59.7(82.9)

Article IV.— NOTES ON A SMALL COLLECTION OF FISHES FROM PATAGONIA AND TIERRA DEL FUEGO.

By L. Hussakof.

The fishes of the extreme southern part of South America are already well known in outline, thanks to the many antarctic and other expeditions to that region; but much still remains to be learned regarding the distribution, variation and ecology of most of the forms, some of which are represented by only a few specimens scattered in different museums. For this reason any data bearing on this fauna are valuable, and should be put on record. It was with this idea in mind that the following notes were brought together. They are based on a series of 74 specimens, representing 14 species, collected by Mr. Barnum Brown of the American Museum of Natural History, in Patagonia and Tierra del Fuego, in 1899–1900. As Mr. Brown's special mission was to collect fossil mammals, fishes and other natural history specimens were gathered only incidentally, as opportunity offered, so that the collection is necessarily small; still it contains a number of features of considerable interest.

The specimens are all either from the Atlantic side of Patagonia, south of the Santa Cruz River (Latitude 50° S.), or from Tierra del Fuego. With the exception of the genus *Galaxias*, all are marine.

1. **Myxine australis** *Jenyns.*

Two specimens, 230 and 298 mm. respectively; north of the mouth of the Rio Coyle, Patagonia.

In the larger specimen the distance to the gill opening is contained 3.38 times in the length; in the smaller, 3.48 times. The number of pores in the larger specimen is, 33+54+8–10 (8 on the left side, 10 on the right).

It may here be mentioned, since the fact is sometimes overlooked by authors, that a second species of *Myxine* is known from this region — *M. tridentiger* Garman,[1] recorded from the extreme southern part of South America.

2. **Squalus fernandinus** *Molina.*

A single specimen, 225 mm. in length; 25 miles south of the mouth of the Rio Coyle, Patagonia.

[1] Mem. Mus. Compar. Zool. Harvard College, XXIV, 1899, p. 345.

3. **Egg-case of an Elasmobranch** (Fig. 1).

A remarkable shark egg-case is represented in the collection (No. 5000, Am. Mus.), which I am unable definitely to identify. A similar specimen, from the same locality, was figured by Vaillant in 1891 (Mission Sci. du Cap Horn, t. VI, Poissons, pl. i, fig. 1 F.), who considered it to belong to *Scyllium*. But it is obvious, on comparison with a *Scyllium* egg capsule, that it is not of that genus. In the *Scyllium* capsule the upper margin is truncated and filaments emanate from the angles, whereas in the present specimen the upper margin is rounded and without filaments. There are preserved the remains of the delicate fibrous tissue by which the capsule was attached to the ovarian tube of the shark; this tissue is rolled together into a band on each side and the two bands are intertwined. (Fig. 1). Only four sharks have been recorded from this region — two species of *Acanthias*, a *Centroscyllium*, and a *Scyllium;* and the present capsule does not seem to belong to any of these. It is not *Scyllium*, for the reasons given above; it cannot be *Acanthias*, since this genus is viviparous; and it is in all probability not *Centroscyllium*, since this shark belongs in the same family with *Acanthias* and is very probably also viviparous. It would thus seem that the present egg-case represents a shark not yet recorded from this locality.

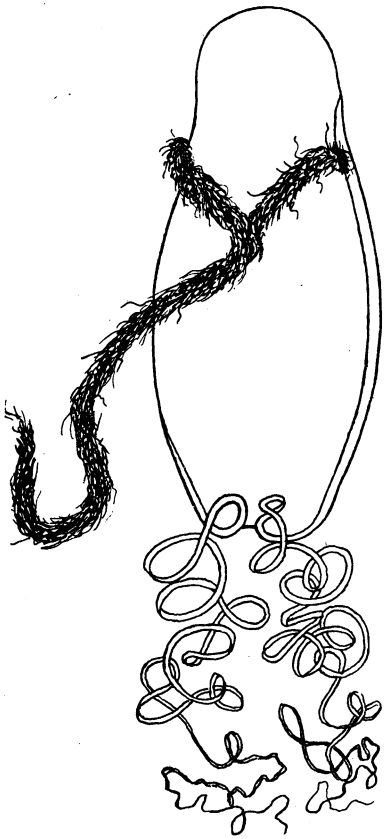

Fig. 1. Egg-case of a shark of unknown species; natural size. Southern Patagonia.

It may be mentioned, in passing, that the egg-case from the Straits of Magellan, figured by Günther in his 'Introduction to the Study of Fishes' (p. 167), and considered by him as probably belonging to *Scyllium chilense*, is correctly referred to that genus, and is quite distinct from the present specimen.

4. **Egg-case of Raja** sp. (Fig. 2).

Four egg-cases; 30 miles south of the Santa Cruz River, Patagonia. No. 5001, Am. Mus.

These egg-cases are remarkable for their extraordinarily long filaments, which are many times longer than in any *Raja* egg-case yet known. In

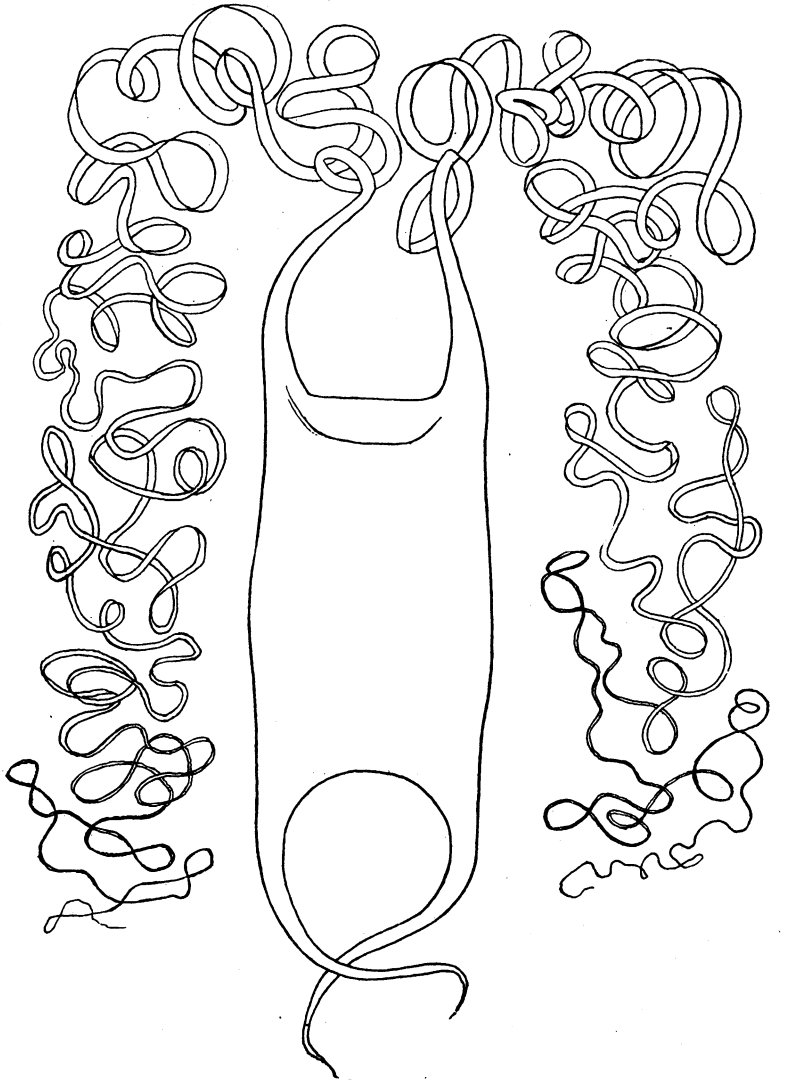

Fig. 2. Egg-case of *Raja* sp., × $\frac{5}{6}$. Southern Patagonia.

Raja circularis, hitherto regarded as the extreme in respect to the length of the upper filaments, these are only 2.5 times as long as the body of the egg-case; but in the present species they are as much as 15 times the length of the body of the case. The filaments are, of course, knotted into a dense mass, so that it is almost impossible to unravel one completely and measure it. One was carefully traced for a length of 809 mm., and this was still considerably short of the entire filament. Since the body of the capsule is 54–60 mm. in length, the filaments are thus 14 or 15 times as long. The lower filaments are about as in other species of *Raja.*

5. **Clupea fuegensis** *Jenyns.*

Four specimens, 124 to 167 mm. in total length; Ushuaia, Tierra del Fuego.

According to a note by Mr. Brown, the Indians go out in boats to the kelp and catch these little fishes in their hands, while they are feeding.

The four specimens agree with *Clupea fuegensis* as far as the meager description by Jenyns (Zool. of the 'Beagle,' vol. III, Fishes, p. 133), who had only a single specimen, allows of comparison. The number of rays in the dorsal and anal agrees with his description, and the origin of the ventrals is underneath the origin of the dorsal. *Clupea arcuata* Jenyns, seems to be merely a synonym of *C. fuegensis,* the only difference between the two pointed out by Jenyns, being the somewhat larger anal in the former, with 23 instead of 19 rays. Vaillant has given an excellent figure (Mission Sci. du Cap Horn, t. VI, Poissons, p. C. 16, pl. ii. fig. 2) of this species, under the name of *C. arcuata,* with which the American Museum specimens agree.

The following diagnosis may be found useful:

Head slightly over 4 in length to base of caudal; depth somewhat less than head, and $4\frac{2}{5}$ in length. Eye, equal to snout, and $3\frac{1}{2}$ in head. Dorsal 18; anal 19 or 20. Origin of ventrals under, or slightly in advance of, origin of dorsal, and equidistant from tip of pectoral and origin of anal. Ventrals extending two-fifths the distance from their origin to the beginning of anal. Origin of anal a short distance behind tip of dorsal when laid back. Depth of peduncle, a little less than 3 in depth of fish. Scales, about 50 in longitudinal series; 13 in transverse.

6. **Notothenia coriiceps** *Richardson.*

Seventeen specimens, 50 to 130 mm. in total length; 12 from 25 miles south of the Rio Coyle, Patagonia; 5 from Ushuaia, Tierra del Fuego.

This is the most widely distributed species of the Nototheniidæ, being

circumpolar in distribution. It has been recorded from both coasts of southern Patagonia, from the Strait of Magellan, South Georgia Island, Kerguelen, Chatham Island, New Zealand, Auckland Island, Victoria Land, and the antarctic seas generally. As one would expect with so widely ranging a form, the species is highly variable, and shows a number of local phases some of which have received distinct names.[1]

The largest specimen (130 mm.) in the series is of special interest, since it throws light on the breeding season of the species. It was collected May 25, 1899, and is greatly distended with eggs. These are over .5 mm. in diameter, but from their long immersion in formalin and alcohol, cannot be studied in detail. No. 5003, Amer. Mus.

Color.— The young (in alcohol) are light brown above, traversed by six more or less regular, dark brown bands, the first on the nape, the last at the base of the caudal; under side pale. The hinder portion of the spinous dorsal is blackish; the soft dorsal grayish, with narrow darkish bands running obliquely upward and backward. The caudal has four or five darkish bands similar to those on the soft dorsal, and the anal a few dark spots. In the adult, the head and back are darker than in the young, and the bands are more or less obsolete; the fins, however, retain a good deal of their darkish mottling.

The variation in the number of fin rays, and in one or two other details, was found to be as follows:

Dorsal V–VI, 29–34; anal 27–33, 28 or 29 predominating. Interorbital width $4\frac{1}{2}$ to 6 in length of head, $5\frac{1}{2}$ to $5\frac{4}{5}$ predominating. Head $3\frac{1}{2}$ in length to base of caudal. Width of head $1\frac{1}{2}$ in its length.

7. **Notothenia macrocephala** *Günther.*

Two specimens, 128 and 152 mm. to base of caudal; one from Ushuaia, Tierra del Fuego, the other without record, but probably from the same locality.

Dorsal IV–V, 30–31; anal 24–25. Interorbital width about $2\frac{1}{2}$ in length of head; scales in lateral line, about 62.

8. **Notothenia tessellata** *Richardson.*

A single specimen, 140 mm. in total length; Ushuaia, Tierra del Fuego.

This specimen agrees in general appearance with those of *N. canina* mentioned below, except that the teeth are not so large and there are more

[1] See synonymy by Boulenger in, "Report on the collections of natural history made in the antarctic regions during the voyage of the 'Southern Cross.'" London, 1902. 8°. p. 183.

scales in the longitudinal series — about 85 as against 71–79. Head $3\frac{1}{2}$ in length to base of caudal. Interorbital width 5 in head. Dorsal VI, 34; anal 32.

9. **Notothenia canina** *Smitt.*

Two specimens, 71 and 171 mm. in total length; 25 miles south of the Rio Coyle, Patagonia, and Ushuaia, Tierra del Fuego.

The larger specimen has very conspicuous canine teeth; the principal character, as pointed out by Boulenger [1] distinguishing this species from *N. tessellata.* In this specimen the head is contained $3\frac{1}{2}$ times in the length to base of caudal, and the depth a little over 5. Interorbital width 5 in length of head. Lower jaw projecting considerably beyond the upper. Dorsal VI, 34; anal 31. Ventrals three-fifths length of head, and five-sixths length of pectoral. Scales in longitudinal series, 79 in the larger specimen, 71 in the smaller.

Both specimens are much faded in color (in alcohol), but the fish apparently had dark bands on the body. The hinder half of the spinous dorsal is blackish, and the end of the caudal was apparently also this color.

10. **Harpagifer bispinus** (*Forster*).

Twenty specimens, 47 to 74 mm. in total length; 17 from Ushuaia, Tierra del Fuego, 3 from north of the Rio Coyle, Patagonia. The latter were collected under rocks at low tide and are of a much paler color, although with the same bands and mottlings on the body and fins as the others. They also have one ray more in the spinous dorsal — that is, 4 instead of the usual 3 — but otherwise are quite similar to those from Ushuaia.

This interesting little fish is common throughout this region. It is a shore-fish, occurring in tide pools, under rocks and in the kelp in shallow water. It was once taken at a depth of 50 to 75 fathoms — by the 'Challenger' — but it had probably been carried out with kelp, and does not ordinarily live at such a depth.

One of the largest specimens (61 mm. to base of caudal) is greatly distended with eggs (collected March 30, 1900, Tierra del Fuego). These are remarkably large for a species of such small size, measuring about 1.5 mm. in diameter. No. 5011, Am. Mus.

The fin formula of the species is somewhat variable: dorsal III–IV, 22–25; anal 17–20. Head contained $2\frac{3}{4}$ to 3 times in length to base of caudal.

[1] *Loc. cit.*, p. 183.

11. **Lycodes latitans** (*Jenyns*).

Five specimens, 115 to 283 mm. in length; near mouth of the Rio Coyle, Patagonia. Collected from under rocks at low tide. One of the smaller specimens had its mouth filled with fragments of kelp on which it had been feeding.

As has been pointed out by previous writers,[1] there is great variation in the Lycodidæ, which makes the separation of species difficult. In the present species variation is shown among the specimens in hand, as well as on comparison of these with the descriptions given by authors. For instance, the largest specimen (283 mm.) has a smaller eye and a somewhat longer head than the specimen described by Günther in his catalogue of the fishes in the British Museum (Vol. IV, p. 321). The species reaches a length of at least 360 mm., as shown by a specimen of this size recorded by Vaillant (Mission Sci. du Cap Horn, t. VI, p. C. 21).

Color.— The young of this species are more or less barred with whitish (in alcohol); the smallest specimen in hand has a pale band on the occiput, and another on the back and the dorsal fin at a point opposite the end of the pectoral; also obscure indications of one or two other bands on the hinder half of the fish. The white horizontal bar under the eye, and the pale spot on the lower half of the opercle, are also rather more distinct than in the adult. In the next larger specimen, 126 mm., the bar under the eye is reduced to a small spot, and all the bands have disappeared, so that the fish has the uniform coloration of the adult: dark brown above, paling slightly downward on the sides, and the lower jaw, lower half of the operculum and the gular region whitish.

In the 283 mm. specimen the head is contained 5 times and the depth $9\frac{2}{3}$, in the total length. Pectoral $1\frac{2}{3}$ in distance from its tip to origin of the anal fin. Distance from tip of snout to origin of anal somewhat less than one-half the entire length of the fish.

12. **Platea insignis** *Steindachner.*

Zool. Jahrb. Suppl.-Bd. IV, 1898, p. 323, pl. xx, figs. 12–12b.

A single specimen, 358 mm. in length; taken near a wreck, Policarpo Bay, Tierra del Fuego. No. 5015, Am. Mus.

This is the second specimen of this genus to be put on record. It differs from Steindachner's specimen (according to his description), in being some-

[1] For instance, F. A. Smitt "On the genus *Lycodes*." Ann. Mag. Nat. Hist., 7 ser., V, 1900, pp. 56–58.

what deeper (depth about $11\frac{1}{2}$ instead of $14\frac{1}{2}$ in the length); in having a smaller eye, the interorbital space being a little wider than in his specimen, and in one or two other details. But the general correspondence, including that of the details of color, is extremely close. There is only a little more mottling on the front part of the anal fin in this specimen than in the type.

Measurements of a Specimen of Platea insignis.

	mm.	Remarks
Total length	358	
Tip of snout to origin of anal	114	.32 of the length
Origin of anal to posterior extremity of fish	244	.68 " " "
Head	52	Contained 6.9 in the length
Depth	31	" 11.6 " " "
Eye	6	" 8.66 " " head
Interorbital space	12	" 4.33 " " "
Snout	17	" 3. " " "
Greatest breadth of head	41	
Pectoral (measured from its lower attachment	37	" 1.4 " " "
Ventral	10	" 5.2 " " "

13. **Maynea patagonica** *Cunningham.*

A single specimen, 142 mm. in length. South of Latitude 50° S; exact locality not recorded.

This is a rare species, only seven or eight specimens having been previously recorded. As pointed out by Günther (Proc. Zool. Soc. London, 1881, p. 20), *Maynea* resembles *Gymnelis* in the young being banded whilst the adults are of a dull, uniform color. Our specimen agrees in coloration with the one figured by Günther, which it exceeds by about 2 inches. It has a brown ground color (in alcohol), somewhat darker on top of the head, and is traversed by 13 pale bands which cross the body and the dorsal and anal fins; first band on occiput, second crossing dorsal fin; the fifth crossing both the dorsal and anal. The pale areas are less than half the width of the intervening colored bands. The jaws and the region underneath the eye, to within a short distance of the gill opening, pale with slight mottling; gular region and ventral side of the body, to within a short distance back of the pectorals, also pale; pectoral fins darkish except along the margins, which are pale; tip of tail whitish.[1]

[1] The specimen is covered with an opaque precipitate of slime, but none the less the coloration can be clearly made out.

It may be mentioned that in lacking ventral fins, *Maynea* is more closely allied to *Gymnelis* than to *Lycodes*.

Head $7\frac{1}{3}$ in total length; depth $12\frac{1}{2}$. Eye equal to interorbital width and about $1\frac{2}{3}$ times in snout. Upper jaw slightly projecting beyond lower. Origin of dorsal above posterior extremity of opercular membrane; origin of anal under beginning of second fourth of the dorsal.

14. **Galaxias maculatus** (*Jenyns*).

Thirteen specimens, 45 to 81 mm. in total length. From fresh water, Thetis Bay, Tierra del Fuego, March 6–7, 1900.

A careful study of these 13 fishes raises the question whether *G. maculatus* and *G. attenuatus* are really distinct species. According to Regan's revision of the Galaxiidæ (Proc. Zool. Soc. London, 1905, pp. 363–384, pls. x–xiii), a trenchant difference between these two species consists in the position of the ventral fins: in *maculatus* their origin is nearer the base of the caudal than the tip of the snout; in *attenuatus* it is either nearer the tip of the snout than the base of the caudal, or else equidistant from these two points. Now in the present lot of 13 specimens, which seem by coloration and general proportions undoubtedly of one species, one finds all three positions of the ventral fins, and among those which have the *maculatus* fin position clearest expressed, one finds a strong agreement in other characters with *G. attenuatus*, and *vice versa;* so that one is uncertain, in the case of several of the specimens, whether to refer them to the one or the other species. For instance, the largest specimen in the lot, 81 mm. in total length, agrees closely with the diagnosis of *G. maculatus;* and yet the snout — to mention only one character of several that might be given — is not less than the eye, as it should be in this species, but $1\frac{1}{3}$ times the eye, as in *G. attenuatus*. The conclusion from a series of such comparisons, involving various characters, is, that the forms distinguished as *G. maculatus* and *G. attenuatus* are really varieties of one species.

It may be urged that this view is based on specimens that are immature, the largest being only 81 mm. in total length, which is considerably less than the adult of this species; that while the young of *G. maculatus* and *G. attenuatus* may overlap in certain characters, the adults are really distinct and constitute two good species. This is of course an important objection, and must be given full weight in a re-study of the two forms. But unless it can be shown that full-grown specimens of *G. maculatus* and *G. attenuatus* are more definitely separated from each other than the younger specimens in hand are, the two forms will have to be merged under one name, *Galaxias maculatus*.

Color (in alcohol).— Head and median line of back darkish; sides with a pale orange ground color over which are diffused innumerable purplish dots arranged in patterns, making the fish appear at a little distance as if purplish, with pale marbling. In the younger specimen (60 mm. in total length) the back is not quite so dark, and the dots on the sides are distributed evenly, so that the specimen appears at a little distance of a uniform purplish color, which gradually pales downward.

Bibliographical Note.

A detailed analytical bibliography of the fishes known from the Strait of Magellan and neighboring waters was given by Louis Dollo on pages 67–78 of the "Résultats du voyage du S. Y. 'Belgica.'" Expedition antarctic Belge. Anvers, 1904. Poissons. 1–239 p., i–xii pls. 4°.

To this need only be added the following important references:

Boulenger, G. A.

1902. Report on the collections of natural history made in the antarctic regions during the voyage of the 'Southern Cross.' London. Pisces. Pp. 174–189, pls. xi–xviii. 8°. [Contains a synopsis of the family Nototheniidæ.]

1907. National antarctic expedition 1901–1904. Natural History. Vol. II. Zoology. Chap. iv. Fishes. 5 pp., 2 pls.

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1905. The fishes of the Swedish south polar expedition. Wissens. Ergeb. d. Schwedischen Südpolar-expedition 1901–1903, V, Lieferung 6, pp. 1–69, pls. i–v.