictly vertical, and ventral to the setæ, and occupy an area on each side about equal to the ventral plates. The abdominal tori are dorsal to the setæ and quite short.

On somite I the collar setæ are arranged in a double series along each line. Those of the dorsalmost series (fig. 8) are stouter, nearly straight, and are terminated by an elongated conical hood or sheath more or less inflated at the base, and usually bent or wavy in the slender distal half. They are evidently intermediate in structure between the pick-shaped uncini and limbate setæ. Those of the ventralmost series (fig. 7) are more slender, sharply curved at the end, and provided on the convex side with a short but broad obliquely striated wing. The remaining thoracic somites contain curved limbate setæ in the dorsal part of the fascicles and paddle-shaped spatulate setæ ventrally. The former (fig. 9) present no noteworthy features. The latter are arranged in close double file, those of the cephalic file (fig. 10) being stouter with very broad, truncate, usually more or less asymmetrical blades; those of caudal (fig. 11) row have nearly circular blades, which usually bear a smooth-edged mucronate tip as long as or slightly longer than the blade. In the abdominal fascicles are 2 or 3 slender, nearly or quite wingless capillary setæ, and a small number of paddle-shaped setæ (fig. 12), with small ovoid blades and a prominent, stout, fringed terminal process 2 or 3 times as long.

There are about 60 of each kind of uncini in the thoracic rows beginning with II. The avicular form (fig. 42) has the base straight, much prolonged posteriorly, and with a small rounded breast. From the base the short, somewhat tapering neck inclines forward at an angle of about 120°. There is no enlarged head, but the vertex is high, prominent and narrow, with the rather short, straight conical beak bent down at a sharp angle. The crest is scarcely differentiated, the front of the vertex being only faintly striated and not at all subdivided. Pick-shaped uncini (fig. 13) are well differentiated and regularly paired with the larger ones. They have straight, column-like stems, and hollow sheath-like heads (sometimes slightly inflated), running into slender, tapering processes nearly at right angles to the stem. The abdominal uncini are fewer, smaller, and have longer necks than the thoracic avicular uncini, but are otherwise quite similar.

The tube is slightly sinuous, nearly round in section and about 2.3 mm. in diameter. It has a peculiar tough horny texture, is thin-walled and deep brown or almost black.

From *H. phatania* (Schmarda) Marenzeller this species differs

especially in the presence of mucronate paleæ in the thoracic tori and in the greater number of setæ and paleæ in the abdominal somites, as well as in the form of the paleæ and pick-shaped uncini and the arrangement of the eyes.

Suruga Bay, 3,707, 63-75 fms., 4 specimens, with tubes.

Dasychone japonica McIntosh.

The specimens have a length of 40 mm., the branchiæ being 13. There are 8 setigerous thoracic and 76 abdominal somites and 28 to 30 branchial plumes. With the exception of occasional variations having a second small accessory tooth, the uncini are exactly as figured by McIntosh. The tentacles are lanceolate, $\frac{1}{3}$ the length of the branchiæ and thickly spotted with reddish-brown. Two specimens, one in a membranous tube to which various foreign bodies are attached, from an unknown station.

The first dorsal appendage of each branchial radiole is fully twice as long as and much thicker than any of the others, and is single, and not paired, as the others are. The collar begins dorsally as a prominent lobe, which includes the first fascicle of setæ; ventrally it is thickened and the ventral lobes overlap medially for nearly their entire width. There are no lateral incisions.

Laonome tridentata n. sp. (Pl. XII, fig. 44.)

The type and only specimen is 44 mm. long without branchiæ, which are 9 mm. in length; the thorax is 7 mm. long and 4 mm. diameter.

The detached branchiæ found in the same bottle are not known with absolute certainty to belong to this species. The basal part of each palp forms an undivided plate about twice the length of the peristomium and of a scroll-like form with a slightly spiral roll. Each bears 15 rather thick short radioles not exceeding twice the diameter of the thorax. The longest barbs or filaments at the base have a length equalling about $\frac{1}{4}$ of the body diameter, and they diminish toward the end, where the radiole terminates in a slender naked filament longer than the longest barbs. There are no eyes.

The peristomial collar is about as long as the second somite, slightly more produced on the ventral side and consequently somewhat oblique. It is deeply cleft in the middle line dorsally and slightly so ventrally, but without lateral incisions. It is thick and stiff, with the margin entire and slightly produced, but not lobed ventrally.

There are 8 setigerous thoracic and 62 abdominal somites. The body is slightly flattened, with a nearly uniform width, tapering some-

what toward the posterior end, where it terminates in a slightly oblique pygidium with a somewhat ventral anus. The peristomium and the base of the collar are dusky with numerous minute spots, which continue also on to the sides of several of the succeeding somites. No distinct ventral plates are developed, but the entire body wall appears to be somewhat glandularly thickened. Throughout the abdominal region the faecal groove is very narrow but distinct. Reaching the ventral middle line of IX it bends to the right and passes obliquely across that segment to the level of the setæ, then in the furrow VIII/IX for a short distance, and obliquely across the dorsum of VIII to its anterior border at the dorsal middle line, from which point it continues forward, becoming very deep on II and I, and finally disappears in the dorsal collar cleft.

The thoracic setigerous tubercles are quite prominent and the uncinigerous tori very long, the most anterior ones nearly meeting ventrally and the posterior not much shorter. The abdominal tori are about $\frac{1}{3}$ as long as the anterior thoracic.

The setæ occur in strong tufts, but all are broken short off at the body surface. A few fragments of the terminal parts indicate that they are short and stout, with broad blades distinctly denticulated on the margins. Both thoracic and abdominal somites bear rather large uncini, all of one kind and arranged in a single series. A torus on somite V contains 112, all of one size; on the abdominal somites they are about $\frac{2}{3}$ as large, and 41 were counted on somite XI.

They have the form (fig. 44) represented by Malmgren for the type of the genus and quite unlike that figured by Marenzeller for his *Laonome japonica*. The base is abruptly truncated posteriorly, nearly continuing the direction of the posterior line of the neck, but is produced anteriorly into a remarkably prominent breast that reaches beyond the tip of the beak. A short, thick, erect neck is surmounted by a scarcely enlarged head with a prominent, acute, slightly recurved beak nearly parallel with the opposite border of the breast, from which it is separated by a sinus much narrower than the diameter of the neck; the elevated crest is composed of 3 or rarely of 4 very distinct, acute, solid teeth of diminishing size.

Suruga Bay, 3,707, type only, without tube.

Euchone alicaudata n. sp. (Pl. XI, figs. 14-16; Pl. XII, fig. 43.)

The single example was taken from a tube and is regularly rounded and of equal diameter, with the somites very indistinctly indicated, except at the caudal end, where the body is flattened and tapers abruptly. The total length is 38 mm., the thorax 6.5 mm., and the branchia 13

mm. There are eight setigerous thoracic and twenty-five abdominal somites. The thoracic and most of the abdominal somites are obscurely equally biannulate. Ventral plates are confined to the thoracic segments and are divided into two equal parts by the transverse interannular furrows. The last eight abdominal somites are more distinctly differentiated, and decrease rapidly in diameter to the short rounded pygidium. From them the broad caudal membrane arises just ventrad of the setae, continuing anteriorly around the ventral surface nearly to the middle line, but posteriorly spreading widely as a horizontal plate with a median emargination in which the pygidium lies. The basal part of the membrane exhibits distinct metameric thickenings which disappear toward the margins.

The anus is situated slightly ventrad in a small slit, from which the very faint faecal groove passes forward between the ventral cleft of the caudal membrane to the posterior margin of somite IX, where it turns to the left, passes obliquely across the side of this somite and disappears in front of the setigerous area, but reappears in the dorsal middle line of VIII and continues to the peristomium, where it turns slightly to the left and disappears finally on the collar.

The collar is very peculiar. It is thin and rather high, its margin even all around, but, owing to the obliquity of the peristomium due to the prolongation forward of its ventral plate, the height of the collar appears to be about twice as great dorsally as ventrally. The median ventral part is injured so that the character of the ventral lobes cannot be ascertained. Laterally at the level of the sides of the ventral plates is an abrupt thinning, folded in the form of a little niche terminating at the base in a minute pit; but there is no actual incision. Dorsally a somewhat similar condition exists, each half of the collar being adherent to the median line by a very delicate membranous fold, so that no actual cleft is present. The fold of the right side overlaps the left broadly, and thus deflects the end of the faecal groove toward the latter side. No eyes nor otocysts are visible on either the peristomium or pygidium.

As indicated by the measurements the branchiae are relatively elongated, contributing about $\frac{1}{3}$ of the total length. The basal lobes are exceedingly short and are entirely concealed within the collar. There are 15 branchial radioles on each side, arranged strictly in one row and of equal length. They show no tendency to coil or twist. The radioles of each half are connected for $\frac{1}{4}$ of their length by a delicate membrane, to which they stand in the relation of the ribs to the cover of an umbrella, and which is continued as a delicate wing, especially

wide on the most dorsal and ventral member of each group, along each radiole and expands at their ends into a leaf-like appendage, through which the naked end of the radiole passes like a mid-rib, and beyond which it forms a short mucronate tip. The filaments present the usual paired arrangement and are numerous and exceedingly long, the length of the basal ones being at least $1\frac{1}{2}$ times the diameter of the thoracic segments. Besides the ordinary filaments a number of very much larger ones occur within the radioles, one apparently being attached to the base of each of several of the latter. Though none is perfect, they often equal $\frac{1}{2}$ of the length of the radioles. As they bear slight wings and have distinct cartilaginous axes, they probably represent a second set of naked radioles. The region is so brittle that a thorough study of the specimen is impossible. The tentacles are apparently short ovate-lanceolate in shape. Very small eggs completely fill the body cavity.

The setæ of the first thoracic fasciæ and the abdominal somites are apparently all slender, winged capillary, those on the latter with extremely narrow wings. On the other thoracic somites there are two forms, distinguished by the breadth of the wings and not always to be sharply separated. Those in a dorsal group (fig. 14) have slender, longitudinally striated shafts, more or less bent and drawn out to a very fine tip, the winged margin fringed, confined to one side, of varying width and reaching far out toward the end of the shaft. Those of a ventral group (fig. 15) are shorter, stouter, with short, broad, usually asymmetrical, obliquely striated double wings and an acuminate tip. The internal structure is similar to the more slender setæ.

The thoracic uncini (fig. 16), which are arranged in single rows, have long, slender, curved stems with a slight shoulder at the surface of the body and beyond it a neck; the head has a long, rather slender, slightly recurved beak and a crest from which three larger spines are separated on each side below, the rest being finely divided. The abdominal uncini (fig. 43) are truncate behind, somewhat as in *Laonome*, but with a slightly produced process; the breast is both high and prominent with a nearly square anterior margin; the sinus is very small; and the beak acute, surmounted by a crest exhibiting 6 or 7 teeth of diminishing size along the profile.

The somewhat horny, stiff tube is covered with coarse sand grains and minute bits of shell.

Sagami Bay, 3,698, 153 fms., type only.

Protula geniculata sp. nov. (Pl. XI, figs. 17, 18; Pl. XII, fig. 38.)

The two specimens upon which this species is founded were taken from the tubes, and are consequently in a rather poor state of preservation and altered in shape by the constraint. Except for the flattened and tapering caudal end the form is completely terete and the thoracic membrane is wrapped closely about the body. Following are the measurements of the type: Total length, 27 mm.; branchiæ, 5 mm.; thorax, 5.5 mm., and diameter of thorax, 1.2 mm.

Branchiæ remain in the type specimen only, and are so fragile that a complete study is impossible. Their bases are short and simple, concealed by the collar ventrally but exposed dorsally. The radioles number about 18 on each side, arise strictly in one row, although in the retracted condition some of the dorsalmost ones are turned inward and spirally twisted, so that they appear partly in a double row. Most of the radioles are rounded in section, but the dorsalmost one on each side is flattened. There is no basal web. At the base of the radioles the barbs are as long as one-half of the diameter of the thorax, but become gradually shorter toward the tip, where they leave naked a filamentous portion of the radiole about as long as the basal barbs. There is no operculum.

The strictly ventral collar is produced directly forward to a length about equal to an anterior thoracic somite; the margin is smooth and entirely without trace of any folds or incisions and with short rounded lateral lobes. The thoracic membrane is rather prominent and produced anteriorly beyond the collar, but not overlapping its lateral lobes. Dorsally the two sides overlap considerably in the middle line, and are thrown into deep oblique folds at each somite, owing to the stowing of a large surface within the small space of the tube. Posteriorly they reach beyond the last thoracic somite and join in a closely appressed ventral fold covering the first abdominal somite below.

There are seven setigerous thoracic somites and seventy abdominal somites. The bundles of thoracic seta are all at the same level and of similar size; the uncinigerous tori are short, equal and widely separated ventrally on all somites. The sides of the thoracic somites between them are transversely wrinkled. On the abdominal region the anterior tori are nearer the dorsal than the ventral side, but posteriorly they are strictly lateral. At the posterior end the body is beveled toward the dorsal side and is provided with low lateral ridges, but no distinct caudal membrane. Dorsally this flattened region bears a narrow but thick shield plate which tapers to an acute point anteriorly and is partly metameric. It occupies about 26 somites and is white and

chalky in appearance. In another specimen this plate is less attenuated anteriorly. The body throughout is much tinged with reddish-orange which was probably the natural color.

All of the thoracic setæ are of the limbate type with rather short narrowly lanceolate ends, especially slender on those of the smaller collar tuft; all are colorless, very slightly curved and of more uniform size than usual. The abdominal, except at the caudal end, bear two geniculate setæ (fig. 38) on each side. They are transparent and colorless, with broad, short, very thin and pointed blades, bent nearly at right angles to the shaft, and which appear to have the margin perfectly smooth. On the caudal somites the setæ occur in tufts of three, but occasionally two; they are long, slender, capillary, tapering and curved, but wingless at the tip.

The uncini are relatively small, very delicate, and much crowded, with about 26 distinct and some smaller obscure teeth, all strongly bent downward and overlapping. The upper part of the tooth-bearing margin with the larger teeth rises prominently above the body of the uncinus. The thoracic uncini (fig. 18) have the body quadrate with the truncate lower margin on a level with the elongated lower tooth, while the abdominal uncini (fig. 17) have nearly triangular bodies with the somewhat angulated margin not nearly reaching to the end of the long tooth. This tooth is really a projection of the body of the uncinus and itself bears a fringe of fine teeth on its basal half.

Two nearly complete tubes are present in the collection. They were evidently attached at the base only, with the greater part upright and straight or slightly sinuous, gradually increasing in diameter, perfectly terete, the walls thick, porcellaneous, with a thin, somewhat rough, chalky surface marked with distinct lines of growth, but without any ridges or other special sculpturing.

Suruga Bay, 3,707, 63-75 fms., 2 specimens.

Vermilia ctenophora n. sp. (Pl. XII, figs. 21-25.)

A complete example has a total length of 27 mm., the operculum 6.5 mm., gills 5.7 mm., and thorax 5 mm. An incomplete specimen is larger.

The branchiæ are considerably contracted and very compactly packed into the tube, without any trace of a spiral twist. The undivided base is relatively prominent, composing about $\frac{1}{3}$ of the total length of the gill. When the branchiæ are retracted the distal margin is decidedly oblique and much longer ventrally. Radioles 20 on each side, in the contracted state folded by the doubling of the base dorsad

into an inner and an outer series, the barbs of which face each other. The radioles are thick and short, with a short, thick, finger-like termination lacking barbs, and in one specimen, not enclosed in a tube, are curled inward at the ends. There are no branchial eyes. Except near the end, where they become shorter, the barbs have a length of about $\frac{2}{3}$ the diameter of the thorax and are numerous and crowded. Three or four of the dorsalmost radioles each bear at the base a larger barb, about 3 times as thick as the ordinary ones and somewhat longer. Near the median line and at a somewhat more dorsal level is the pair of tentacles of similar form but somewhat stouter. A membranous fold encircles the base of the gills within and surrounds the mouth. The last three features were clearly made out on the incomplete specimen only, not on the type.

The operculum (figs. 21, 21*a*) is dorsal and dextral. It has a slender, wrinkled, somewhat flattened stalk very slightly broader at the distal end and without wings or membranous margins. The body of the operculum is broadly egg-shaped, the basal $\frac{2}{3}$ with soft non-chitinous walls somewhat longitudinally folded, the distal $\frac{2}{3}$ a smooth, brown and firm chitinous dome with a narrow thickened double ring at the base and the surface with traces of a rough calcareous incrustation. In the type the stalk measures 4 mm. in length, .7 mm. in diameter, and the body is 2.5 mm. long and 2 mm. thick. On the larger specimen these measurements are respectively 4.5, .7, 2.5 and 2 mm.

On the type the collar and thoracic membrane are closely folded about the body from contact with the tube, but evidently fully agree with the following description, based on their expanded state in the larger cotype. The collar is produced directly forward for a distance of 1 mm. from the prostomium for the entire width of the space between the ventral margins of the setigerous tubercles. At the sides short round lobes are produced, but there are no other processes and no clefts. The thoracic membrane extends as a broad undulating fold from the first to the fifth torus inclusive, overlapping its fellow medially, the lateral margin of the collar anteriorly, and the sixth torus caudally.

The first setigerous tubercle is included in the base of the thoracic membrane; the others form, with the uncinigerous tori, freely projecting flaps which increase in size and prominence from the second caudally, the last being especially large, nearly twice its predecessor, and almost reaching the median line ventrally, while dorsally it partly covers and conceals the, in this case, detached setæ tuft. The body is slightly flattened and tapers to the caudal end, where the nearly

terminal or slightly ventral anus occupies a notch. A thickened dorsal shield plate, of a pink color and elongated elliptical form, occupies about 26 somites. There are in all 7 setigerous thoracic and about 100 abdominal somites, though the number could not be accurately determined, owing to an injury to the only complete specimen.

The thoracic setæ present the same general features as in *V. pluriannulata*, but are throughout more slender, delicate and acute, and have narrower wings; the number of nearly or quite wingless ones is also greater. Throughout the greater part of the abdominal region but two setæ (fig. 23) occur in each bundle. These are delicate, colorless and of the same type as in *V. pluriannulata*, but have narrower, less angulated and less curved blades, which in the case of one is almost perfectly straight.

The arrangement and form of the thoracic uncini (fig. 24) is also very close in the two species, the chief difference being that in this the teeth are usually 15 in number and exhibit a more exact alignment with the basal plate. Very often a minute tooth occurs on the basal plate just below the large truncate tooth, and the overlapping of the latter by the preceding tooth is often very marked. Abdominal uncini (fig. 25) differ still less, but the number of acute teeth is 11-13. The caudal setæ are all broken short off.

Only a small piece of the tube is present. It is thicker than that of *Vermilia pluriannulata*, measures 3 mm. in diameter at the mouth, which is broken, and 2.5 mm. at the opposite end. The single flange present extends only halfway around the tube on the free side, but is very prominent and flaring. The surface of the tube is marked by rough transverse lines of growth with a slightly spiral turn, and on the flange section only by 5 rough longitudinal ribs.

Suruga Bay, 3,707, 63-75 fms., 2 specimens with fragments of tubes.

Vermilia pluriannulata sp. nov. (Pl. XII, figs. 26-32, 45; Pl. XI, fig. 19.)

The single example from which this species is described measures: Total length, 19 mm.; branchiæ, 4.5 mm.; thorax, 3 mm., and diameter, 2.4 mm. The branchiæ are in bad condition, but show 19 radioles on each side, which are shorter and have relatively longer and more slender naked tips than in *V. ctenophora*.

The operculum is developed from the left dorsal branchial radiole, and the stalk and body each measure 2.5 mm. long. The former is of nearly uniform diameter, very slightly depressed and marked with numerous transverse wrinkles, as though in contraction. The body (figs. 26, 27, 28) is broadly elliptical in face views, but in profile shows a nearly parabolic ventral and a slightly convex dorsal outline. It is

divided into two nearly equal halves, the proximal of which is soft and longitudinally wrinkled, with a delicate chitinous enclosing membrane, the distal very firm and chitinous, marked by 6 very narrow dark chitinous annular thickenings which have a slightly excentric arrangement, as a result of which they are much crowded dorsally and more widely separated ventrally, leaving a nearly circular, slightly excentric, convex, pale-colored terminal disk. Probably the entire distal half, with the exception of this disk, was originally covered with a calcareous coat; rough fragments of such an incrustation remain especially on the ventral surface.

The collar is higher and its lateral lobes more prolonged than in *V. ctenophora*, but is otherwise similar. The thoracic membrane is also similar, but much higher, fully equalling the dorsal distance between the setæ tufts. As in *V. ctenophora* its base ends at the fifth seta tuft, but a free lobe projects much beyond this to the seventh.

There are 7 setigerous thoracic and about 110 abdominal somites, the posterior ones very short and much crowded. For most of its length the body is nearly terete, but at the posterior end is slightly depressed and tapering. The extreme caudal end is slightly curved ventrad, so that the anus looks downward and is somewhat covered by the posterior margin of the dorsal plate. The latter is much thickened and of an ovate form, covering about 25 somites with the broad end toward the head.

The thoracic setæ are numerous, except in the collar fascicle, and form conspicuous pale yellow tufts. Those of the first fascicle are mostly wingless or nearly so, the limbate ones being more slender and with the wings narrower than usual in succeeding tufts. On the succeeding thoracic somites the number of wingless setæ is much reduced, and most of them (figs. 29 and 30) are stouter and distinctly limbate on the convex side and, while differing considerably in length, curvature and breadth of wing, they have the wings constantly wider and more delicately striated than in *V. ctenophora*.

With the exception of those near the caudal end each abdominal fascicle bears but three colorless setæ (fig. 31) with slender stems and rather broad but exceedingly thin and delicate blades. The ends are tapering and curved, with a distinct angle at the base of the convex side, which is fringed for $\frac{2}{3}$ of its length. These setæ are always stouter, more angulated and less distinctly fringed than those of *Vermilia ctenophora*, and the 3 exhibit a closer similarity of form and size. A number (about 25) of the segments at the caudal end bear tufts of 4 or 5 long, slender, colorless capillary setæ of a quite different form (fig. 45).

They about equal or exceed the body diameter, are strongly directed ventrad, and for the greater part of their length they are gently, and near the tip more sharply, curved; and here are also flattened and provided with a delicate wing, beyond which they taper to an acute point.

The tori of somite III contain about 90 uncini and more posterior thoracic somites a much greater number. They are rather large trapezoidal plates (fig. 32), coarsely striated transversely. The pectinate margin bears 14 or occasionally 13 acute teeth, of which the 4th, 5th and 6th are the largest, the upper ones becoming shorter and the lower or cephalic ones especially more slender, the former more hooked, and the latter straighter but more imbricated and appressed, and the last 2 or 3 successively wider, flatter and more curved in the transverse plane. The last tooth is much larger, tubular and truncate, and in many cases is more or less closely embraced by the preceding one. The anterior abdominal tori bear about 20, the caudal ones as many as 50 uncini (fig. 19), which are only about $\frac{1}{2}$ as long and much more delicate than the thoracic ones which they resemble closely in form. The apical offset from the plate is more prominent, the number of teeth usually 13 or sometimes 12, and the truncate tooth is more closely embraced by the one next to it than in the thoracic uncini.

Fragments of the tube are 3.5 mm. in diameter at the mouth, 2 mm. in diameter at a distance of 30 mm. from the mouth. Externally they are marked by a series of wide flaring flanges, sometimes completely encircling the tube, sometimes coalescent with it or incomplete on one side. The surface is marked by a varying number of delicate but rough, undulating parallel longitudinal ridges about .7 mm. apart, the number being usually limited to about 6, confined to one, but not always the same, side. On the free flaring portions of the flanges these ridges become broken into flat spines, many of which are arranged transversely.

Suruga Bay, 3,713, 45 fms., type and portions of tube.

***Pomatostegus latiscapus* Marenzeller.**

Two specimens of a *Pomatostegus* agree closely with Marenzeller's description of all parts except perhaps the collar, concerning which it is simply stated that it is produced directly forward and has no lateral incisions. In the *Albatross* specimens the collar has a very irregular and ragged border, with a long median ventral process and somewhat smaller dorso-lateral processes at the level of the setæ; but no actual incisions. The setæ and operculum agree perfectly. In one specimen the operculum bears 4, in the other 7 platforms, and in the latter

is completely enveloped in a growth of sponge which forms a spherical mass fitting the lumen of the tube.

Suruga Bay, 3,707, 63-75 fms.; 3,740, 65 fms.

Pomatoceros aritubis sp. nov. (Pl. XII, figs. 33-37; Pl. XI, fig. 20.)

This species is known only from a single specimen without tube which measures 18.5 mm. in total length, of which the gills are 6 mm., the operculum nearly 7 mm., and the very short thorax, without the collar, 2.5 mm. The branchiæ have 26 radioles on each side, and each half is rolled inward in a somewhat scroll-like fashion dorsally and ventrally. The radioles are somewhat thick and are terminated by a short filament free from barbs, the basal ones of which are about $\frac{1}{3}$ the length of the radioles. A tolerably well-developed web connects the basal $\frac{2}{5}$ of the radioles.

The operculum (figs. 33, 34, 35) is developed from the dorsalmost left radiole. Its stalk is broad and flat with prominent lateral wings extending its entire length and increasing in width to the distal end, where they terminate in narrow, pointed processes embracing the sides of the opercular body. The stalk is attached excentrically to the dorsal side of the body of the operculum, which is bent strongly ventrad. The body is hemispherical with somewhat flaring margins, and bears by a short thick stalk on its distal face a membranous circular concave plate with broad, thin, flaring margins, and a low, slightly rounded central eminence. There are no spines, but two slight marks may be the scars of attachment of a pair. The free margins of the disk are chitinous, but there is but little indication of calcareous infiltration, the body of the operculum having about the consistency of a rather soft cartilage.

The collar is high and prominent, about equalling the length of the first two somites. Laterally it begins at the level of the first setæ tufts in a pair of lobes which are much overlapped by the dorsal membrane. Its margin is much folded and serrated, finely on the dorsal, coarsely on the ventral part, and in the median ventral region is produced forward as a slender lanceolate lobe, but is nowhere deeply incised. The thoracic membrane is low posteriorly, with a very delicate ventral fold, but becomes high anteriorly with the dorso-anterior angle thrown into a tuft of folds and overlapping the lateral collar lobes.

The anterior pair of thoracic setæ tufts are widely separated from the others, embedded in the thoracic membrane and project forward. Succeeding setigerous and uncinigerous tori of the thoracic region are at first placed at a high level, but sink lower and lower until on the last thoracic somite the latter are entirely on the ventral side and much

inclined forward and inward. The last two especially have their ventral ends entirely free, and those of the last meet in the middle line. The ventral plates, which are included in the area between the tori, consequently form a nearly equilateral triangle with the apex caudad. All of the abdominal somites are short and crowded, especially posteriorly, and no caudal plate or membrane is developed. The anus is terminal. No pigment remains in the specimen.

Somite I bears a compact slender tuft of pale, glistening, lanceolate, limbate setæ. They differ considerably in length, width of wing and curvature, but all have the margins very distinctly serrated. On the other thoracic somites the setæ are of the same form, but the wings are generally shorter and broader, the bundles less compact and more spreading, and more distinctly arranged in two rows, one of larger, the other of smaller setæ. Abdominal somites generally bear three delicate colorless setæ of the form shown in fig. 36. They are apparently not trumpet-shaped, but spatulate, with one angle of the flattened end prolonged obliquely into a conspicuous spine upon which the delicate teeth are continued. The stems are delicately longitudinally striated. The posterior abdominal setæ are all broken off.

The thoracic uncinigerous lines begin at the seta tufts and are rather long, that of somite II containing a few more than 200 uncini, which decrease in size toward the ventral end. Abdominal tori contain little more than $\frac{1}{4}$ as many. The uncini are delicate pectinate plates. Those of the thoracic somites (fig. 37) have quadrate plates bearing 13-15 strongly decurved, very acute teeth; the lowermost scoop-tooth is broad, opens toward the uncinial plate and projects freely beyond the lower margin of the latter. Abdominal uncini (fig. 20) are about $\frac{1}{2}$ as large and have only 11 or 12 acute teeth besides the scoop-like one, and the plate is triangular, with its lowermost angle produced into a process about $\frac{1}{2}$ as long as the lowermost tooth.

Suruga Bay, 3,713, 45 fms., type only, without tube.

The Spirorbes in the collection were submitted for study to Miss Katharine J. Bush, of the Yale University Museum, who has kindly furnished the following descriptions:

Spirorbis argutus Bush sp. nov.

Tube coiled in a low discoid sinistral form with large central cavity, spreading around the base in a thin layer, the whorls radially enlarging and ornamented by one large median keel which renders the surface on each side slightly concave, all crossed by distinct transverse lines. Smaller specimen about 1 mm. in diameter; larger, about 1.5 mm.

Branchiæ too much matted to determine their number. Operculum (fig. *a*) a thin transparent elongated membranous bulb, flat on top and protected by a thin calcareous disk slightly thickened in the center, borne on a long, very slender peduncle.



Fig. *a*. *S. argutus*, operculum mounted in glycerine.

Thorax with three fascicles of setæ and two rows of uncini on each side. All the setæ simple tapered blades (fig. *b*), so small and delicate as not to be clearly seen under a 7 objective, showing no serrations on the edge of the blade even under $\frac{1}{10}$ oil immersion. Uncini very narrow, linear, the teeth appearing as but slight roughnesses on the surface, even under the highest power. Abdominal uncini in the first series or segment not appreciably smaller than those on the thorax; setæ not found.

Two specimens on one of the red algæ with the following (*S. foraminosus*), at Station 3,730, in 34 fathoms, May 16, 1900.

***Spirorbis foraminosus* Bush sp. nov.**

Tube coiled in a similar manner to that of *S. argutus*, but in the opposite direction, and larger, with the surface ornamented with three distinct carinæ, the middle one the most prominent, the surface on each side, or the interspaces, slightly concave and punctured by minute holes or foramina, apparently caused by the erosion of the thin epidermal layer; the immature forms probably having the entire surface crossed by numerous prominent transverse lines.



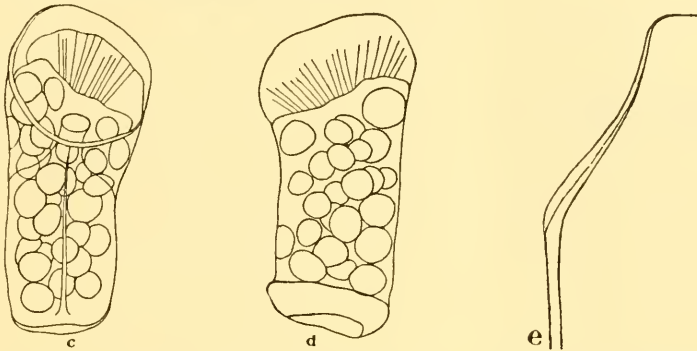
Fig. *b*. *S. argutus*, seta from 3d thoracic somite.

Branchiæ, the number of which is not determined, are long and folded about, partially covering or protecting the large operculum (figs. *c* and *d*), which is in the form of an elongated (apparently stiffened by a very thin deposit of lime) cylinder-like broodpouch filled with eggs: the end protected by a calcareous disk with flaring edge and an inner enlarged basal portion, showing the length of the ventral area attached posteriorly to the secondary calcareous disk on the end of the operculum proper, which is formed of many longitudinal muscles spreading

from a short peduncle, which is apparently differentiated from the longitudinal ventral muscular layer of the body-wall and separated from the branchial lobes.

Thoracic setæ simple tapered blades with but little color in three fascicles on each side with two series of uncini. Those on the collar (fig. *e*) somewhat broader and less regularly tapered than the others; no odd ones found in the second or third bundles. Uncini distinctly yellow or delicate horn-color with numerous fine teeth, clearly seen under a 7 objective, those on the abdomen much shorter and associated with a single similarly colored seta.

Two specimens on one of the red algæ with *S. argutus*, at Station 3,730, in 34 fathoms, May 16, 1900.



Figs. *c* and *d*. *S. foraminosus*, front and rear views of operculum, filled with eggs.

Fig. *e*. *S. foraminosus*, seta from collar fascicle.

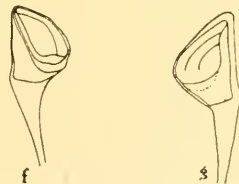
***Spirorbis bellulus* Bush sp. nov.**

Tube small, regularly coiled, dextral, with small central cavity, the rounded whorls ornamented with three, sometimes four, unequal, rounded threads, the one on the summit being more prominent than the others.

Specimens from 1 to 1.5 mm. in diameter.

Branchiæ peculiarly developed, probably abnormal, broad, thin, flattened, with few pinnæ. Operculum (figs. *f* and *g*) on a very long peduncle, with somewhat squarish calcareous plate with deep erect thickened rim.

Setæ (fig. *h*) long and slender simple blades, similar in all the fascicles which are three on each side of the thorax with two series of uncini, those on the collar showing a few comparatively



Figs. *f* and *g*. *S. bellulus*, operculum, front and rear views.

coarse serrations on edge, seen under a 7 objective. Uncini very narrow, the teeth too fine to determine. Abdominal setæ and uncini not seen.



Fig. h. *S. bellulus*, seta from collar fascicle.

Steamer *Albatross*, May 8, 1900, at Station 3,707, off the coast of Japan, in 63-75 fathoms. Five specimens on fragments of mollusks and pebbles.

***Spirorbis dorsatus* Bush sp. nov.**

Tube small, regularly coiled, dextral, differing from the preceding (*S. bellulus*) in having but one very prominent keel on the middle of the whorls, rendering the tube three-sided. A small nematode worm and sand filled the tube, but no animal was found.

Three specimens were found with the preceding, at Station 3,707, in 63-75 fathoms.

As no animals were found, it is impossible to determine whether or not these tubes may not be the young of *S. foraminosus*.

EXPLANATION OF PLATES XI AND XII.

PLATE XI, Fig. 1.—*Sabella japonica*. Slender lanceolate seta from ventral part of the fascicle of V, $\times 480$.

Fig. 2.—*Sabella japonica*. Small uncinus from the dorsal part of the torus of V, $\times 480$.

Figs. 3-6.—*Potamilla acuminata*.

Fig. 3.—Slender seta from dorsal part of VI, $\times 335$.

Fig. 4.—Face view of a slender seta from XI, $\times 335$.

Fig. 5.—Two views of a spatulate and mucronate seta from ventral part of VI, $\times 335$.

Fig. 6.—A pick-shaped uncinus from VI, showing a slender tip of about the average length, $\times 600$.

Figs. 7-13.—*Hypsicomus lyra*.

Fig. 7.—Limbate seta from the ventral series of the collar fascicle, $\times 480$.

Fig. 8.—Hooded seta from the dorsal series of the same, $\times 480$.

Fig. 9.—Limbate seta from the dorsal part of V, $\times 335$.

Fig. 10.—Plain paddle-shaped seta from the ventral part of V, $\times 335$.

Fig. 11.—Mucronate paddle-shaped seta from the same, $\times 335$.

Fig. 12.—Bilimbate pointed seta from a posterior abdominal somite, $\times 335$.

Fig. 13.—Pick-shaped uncinus from VI, $\times 480$.

Figs. 14, 15, 16.—*Euchone alicaudata*.

Fig. 14.—Outline of slender seta from the dorsal part of V, $\times 480$.

Fig. 15.—One of the more symmetrical broadly bilimbate setæ from the ventral part of V, $\times 480$.

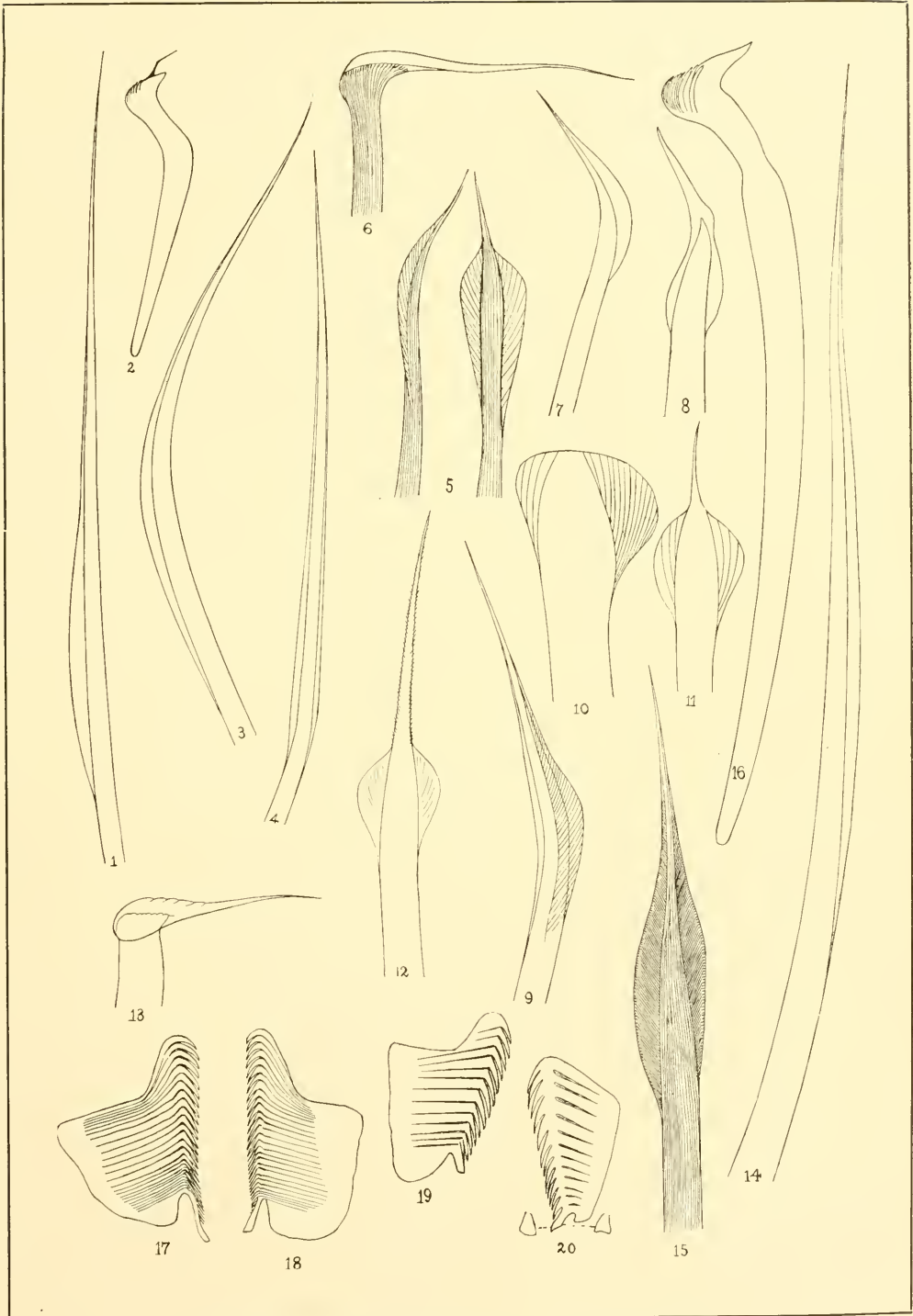
Fig. 16.—A crochet from VI, $\times 480$.

Fig. 17-18.—*Protula geniculata*. Abdominal and thoracic uncini respectively, $\times 800$.

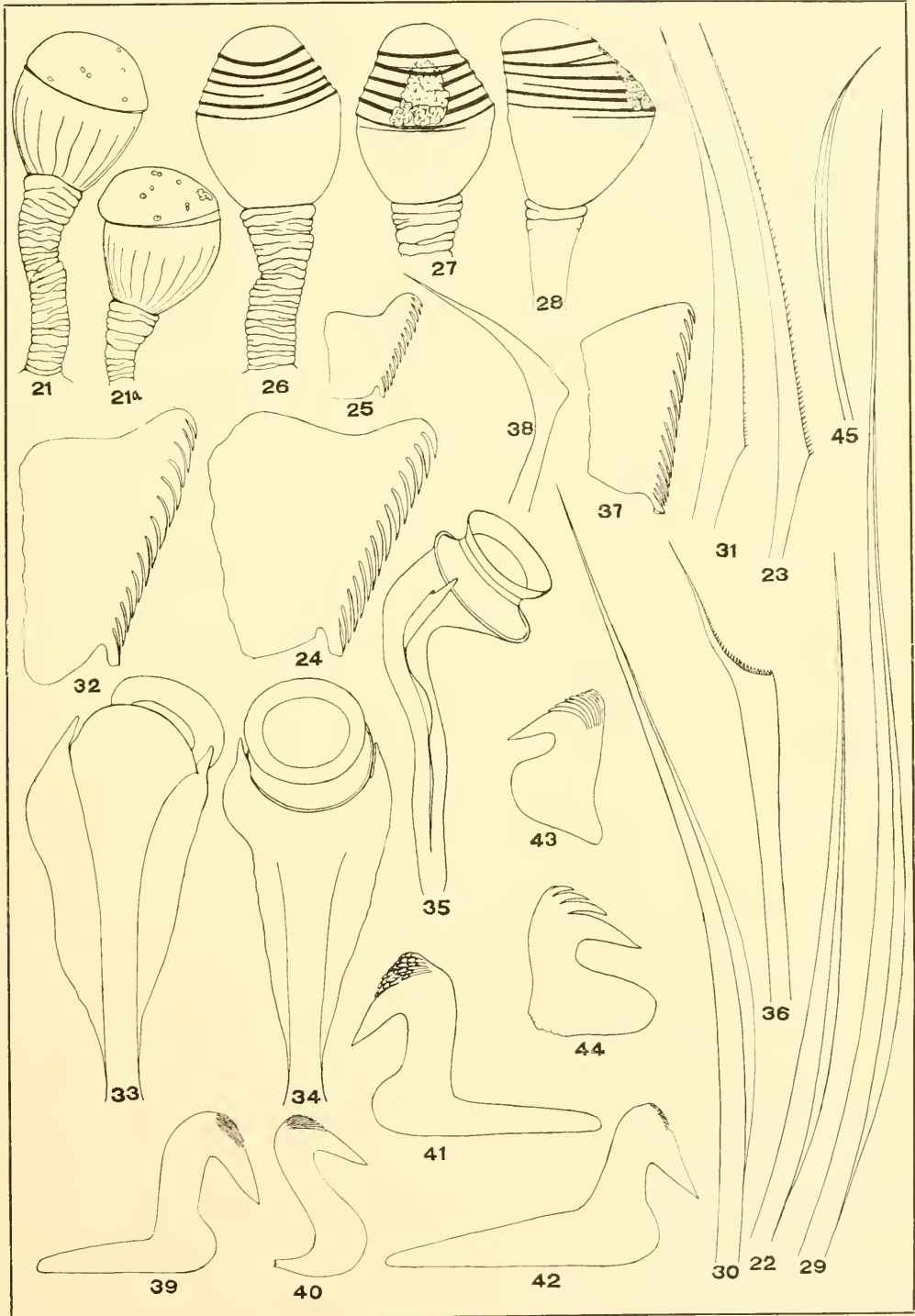
- Fig. 19.—*Vermilia pluriannulata*. An abdominal uncinus, $\times 600$.
 Fig. 20.—*Pomatoceros auritubis*. An uncinus from the middle abdominal region, showing also the outlines of the front and back faces of the large gouge-shaped tooth, $\times 600$.

PLATE XII, Figs. 21 to 25.—*Vermilia ctenophora*.

- Figs. 21, 21a.—Dorsal and lateral views respectively of operculum, $\times 8$.
 Fig. 22.—An average limbate seta from VI, $\times 250$.
 Fig. 23.—The smallest and most curved seta from an abdominal pair, $\times 440$.
 Fig. 24.—Uncinus from V, $\times 440$.
 Fig. 25.—An uncinus from the middle abdominal region, $\times 440$.
 Figs. 26 to 32.—*Vermilia pluriannulata*.
 Figs. 26, 27, and 28.—Dorsal, ventral and lateral views respectively of the operculum, $\times 13$.
 Figs. 29 and 30.—Long and short slender limbate setæ from VI, $\times 250$.
 Fig. 31.—The middle seta of the three on somite XXX, $\times 440$.
 Fig. 32.—An uncinus from V, $\times 440$.
 Figs. 33 to 37.—*Pomatoceros auritubis*.
 Figs. 33, 34, 35.—Dorsal, ventral and lateral views respectively of the operculum, $\times 8$.
 Fig. 36.—Middle abdominal seta, $\times 440$.
 Fig. 37.—Uncinus from IV, $\times 440$.
 Fig. 38.—*Protula geniculata*. Seta from middle abdominal region, $\times 250$.
 Fig. 39.—*Sabella japonica*. Uncinus from dorsal part of VI, $\times 360$.
 Fig. 40.—*Sabella japonica*. Uncinus from ventral portion of a middle abdominal uncinus, $\times 250$.
 Fig. 41.—*Potamella acuminata*. Uncinus from VI, $\times 360$.
 Fig. 42.—*Hypsicomus lyra*. Uncinus from VI, $\times 360$.
 Fig. 43.—*Euchone alicaudata*. Uncinus from XXI, $\times 360$.
 Fig. 44.—*Laonome tridentata*. Uncinus from XVI, $\times 360$.
 Fig. 45.—*Vermilia pluriannulata*. End of a capillary caudal seta representing about $\frac{1}{4}$ of the exposed part, $\times 250$.



MOORE. SABELLIDÆ AND SERPULIDÆ.



MOORE. SABELLIDÆ AND SERPULIDÆ.