

A CATALOGUE OF THE FISHES OF GREECE. WITH NOTES ON THE
NAMES NOW IN USE AND THOSE EMPLOYED BY
CLASSICAL AUTHORS.

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The first-named author of the present paper spent a large part of the spring and summer of 1890 in Greece. Part of this time was devoted to making collections of the fishes found in the markets of Athens and to the study of the vernacular names now applied by the Greek fishermen to these fishes. Each fish as obtained was preserved in alcohol, a number attached to it, and a record kept of the vernacular name attached to this number.

The persistence of vernacular names of fishes and other animals is known to be very great, and it may be safely assumed that the most of these names now heard in Athens are derived from those applied to the same species in the time of Aristotle. It has been thought that a study of these names would tend to throw light on those applied to fishes by classical authors. The fact that no such collection or comparison of names of fishes has yet been made is the justification of this paper.

A single catalogue of the fishes of Greece is known to me, that published by my friend, Professor Apostolides in 1883 (*La Pêche en Grèce: par Nicolas Chr. Apostolidès*). This work contains numerous vernacular names and it has been largely drawn upon in the present paper.

In this paper is printed a systematic list of the fishes known from Greece, either on the authority of Apostolides or from my own collection, with the vernacular names and such notes on them as I am able to offer.

No one can be more fully aware than I am, of the unsatisfactory character of many things in this paper. It was often difficult or impossible to make out with certainty just what Aristotle meant. Some terms occurring over and over and evidently having a very definite meaning to him are obscure to us, and the meanings given in the dictionaries are only guesses. A good illustration of this is the word *ὑπόζωμα*, usually translated diaphragm. We have no right to assume that Aristotle always, or ever, meant by this term the diaphragm, especially in those instances where it makes him entirely wrong in regard to the anatomical facts. In those matters

which could be seen by dissection I feel convinced that Aristotle made the dissections for himself and reported what he saw. He may not always have seen aright in nice points, and he certainly did not understand what he saw as it is understood in the light of modern science; but there is no ground for assuming that he did not see what would be apparent to any one who took the least pains to look, even if with unpractised eye. A striking confirmation of the correctness of his observation in matters of anatomy was afforded by the repeated statement that the *βάρραχος* (*Lophius piscatorius*) has its gall bladder upon the intestine, not upon the liver. A dissection of this fish by Dr. Charles H. Gilbert proved the statement of Aristotle to be correct. I believe that a reading of Aristotle in the original accompanied by dissections of the animals in question would bring one to a much better understanding of his anatomical terms, which are much in need of some such elucidation.

It is quite otherwise when he comes to the habits of the fishes and other matters than anatomical knowledge. Here he has to depend upon the observations of the fishermen and others, and what he has to say simply records the prevalent beliefs. Of course much of this fisherman's lore is real knowledge gained from observation, but it has also a considerable share of myth.

Another great source of difficulty is corruption of the text. Considering all the time and the vicissitudes that the Mss. of Aristotle have passed through it is always more or less problematical as to whether in any given passage we have just what Aristotle said.

For the nomenclature and systematic arrangement of the species, the identification of my specimens, and for all matters purely zoological in character I am indebted to Dr. David S. Jordan, at whose suggestion the work was undertaken. The specimens obtained are in the museum of the University of Indiana.

EXPLANATORY NOTES.

1. The following order of statement has been adopted: (1) Scientific name by Dr. Jordan. (2) M. G. (Modern Greek) name or names heard by me in Greece, if any; each name followed immediately by a small figure in parenthesis indicating the number of specimens secured under that name. (3) A reference to the page of Apostolides' book (*La Pêche en Grèce par Nicolas Chr. Apostolidès, Athènes, 1883*), where the species is given, followed by the scientific

name used by him, and the vernacular name or names given by him. (4) The similar name or names from A. G. (Ancient Greek) authors, chiefly Aristotle, references to the places in their works where these names are found, and a gathering up of the chief things said about the fish in question, especially anything which might in any way help to fix the identity of the species.

Explanatory remarks and comments are thrown in wherever in each case it seems most suitable.

2. Modern Greek names marked with an asterisk (*) were heard by me in the market at Athens, sometimes elsewhere in Greece, but do not occur in Apostolides' list.

3. Names marked with a dagger (†) occur in Apostolides, but were not heard by me in Greece.

4. Names not marked by any sign were both heard by me and found in Apostolides. They are not marked if the variations in form are slight and insignificant, even if the forms are not identical.

5. When the names are derived from other sources the source is given in connection with the name.

6. The references to Aristotle are taken from the Index Aristotelicus of Hermann Bonitz, and, as there, refer to the page, column and line of the quarto edition of Aristotle's works issued by the Royal Academy of Prussia through Georg Reimer, Berlin.

The references to Athenaeus, mostly from the VIIth book, are given by book and section, Editio C. Tauchnitii, Otto Holtze, Leipzig, 1887.

7. Species obtained by me in Greece are marked H. The list which follows is that of Apostolides, the species arranged in accordance with the views of American authors and the accepted rules of nomenclature applied to their names.

Family BRANCHIOSTOMATIDÆ.

1. *Branchiostoma lanceolatum* (Pallas).

Apost. 35 (*Branchiostoma lanceola* or *Amphioxus lanceolatus*)

Family PETROMYZONTIDÆ.

2. *Petromyzon marinus* (L).

Apost. 34 (*Petromyzon marinus*), † λάμπρυνα, Lat. *lampetra*, rock-sucker, Eng. lamprey; λάμπρυνα is evidently of Latin and Italian origin.

Family **SCYLLIORHINIDÆ.**3. *Scylliorhinus canicula* (L).

Apost. 5 (*Scyllium canicula*), † *σκυλί*, † *σκυλόψαρο*, dog, dog-fish. A. G. *σκόλαξ*, whelp, pup, dog. M. G. *σκυλί(ον)*, dog. Aristotle, *σκυλίον*, name of a fish, 565a 16-26; 566a 19.

According to Aristotle the ova of the *σκυλίον* are grown fast between the branches of the oviduct about the backbone; as these ova increase in size they change their position and move around into one or the other branch of the oviduct, which is forked and grown fast to the *ἐπέζωμα* (diaphragm, peritoneum) just as in other similar fishes. The oviduct of both this and the other Galeodes has at a little distance from the *ἐπέζωμα* a kind of white breasts (oviducal glands) which are not present when they are not pregnant. The shells of their eggs are shaped like the tongues (reeds) of pipes (*ὠλοί*), and there are attached to them hair-like ducts. The other *γαλεοί* breed twice a year, but the *σκυλίον* only once.

4. *Catulus stellaris* (L).

Apost. 5, 6 (*Scyllium catulus*), † *γάτος* = *ζάτος*, cat. Byzantine and Roman times, *ζάττα*, *ζάττος*; Latin, *catta*, Martial 13, 69.

I find no ancient application of this name to a fish.

Family **ALOPIIDÆ.**5. *Alopias vulpes* (Gmelin).

Apost. 6, † *σκυλόψαρο*.

Family **CARCHARIIDÆ.**6. *Carcharias ferox* (Risso).

Apost. 6. (*Odontaspis ferox*.)

Family **LAMNIDÆ.**7. *Lamna cornubica* (Gmelin).

Apost. 6, † *σκυλόψαρο*.

8. *Isurus oxyrhynchus* (Rafinesque).

Apost. 6 (*Oxyrhina spallanzani*), † *σκυλόψαρο*.

9. *Carcharodon carcharias* (L).

Apost. 6 (*Carcharodon lamia*), † *καρχαρίας*, † *λάμια*. See Athen. vii, 76. Athenaeus quotes several passages from ancient authors where the name *καρχαρίας* occurs, and among them the following from Nicandrus the Colophonian in his "Glosses:" "The *καρχαρίας* is called also *λάμια* and *σκόλλα*."

The word *ζαρχαρίας* itself is from *ζάρχαρος*, sharp, or sharp-toothed. The *Lamia* and *Seylla* were fierce man-devouring monsters of Greek myth.

Family **GALEORHINIDÆ**.

10. *Galeus canis* (Mitchell).

Apost. 7. (*Mustelus vulgaris*.)

11. *Galeus mustelus* (L).

Apost. 7. (*Mustelus laevis*) *γαλιός*.

12. *Carcharhinus glaucus* (L).

Apost. 7. (*Carcharias glaucus*.)

Family **SPHYRNIDÆ**.

13. *Sphyrna zygaena* (L).

Apost. 7 (*Zygaena malleus*), † *ζόγαινα*. Mentioned by Arist. 506b 10 among long fishes with the gall on the liver. Also mentioned by Epicharmus, Frag. 30.

I saw some fishermen catch a hammer-headed shark in the Bay of Eleusis, but all the names I could elicit were *κωνίχι* (?) possibly *κωνίχι* = little dog, and *ἀγροόφαρο* = fierce fish.

14. *Sphyrna tudes* (Cuvier).

Apost. 7 (*Zygaena tudes*), † *πατερίσσα*, crutch, bishop's staff.

Family **HEXANCHIDÆ**.

15. *Heptanchias cinereus* (Gmelin).

Apost. 7. (*Heptanchus cinereus*.)

Family **SQUALIDÆ**

16. *Squalus acanthias* (L).

Apost. 8. (*Acanthias vulgaris*) † *σκολόφαρο*.

17. *Squalus blainvillei* (Risso). II. *Γαλιός*(ς) (1).

Not noticed by Apostolides. Apost. 7 gives *γαλιός* as common name for *Mustelus laevis*. *Γαλιός*, *γαλειοειδής* and *γαλιώδης* all occur quite frequently in Aristotle. 505a 15, 489b 5 and 6, 511a 4-6, 1529a 29, 621b 16, 565b 28, 543a 17, 566a 17, 565a 26, 754b 33, 565b 2ff, 508b 17 (Here *γαλιή* is probably the proper reading, M. G. *γάλια*, *Lota fluviatilis*. Cf. Aelian xv, 11, Bonitz.), 565a 20, 566a 31, 565a 14, 540b 19, 505a 18, 505a 5, 506b 8, 507a 15, 540b 27.

According to Aristotle the *γαλιόι* are the long *σελάχη* with uncovered gills on their sides (sharks), as distinguished from the flat *σελάχη* with uncovered gills underneath them (rays). The *γαλιόι* are ovoviviparous, produce at the most three young at a time, and admit their offspring

into themselves (into their mouths) and let them out again. The *ποικίλος* and *ἀλωπεκίας* do this especially, but others do not because of their roughness. The *γαλεοί* have a mouth opening wide (literally 'breaking back'). The *ἀκανθίας* (thorny) *γαλεός* has its ova attached to the *ὀπόζωμα* (peritoneum [?]) above the oviducal glands, and when the ovum descends upon its having been loosed the young fish is produced. In the same way generation takes place in the *ἀλώπηξ*. But the so-called smooth *γαλεοί* have their ova between the branches of the oviduct like the *σολίον*. The ova moving about descend into one or the other branch of the oviduct and the young are produced, having the umbilical cord attached to the oviduct, so that when the eggs are used up these fish seem to have an embryo just like the quadrupeds. In the case of the *σολία*, which some call *νεθρία γαλεοί* (i. e. *γαλεοί* dappled like a fawn, fawn-colored sharks), when the shell of the egg bursts and falls off the young fish is born. There are several kinds of *γαλεοί*, e. g. *ἀστειρίας*, *κεντρύνης*, *ἀκανθίας*, *λεῖτος*, *ποικίλος*, *σχύμνος*, *ἀλωπεκίας*. See Athen. vii, 43.

In 508b 17 *γαλεοί* are mentioned among fishes which have many pyloric appendages, but this is thought to be a corrupted reading for *γαλῆ*. See above under references.

The *γαλεοί* and *γαλεοειδεῖς*, as *ἀλώπηξ* and *κόων*, and the flat fishes, *νάρχι*, *βάτος*, *λειόθατος* and *τρογγών* produce their young alive, having first produced eggs internally. The form of the uterus (oviduct) must be seen from dissections. The *γαλεώδη* have it different from one another and from the flat *σελίγγι*. For in some cases the ova are grown fast around the back bone between the branches of the uterus (oviduct, *ὀστέρα*), just as has been said in the case of the *σολίον*. As the ova increase in size they move around. The uterus being forked and grown to the *ὀπόζωμα* (diaphragm, peritoneum) just as that of others of this kind, the ova come around into one or the other branch of the uterus (oviduct). Both the uterus of this and that of the other *γαλεοειδεῖς* at a little distance from the *ὀπόζωμα* have what resembles white breasts (oviducal glands) which are not present when they are not pregnant.

The *γαλεώδεις* all have their gills double and five on each side. They also have the gall bladder on the liver, and the two parts of the liver are independent, the beginning not being grown together. The males differ from the females by having two appendages hanging about the vent.

18. *Oxynotus centrina*.

Apost. 8 (*Centrina vulpecula*), γουρουνόψαρο.

The word is M. G. and means hog-fish. So A. G. χοῖρος, hog, was used as name of a fish found in the Nile. Strabo 823, Athen. 312 A. (vii, 88).

I saw the γουρουνόψαρο in the market at Athens and heard the name from the market men, but the specimen was too large to be preserved.

Family **SQUATINIDÆ**.19. *Squatina squatina* H. * ρίνα (1), * σαρσάλλα (1).

Not noticed by Apostolides; ρίνα (v. l. ρίνα), Arist. 543b 9, 540b 11, 746b 6, 543a 14, 565b 25, 1529a 16, 697a 6, 620b 30 31, 506b 8, 566a 20 22 27, 622a 13.

The ρίνα is one of the σελάχη, has the gall on the liver, has a large tail and copulates belly to belly. It breeds twice a year, in autumn and again about the setting of the Pleiades, producing seven or eight young each time. It allows its young to pass in and out (of its mouth). The ρίνα seems to cross with the βάτος and produce the fish called βινόβατος. This has the head and fore parts of the βάτος but the rear parts of the ρίνα, as if born from both. Like the ὄνος, βάτος and ψήττα it buries itself in the sand and then waves the filaments in its mouth. It changes its color to that of the rocks on which it is, or to that of its other surroundings, so that it is not easily seen.

Athen. vii, 89, says the λευκόβατος (smooth βάτος) is also called ρίνα.

Family **RHINOBATIDÆ**.20. *Rhinobatus columnæ* (Muller & Henle).

Apost. 8. † Καλιάνι.

Family **TORPEDINIDÆ**.21. *Torpedo torpedo* (L).

Apost. 8 (*Torpedo marmorata*), † μουδιάστρο, from M. G. μουδιάζω, to benumb. Compare ancient νάρχη, Aristotle, 506b 9, 505a 4, 540b 18, 566a 32, 695b 8 9, 696a 27, 1527b 40, 1530a 12, 696a 31, 695b 11, 620b 19 29, 1530a 15, 543b 9, 566a 23, 565b 25, 620b 20 26.

Νάρχη means *numbness, torpor, stiffness*. The verb ναρκιάω means to *grow numb, to be stiff*, Lat. *torpere*.

Arist. gives the following points with regard to the νάρχη :

It is a flat σέλαχος and like all such has its gills underneath it and is ovoviviparous. It has the gall on the liver, has a long spiny

tail. It has its dorsal fins transferred to its belly, where, on account of its shape, they will be more useful, and its *belly* (ventral and pectoral [?]) fins near the head. It has two fins near (or on) its tail. For two fins it uses its flat edges. The *νάρκη* benumbing (*νάρκῶν ποιῶσα*) the fishes which it intends to catch, taking them into its mouth in the way which it has, feeds on these. It buries itself in the sand and mud and captures the fishes swimming up to it, which it stuns (*νάρκῶν ποιεῖ*). A proof that they live in this way is that they are often caught having in them the *ξεστρεῖς*, one of the swiftest of fishes, the *νάρκη* itself being one of the slowest. Some persons have been eye witnesses of their mode of capturing their prey. It is well known that they stun people also. It hunts little fishes for its food, catching them by rendering them numb (*νάρκῶν*) and unable to move. The *νάρκη* and *ρίνη* spawn a little before the autumnal equinox. They take their young into themselves (their mouths) and let them out again. A large *νάρκη* has been seen with about 80 young in it.

Aristotle frequently mentions it in close connection with *τρογγών*, *βιάτος* and *ρίνη*, implying that they belong to the same general class.

See also Athen. vii, 95, where the same facts with regard to its stunning power are repeated. Theophrastus says it can send a shock even up through a fish-spear to a man's hand.

Family **RAJIDÆ.**

22. *Raja clavata* (L).

Apost. 8.

23. *Raja batis* (L).

Apost. 8 (*Raja batis*), *βατί*. *Βατί* = *βατί(ον)* is the natural M. G. equivalent for A. G. *βιάτος*.

24. *Raja punctata* H., *βιάτος* (1).

Apost. 8 (*Raja punctata*).

The *βιάτος* is repeatedly mentioned in Aristotle. 489b 6, 489b 31, 505a 4, 540b 8, 565b 28, 566a 28 32, 599b 29, 620b 30, 695b 28, 696a 25, 697a 6, 709b 17, 746b 6.

According to Aristotle the *βιάτοι* form one division of the *σελίχη*, are flat, have a tail (*ζέμπος* = tail like that of a quadruped. The word *ζέμπος* is not applied to the tail of a fish, such as a sunfish, etc.); they have uncovered gills (no opercula), have no scales, but a rough skin; they have no fins but "swim by means of their flatness itself," or, as is said in another place, by means of the outer

edge of their flatness. They have their gills *under* them, whereas the γαλεώδη have them in the side. The flat selache with tails, as the βάτος, τρογών and the like, copulate not only with belly to belly, but also by mounting with their bellies upon the backs of the females in those kinds in which the tail is not so thick as to be in their way. Of the flat fish the βάτος and τρογών do not receive their young into themselves because of the roughness of the tail. Some fishes lie quiet in the sand, others in the mud, keeping only the mouth above. The πετραῖοι, βάτοι and σελαχώδη lie hid during the wintriest days. The ὕνος, βάτος, φήπτα and ῥύνη bury themselves in the sand, and when they have made themselves invisible they wave (ῥαβδέεσται) those things in their mouths which the fishermen call "rodlets" (ῥαβδία) or little wands. None of the other fishes have been seen uniting in copulation with others not of their own kind; but the ῥύνη and βάτος alone seem to do this; for there is a fish called ῥινόβατος, because it has the head and fore-parts of the βάτος but the hind parts of the ῥύνη, as if born from both of these. The γαλεοί and γαλεοειδέεις, as the ἀλώπηξ and νόων, and the flat fishes, νάρκη, βάτος, λειόβατος and τρογών, are viviparous, having produced eggs (internally), i. e. are οονοβίπαροι. Βατίς also occurs in Aristotle. It may be merely a feminine form of βάτος used as a name of female βάτος. 1527b 41 43, 565a 22 27, 567a 13. "The σκολία and βατίδες have shelly arrangements in which is found an eggy fluid. The form of the shell is like that of the tongues (reeds) of wind-instruments (pipes, ἀόλοι), and there are hair-like ducts attached to the shells. In the case of the σκολία, which some call νεβρίαι γαλεοί, the young are produced whenever the shell breaks from around them and falls off; but in the case of the βατίδες whenever they lay the eggs the young comes forth from the shell, which has been broken off from around it." 565a 22ff. (The above passage is obscure and possibly corrupt. I do not understand the distinction made in the latter part.)

In 567a 13 Aristotle says that the female seal has a pudendum like that of the θατίς.

25. *Raja miraletus* H., σελάχι (Γ).

Apost. 9 (*Raja miraletus*). Σελάχι, according to Apost., is a collective name for all species of rays.

Arist. σελάχος, commonly in plur. σελάχη. 511a 5, 695b9, 489b2, 516b 16, 655a 23, 732b 1, 754a 23, 476a 2, 732b 22, 520a 17, 538a 29, 540b 6, 755b 2, 598a 12, 591a 10, 697a 7, 516b 15, 516b 36,

655a 23, 696b 3 6, 697a 8, 517a 1, 476a 2, 489b 6, 505a 1 3 5, 695b 4, 489b 30, 676b 3 4 5, 520a 17 18 19, 564b 20, 718b 35, 733a 10, 754a 33, 733a 8 11, 537a 30, 535b 24, 538a 29, 540b 19 10 12, 621b 25 28, 570b 32, 489b 16, 718b 33, 754a 23 32, 564b 15 16, 492a 27, 503b 3, 511a 4 7 9 12, 516b 15, 475b 20, 676b 2, 718b 32, 732b 1, 754a 23, 755a 12, 755b 2, 676b 2, 566a 24, 570b 32, 566a 15, 565b 30, 566a 26, 571a 1, 540b 14, 755b 8 12, 539a 29, 505a 26, 489b 6, 540b 17, 505a 3, 517a 1, 540b 6 8 10 12 17, 565b 28, 489b 30, 565b 24-31, 695b 9, 1527b 40 44. Cf. also *σελαχώδεις*.

Σελαχος is a term much used by Aristotle in a broad sense to include a wide variety of fishes. *Σελαχώδης* is also used, whether as equivalent to *σελάχος* or in a still more comprehensive sense, is not clear. Pliny ix, 24 (78), says: "There is another kind of flat fishes which have cartilage for the spine (*pro spina*), as the *raia*, *pastinaca*, *squatina*, *torpedo* and those which the Greeks call by the names *bovis* (*βουῖς*), *lamia*, *aquila* (*ἀετῶς*), and *rana* (*βάτραχος*), in which number are also the *squali* although these are not flat (*plani*). All these collectively Aristotle called *σελάχη*, he first having given them this name. We (Latins) can not give them a distinctive name unless we may be permitted to call them cartilaginous (*cartilaginea*)."

I gather the following points from Aristotle: Any animal is called a *σελάχος* which, being without feet and having gills, is viviparous (or ovoviviparous). All the *σελάχη* except the *βάτραχος* are externally viviparous, having first produced eggs within themselves (i. e. are ovoviviparous).

Their uterus, or oviduct, is forked and extends to the *δπόζωμα* (diaphragm, peritoneum).

The *σελάχη* are *βάτιος*, *τρογών*, *βίση*, *βουῖς*, *λάμια*, *ἀετῶς*, *γάρις*, *βάτραχος* and all the *γαλεοί*. They have uncovered gills; some are elongated in form, e. g. the *γαλεοί*; others flat, e. g. the *βάτιοι*. Some of the *σελάχη* do not have fins, viz., the flat ones and those having tails, such as *βάτιος* and *τρογών*. These swim by means of the "flatness itself." But the *βάτραχος* has fins, and so do all which do not have the flat parts thin. Some are rough, others smooth. The viviparous fishes, such as the *σελάχη*, have cartilaginous bones (are *χόνδρομακθού*), but the oviparous ones have a spine like the backbone (*ράχης*) of quadrupeds. The liver of the *σελάχη* becomes fatty and an oil is melted from it, although the *σελάχη* themselves are very free from fat both in their flesh and abdomen.

They sleep at times so that they are even caught with the hand; they take their young into their mouths, except the *βιάτρωχος*, are purely carnivorous, and most of them have no pyloric appendages; the female is larger than the male, and the males can usually be distinguished from the females by two appendages hanging near the vent.

All the *σελαχώδη* have at the same time ova in great numbers above near the *ὑπόζωμα*, some larger and others smaller, while they already have embryos below. They are rough and without scales. They lie torpid during the wintriest days.

Galen vi, 737, derives the name *σελάχος* from *σέλας*, a bright light or blaze, or shining. He says: "The skin of such creatures is rough and shining in the night, wherefore also some say they have been named *σελάχια* from having *σέλας* (a phosphorescence).

26. *Raja undulata* (Lacépède).

Apost. 9.

27. *Raja fullonica* (L).

Apost. 9 (*Raja chagrinea*).

Family AËTOBATIDÆ.

28. *Aetobatis aquila* (L).

Apost. 9 (*Myliobatis aquila*). † *ἄετός* = eagle, Lat. *aquila*. Arist. 540b 18 mentions *ἄετός* as one of the *σελάχη*. Compare Plin. N. H. 9, 78, *aquila*.

29. *Aetobatis bovina* (Geoffrey St. Hilaire).

Apost. 9 (*Myliobatis bovina*). *Νελιδόνα*, in some parts of Greece. *Νελιδόνα*, the swallow, is also a common M. G. name for *Trigla hirundo*, as I found in the market at Athens.

Family DASYATIDÆ.

30. *Dasyatis pastinaca* (L).

Apost. 9 (*Trygon vulgaris*). † *Τρωγών* at Paros, † *μότρωουδα* at Chalcis. Arist. 598a 12, 1527b 40, 695b 9 28, 489b 31, 540b 8, 565b 28, 566b 1, 540b 8, 620b 24. Athen. viii, 21. Lat. *Trygon*, Plin. 9, 155.

Τρωγών as a bird is the turtle-dove. The fish called *τρωγών*, says Arist., is a flat *σελάχος* with no fins, but swimming by means of its flat parts, has a rough tail, does not admit its young into its mouth, is pelagic, buries itself in the sand.

Family MANTIDÆ.

31. *Mobula edentula* (Brünnich).Apost. 9 (*Cephaloptera giorna*).

Family CHIMÆRIDÆ.

32. *Chimæra monstrosa* L.

Apost. 9.

Family ACIPENSERIDÆ.

33. *Acipenser sturio*.Apost. 10 (*Acipenser sturio*), † *στούριον* at Corfu.

Family SILURIDÆ.

34. *Silurus glanis* (L).

It is not known that this species really occurs in Greece.

35. *Parasilurus aristotelis* (Agassiz).

Apost. 31 (*Silurus glanis*). † *Γλανός*, called † *γουλιανός* (g(oo)l-(y)anós) at Larissa, where it is caught in the Penēus River. *Γλανός* at Vrachori. Aristotle 505a 17, 490a 4, 506b 8, 568b 15ff, 608a 3 4, 568a 22 b 22, 568a 25 b 14, 569a 3, 621a 21 b 2, 602b 22 24.

This species is identified by Apost. with the *γλάνις* of Aristotle. Agassiz and Garman refer Aristotle's account to *Parasilurus aristotelis*, found in the Achelōis River, in Acarnania, Greece.

The *χορδύλος*, says Aristotle, swims with its feet and tail, and, to compare a small thing to a great, has a tail like the *γλάνις*. Some fish have four gills, each double except the last, as for instance *ζίγκη*, *πέριξη*, *γλάνις*, *χοπρίνος*. The *γλάνις* has the gall on the liver. The *γλάνις* and *πέριξαι* emit the bunch of eggs (*τὸ κόχμημα*) united just as the *βιάτραχοι* do. The larger *γλάνις* lay their eggs in the deep places, some even a fathom deep, but the smaller ones lay them in more shallow water, usually near the roots of a willow or some other tree; also near the reed and the *βρόιον* (some kind of a weed). The growth of the *γλάνις* from the egg is very slow, wherefore the male watches them forty or fifty days that the offspring may not be devoured by the little fishes which happen along. The egg of the *γλάνις* is, when laid, as large as a grain of vetch. No pestilential (universal?) disease attacks the fishes of rivers and ponds, but peculiar diseases fall on some of them, as the *γλάνις* especially,

because it swims near the surface, becomes star-struck in the time of the dog-star; it is also stupefied by loud thunder. The γλίανεις in the shallows are destroyed in large numbers by being struck by the dragon-serpent. The river and lake fish are best after the emission of the eggs and semen, when they recover their flesh. The γλίανεις is not good while pregnant. In all the rest the males are better than the females, but the female γλίανεις is better than the male.

Of the river fishes the male γλίανεις bestows much care upon its young. The female departs when she has laid her eggs, but the male, remaining where most of the eggs collect, keeps guard over them, affording no other assistance except preventing the other small fishes from seizing the offspring. It does this forty or fifty days until the young, having grown, are able to escape from the other fishes.

Family **CYPRINIDÆ**.

36. *Cyprinus carpio* (L).

Apost. 30-31 (*Cyprinus carpio* and *collari*), called † πιατίτσα in Thessaly.

37. *Carassius auratus* (L.)

Apost. 31 (*Carassius auratus*), † ζοκκινόψαρο, red-fish.= † χρυσόψαρο, gold-fish. Κόκκινος is used of a light or yellowish-red, even of a yellow color, e. g. ζοκκινόδι τοῦ αἰγῶν is yolk of the egg.

38. *Barbus meridionalis* (Risso).

Apost. 31.

39. *Tinca tinca* (L).

Apost. 31 (*Tinca vulgaris*).

40. *Leuciscus cephalus* (L).

Apost. 31 (*Squalius cephalus*).

Family **CLUPEIDÆ**.

41. *Harengula aurita* (Cuv. & Val.) H. * Φρίσσα (ι), λάμπρινα (ι).

Apost. 31 (*Sardinella aurita*), † φρίσσα, † θρίσσα. † συμροδελομιάνα (mother of the sardine); † ζέππα at Corfu. Arist. 621b 16, 1528a

40. Athenaeus vii, 137.

Aristotle speaks of the θρίσσα as one of the more bony fishes. Athenaeus says Χαλκίδες and the like, θρίσσαι, τριχίδες, ἐρίτιμοι. Dorio mentions the river θρίσσα and calls the τριχίς τριχίας.

Plainly *θρίσσα* (*θρίχια*), *τριχίς* and *τριχίας* are all derived from *θρίξ* (gen. *τριχός*) hair. *Φρίσσα* and *φρίσσα* are corruptions of *θρίσσα*.

42. *Harengula phalerica* (Risso).

Apost. 31 (*Meletta phalerica*), † *παπαλίνα*. A doubtful species.

43. *Clupea pilchardus* (L). II. *Σαρδέλα* (2). * *τριχίος* (1).

Apost. 32 (*Alosa sardina*), *σαρδέλα*. *Σαρδέλα* is It. *sardelli*. This would seem to be connected by derivation with Lat. *sarda*, Plin. 32, 151 and 46; *Sardina* Col. 8, 17, 12. *Σάρδη* and *σαρδήνη*, Galen. *Σαρδίνος*, Arist. 1531a 8, Athen. vii, 137.

Athenaeus says *Χαλκίδες* and the like, *θρίσσαι*, *τριχίδες*, *ἐρίπιμοι*. Epainetus, in his work on fishes, says *χαλκίδες*, which they also call *σαρδίνιοι*. Aristotle calls them (the *χαλκίδες* or *ἐρίπιμοι*) *σαρδίνιοι*.

It is evident from the above that the names *χαλκίδες*, *σαρδίνιοι*, *θρίσσαι* and *τριχίδες* were used for fishes similar to one another. This corresponds to the M. G. use of *θρίσσα* (*Harengula aurita*), *σαρδέλα* and *τριχίος*. *θρίσσα* and *τριχίδες*, M. G. *τριχίος*, are derived from *θρίξ*, Gen. *τριχός*, hair, and doubtless refer to the fine hair-like bones of the sardines. *Sardelli*, *sardinelli*, *σαρδίνιοι*, may be diminutives from *sarda*, and all these words obviously are derived from *Σαρδώ*, the A. G. name of Sardinia. Cf. Athen. iii, 92 for *σάρδα* resemble the *κολίαις* in size.

For *τριχίος* cf. *τριχίας* and *τριχίς* Arist. 569b 26, 598b 12, 543a 5, 1528b 1. The *τριχίας* breeds twice a year. From the Phaleric *κωβίτις* are produced *μεμβράδες*, from these *τριχίδες*, and from these *τριχίαι*. The *τριχίαι* are caught only as they swim into the Pontus, but they are not seen coming out of it. Whenever one is caught in the neighborhood of Byzantium the fishermen cleanse their nets thoroughly, because it is not customary for it to swim out (i. e. they cleanse their nets because the catching of one is so unusual a thing as to be considered an evil omen and contaminating).

The reason for this is that they swim up the Ister (Danube) to where it splits and then come down into the Adriatic. This is proved by the fact that there the reverse happens; for they are not caught going into the Adriatic, but only swimming out.

Athen. vii, 137, *τριχίδες*. Aristophanes Knights, 662. *Τριχίδες* a hundred for an obol (3 cents).

44. *Clupea alosa* (L).

Apost. 32 (*Alosa finta*).

45. *Clupea rufa* (Lacépède).

Apost. 32 (*Alosa vulgaris*).

Family **STOLEPHORIDÆ**.

46. *Stolephorus encrasicholus* (L.). H. *Γαῦρος (1).

Apost. 32 (*Engraulis encrasicholus*), † χαψί. Γαῦρος means proud, haughty, both in A. G. and M. G.

Family **SALMONIDÆ**.

47. *Salmo fario* (L.).

Apost. 33 (*Trutta fario*), † πῆστροφα.

Family **SYNODONTIDÆ**.

48. *Synodus saurus* (L.). H. Σαυρώς (2).

Apost. 32 (*Saurus fasciatus*), σαυρώς. I find nothing corresponding to it in the A. G.

49. *Aulopus filamentosus* (Bloch).

Apost. 32.

Family **PARALEPIDIDÆ**.

50. *Paralepis coregonoides* (Risso).

Apost. 32.

51. *Paralepis sphyrænoides* (Risso).

Apost. 33.

Family **ANGUILLIDÆ**.

52. *Anguilla anguilla* (L.). H. ἄλι (1).

Apost. 33 (*Anguilla vulgaris*), ἄλι, † σπυθλομύδαρι (spit-nose or awl-nose) at Missolonghi, † γλαβίτσα at Sciathus.

ἄλι is plainly the M. G. form of the A. G. ἔγγελλος. Arist. 489b 27, 534a 20, 505a 15, 506b 9, 507a 11, 517b 8, 538a 3 13, 696a 4 b 22, 1529a 37, 567a 20 21, 569a 6 8, 504b 30, 520a 24, 570a 3 15 24, 505a 27, 696b 22, 708a 4 7, 707b 28, 741b 1, 570a 13, 591b 30, 709b 12, 762b 23 28, 608a 5, 520a 24, 1529a 24-35, 569a 8, 538a 11, 592a 3-27. The ἔγγελλος is elongated and smooth, has only two fins, these fins towards the gills. has four single gills on each side, has the gall on the liver, has a gullet (στόμαχος), but this gullet is small, has but little fat about the stomach and caul, is neither male nor female, and does not engender anything from itself, as none of

them has ever been found with eggs in it. What they call a difference of male and female in the ἐγγέλιος, in that the so-called male has the head larger and longer and the female small and pug-nosed, is not a difference of sex but of species. All male fishes have milt (θόρος) except the ἐγγέλιος, but this has neither eggs nor milt. The ἐγγέλιος passes from the lakes into the sea. They are not produced either from copulation or eggs. In some marshy lakes when the water has all been drained off and the mud has been scraped out the eels (ἐγγέλεις) make their appearance again when the rain water collects. They are not produced in the dry places, neither in the permanent lakes, for they live and are nourished by the rain water. Some persons suppose they are produced from the little worms found in some ἐγγέλεις. This is not true, but they are produced from the so-called "entrails of the earth" (earth-worms), which originate spontaneously in the mud and moist earth. Some (eels) have already been seen coming out of these (earth-worms), and others may be seen in those pulled to pieces. But in the sea and in rivers such things are produced, especially where there is putrefaction, in the sea weed of the sea, and about the margins of rivers and ponds where the heat is intense.

The ἐγγέλιος requires pure water and soon suffocates in foul water. The eel-raisers (ἐγγελοτρόφοι) keep the water constantly flowing in and out of their tanks. Those who fish for eels (ἐγγέλεις) stir up the water. The ἐγγέλεις which have died do not come up and float on the surface like most fish, for they have the stomach (χοιλία) small. (Possibly χοιλία, literally hollow, here means swimming bladder.) A few of them have fat, but most of them have not. They live five or six days out of the water, more when they are northern, fewer when southern. If transferred in spring from the lakes to the tanks they die, but not so in the winter. They do not endure violent changes of temperature, dying if plunged into cold water. Some live seven or eight years. The river ἐγγέλεις take food, devouring one another and plants and roots, and whatever they find in the mud. They feed mostly at night, but during the day they retire into the depths. Those which men call the females are the better; but they call them so by mistake, they being of different species.

The word ἐγγέλιος is at least as old as Homer (Il. 21, 203 and 353), and is probably cognate with the Latin *anguilla* and English *eel*.

Family CONGRIDÆ.

53. *Ophisoma balearicum* (De La Roche). II. * Ζαλούπαροδος (1).

Not seen by Apostolides. If the word is genuine Greek it must mean foam-leopard or storm-leopard, from ζάλη (ζάλος), surging, foam, storm, and πάροδος.

54. *Leptocephalus conger* (L). II. Μουγγροί (1).

Apost. 34 (*Conger vulgaris*, variety *Conger niger*), μουγγροί, † ἄρόγγρα at Missolonghi. The γόγγρος of Aristotle 489b 27, 590b 17-19, 505a 27, 505a 14, 696a 4, 708a 3, 507a 10, 506b 18, 571b 1, 571a 28, 599b 6, 707b 28, 591a 6 10 18, 610b 15-17, 598a 13.

All those fishes which are long and smooth, as the ἐγγέλιος and γόγγρος, have only two fins. Some fishes have two gills on each side, the one single and the other double, as e. g. the γόγγρος and σκάρος. Some of the γόγγροι have the gall upon the liver, others below, separated from it. A few of the fishes have a gullet (στόμαχος), as e. g. the γόγγρος and ἐγγέλιος, and these have it small. (For στόμαχος = ολόσφαγος cf. 495a 18 b 19, 496a 2.) Only those fishes which lay the crumbling spawn (τὸ φθουρόν φόν) have thin scales (λεπίδες). For the γόγγρος does not have such spawn, neither does the μύραινα nor the ἐγγέλιος. The γόγγροι also have egg-masses (κωμάματᾶ), but the egg-mass is not very apparent on account of the fat. It has a long egg-mass just as serpents have. But when placed upon the fire it makes its nature evident, for the fat smokes and melts but the eggs jump and crackle when squeezed out. And besides, if a person feels and rubs them with his fingers the fat feels smooth, but the spawn rough. Now some γόγγροι have fat but no spawn, while others, on the contrary, have no fat and much spawn, as has just been described. The κάραβοι (Spiny lobsters?) overpower the γόγγροι; for on account of the roughness of the κάραβοι the γόγγροι do not slip away from them. The γόγγροι, however, devour the πολύποδες, for the πολύποδες cannot manage them on account of their smoothness. Some πολύποδες have their arms (πλεκάνας, coils) eaten off by the γόγγροι. The μύραινα, ὄρφος and γόγγρος also hibernate (φωλοῦσιν, lie quiet or torpid). Frequently the ζεσπερέις and the γόγγροι live when the tail has been taken away up to the vent. The ζεσπερέις is eaten off by the labrax and the γόγγρος by the μύραινα. The battle is to the stronger against the weaker, for the stronger devour the weaker. Some of the fishes change their places from the open sea to near the land and from the

land to the open sea, avoiding the extremes of cold and heat. The *τρογών*, *σελάχη*, white *γόγγροι*, *χάνη*, *ἐρυθροῖνος* and *γλαῦκος* are pelagic (*πελάγιοι*); but the *φάγροι*, *σκόρπιοι*, black *γόγγροι*, *μόραινα* and *κόκκυγες* change from one place to the other. Some of the long and thick fishes, as the *ἐγγέλυς*, *γόγγρος*, etc., do not have the fins on the belly (i. e. the ventral and anal fins). They all eat one another (except the *ζεστρεύς*), and the *γόγγροι* especially do so. Some have only two fins, as the *γόγγρος*, *ἐγγέλυς*, and a certain kind of *ζεστρεύς*.

Latin *Conger* cf. Plin. N. A. 9, 72, 9, 57, 9, 87, 9, 185. Also *gonger*, 32, 147.

Family **ECHELIDÆ**.

55. *Echelus myrus* (L).

Apost. 34 (*Myrus vulgaris*).

Family **OPHISURIDÆ**.

56. *Ophisurus serpens* (L).

Apost. 34 (*Ophisurus serpens*), † *εἶδος τῆς θαλάσσης*, serpent of the sea. Arist. *θαλάττιοι ὄφεις*, 505b 8 10, 621a 2.

The sea serpents (*θαλάττιοι ὄφεις*) are in other respects similar in form to the land serpents, but they have the head more conger-shaped; there are many kinds of the sea serpents, and they have every sort of color. They are not found in very deep places.

In the second reference Aristotle seems partly to contradict the above, saying, the sea serpent's color and body are similar to those of the *γόγγρος* except that it is of a duller color and more violent in its movements. If it is caught and let go it quickly goes down into the sand, boring through it with its beak. It has a sharper mouth than the serpents.

Family **MURÆNIDÆ**.

57. *Muræna helena* (L). H. *Σμέρνα* (1).

Apost. 34 (*Muræna helena*), *σμέρνα* and † *σμόρνα*. A. G. both *σμόρνα* and *μόραινα*. Arist. 707b 29 31, 489b 28, 540b 1, 517b 8, 540b 34, 696a 6, 1530a 9, 591a 12, 598a 14, 543a 25 29, 504b 34, 505a 15, 696a 6, 506b 16, 599b 6, 540b 1, 543a 20 23 24 28, 1530a 10, 1530a 8, 610b 17. Athen. vii, 90.

Σμόρνα is identical with the form *σμόρνα* given by Apost., as both spellings would be pronounced exactly the same in M.

Γ. *Σμέρνα*, the usual M. G. form and the only one which I heard, is plainly a corruption of the same word.

According to Aristotle the *μόραινα* is a *long* fish, does not have a crumbling egg-mass, has no scales, eats flesh only, is alternately pelagic and littoral, lies torpid for a season, is stronger than the *γόγγρος* and eats off the tail of the *γόγγρος*, has no fins, and uses the sea as serpents do the land; (*i. e.* moves through the sea in the same way as serpents move over the ground); its gills are not articulated like those of other fish; it has four single gills on each side, has the gall bladder on the entrails and is long like a snake; they copulate by twining around one another and bringing belly to belly like snakes, spawn at any and every season, lay many eggs, and the young grow rapidly. "The *σῦρος* and the *σῦραινα* differ, for the *σῦραινα* is variegated and weaker, but the *σῦρος* is of uniform color and strong, and it is colored like the pine tree and has teeth both within and without. People say, just as they say other things, that the one is male the other female. These come out on the dry land and are caught there frequently.

According to Athenaeus, Theophrastus says the *ἐγγέλος* and *μόραινα* can live a long time out of water, because they have small gills. Dorio says the river *μόραινα* has, like the *ὀλίστος*, only one spine. Some people claimed that the *μόραινα* came out on land and held intercourse with snakes, from which were engendered venomous *μόραιναί*.

Athen. vii, 91, *μῦρος*. There are two kinds, one black and the other reddish, but the black ones are best. Lat. *Muraena*.

In ancient writings the *μόραινα*, *γόγγρος* and *ἐγγέλος* are regularly mentioned together showing that there was some considerable resemblance to one another, and that they were regarded as all belonging to the same general class. In connection with the current report noted by Aristotle to the effect that of *μῦρος* and *μόραινα* one was male the other female, it is interesting to note that the same belief is current among the fishermen of Greece of the present day. I was told in the market at Athens that *Muraena helena* was the female and *Gymnothorax unicolor* was the male of the same species, both called *σμέρνα*.

58. *Gymnothorax unicolor* (De La Roche). H. *Σμέρνα* (1).

Not noticed by Apostolides. Said by the Greek fishermen to be the male, while *Muraena helena* is considered the female *σμέρνα*. For ancient references to the *σῦραινα* or *μόραινα* see *Muraena helena*.

Family **ESOCIDÆ**.59. *Esox belone* (L.). II. Ζαργάνα (1).

Apost. 32 (*Belone acus*), † βελονίδα, ζαργάνα. Aristotle makes frequent mention of a fish called βελόνη. Βελονίδα would be a natural M. G. equivalent for this. See Arist. 610b 6, 506b 9, 543b 11, 571a 2ff, 567b 18, 755a 33, 616a 32.

Βελόνη = needle. Cont. Lex. gives also βελονίδι and βελόνι as names for the needle-fish.

From Aristotle I glean the following statements with regard to the βελόνη :

It is a long fish (i. e. not flat) and has the gall bladder on the liver. It spawns in winter. When it is time for it to spawn it bursts open and so the eggs come out; for this fish has a sort of division (partition) under the belly and intestine (ῥήτρον) just as the snakes called τρυφάλαι have. After it spawns these parts grow together again. Its eggs are spread around it just as in the case of the spiders, for the female βελόνη lays them attached to herself, and if any one touches them they scatter. The βελόναι run in shoals. The halcyon seems to make its nest chiefly from the bones of the βελόνη.

See Athen. vii, 111, where βελόνη = ραφίς. Vide under ζατρολίδρα, σαζγοράφα, *Syngnathus acus*.

Ζαργάνα. Cont. Lex. ζαργάνη and σαργάνα, needle-fish. Ζαργάνη in A. G. means a braid, a basket. Arist. 610b 6, has σαργήνος mentioned among fish found in schools. This may easily be a mistake for σαροῦτος. Σαργήνος occurs also in Athen. vii, 313 and 321. The name seems to be a derivative of σαργός. Cf. also Athen. viii, 52, ραφίς or βελόνη, called also ἀβλεννής.

Family **EXOCETIDÆ**.60. *Scombrosox rondeletii* (Cuv. & Val).

Apost. 32.

61. *Exocetus volitans* (L).

Apost. 32 (*Exocetus volitans*), χελιδονόψαρο(ν), swallow-fish. The specimen sold me under the name χελιδονόψαρο(ν) was *Dactylopterus volitans*, Apost. 15, also given as χελιδονόψαρο by Apostolides.

Family **SYNGNATHIDÆ**.62. *Hippocampus hippocampus* (L).¹ II. Ἀλογάκι (1).

Apost. 11 (*Hippocampus brevirostris*), ἀλογάκι, little horse. This would seem to be the fish called ἑπτόζαυπος by the ancients. Aris-

¹Apostolides records also *Hippocampus guttulatus* Cuvier—probably an error in identification, as the American species is unknown in the Mediterranean.

totle does not mention the *ἵππόζαυρος*. The word was used by the poets as the name of a sea monster, half horse and half fish, on which the sea gods rode. As the name of a fish it seems to occur only in late writings. Its stomach was regarded as a poison of peculiar power and also as possessing medicinal and magic powers. See Menand. Incert. 211, Strabo 384, Philostratus 774, Dioscorides 2 3, Aelian N. A. 14, 20, Plin. N. H. 32, 58 67 83 93 109 113 139 149, 36, 26. The references in Pliny refer chiefly to the use of the Hippocampus and its ashes as a medicine. In none of the references which I have examined in either Greek or Latin is there anything given, so far as I can see, which helps to identify the animal. The only reason, so far as I know, for identifying it with the sea horse is the mythological use of the term and the fact that the first part of the name is undoubtedly *ἵππος*, horse. *Τὸ ζάυρος* occurs as the name of a sea monster in Lycophron 414. *Κάμπη* = caterpillar. *Κάμπτω* ✓ *ζαυμ* = to bend. These words may all be connected in origin and meaning.

Ἴπποζάυριον, Epicharmus 16, Ahr.

63. *Siphonostoma acus* (L.). H. *Κατρολίδρα* (2).

Apost. 11 (*Syngnathus acus*), *καπουρλίδα*, † *σαζζοράφα* (sack-needle).

Ραφίς (Gen. *ραφίδος*), needle, occurs as the name of a fish in Athen. vii, 111. In a quotation from Epicharmus occurs the expression *ὀξύρρηχοι ραφίδες*, sharp-billed *ραφίδες*. Dorio says "the *βελόνη* which they call *ραφίς*," needle. Arist. in the fifth book of Parts of Animals calls it *βελόνη*, but in his work on animals or fishes, having called it *ραφίς*, he says that it is toothless. Speusippus calls it *βελόνη*. Cf. *βελονίδα*.

64. *Typhle typhle* (L.). H. *Κατρολίδρα* (2).

Apost. 11 (*Siphonostoma argentatum*).

65. *Syngnathus æquoreus* (L.).

Apost. 11 (*Entelurus anguineus*) may be some other species instead of *S. æquoreus*.

Family MUGILIDÆ.

66. *Mugil cephalus* (L.). H. *Κέφαλος* (2).

Apost. 27 (*Mugil cephalus*), *κέφαλος*, † *γοβόλι* at Chalcis; at Missolonghi the males are called † *στειράδια*, the females † *μπάφες*.

Κέφαλος is common in Arist. See 543b 15, 567a 19, 570b 15, 591a 13-30, 602a 4, 1529b 17. The *κέφαλος*, according to Aristotle, is one kind of *ζεσπρέβς*. It begins to be pregnant in November or December and is pregnant thirty days; it has scales and is oviparous, feeds on mud or slime; like all the *ζεσπρέϊς* it is not carnivorous; these (the *ζεσπρέϊς*) are the only fishes which are not carnivorous, and have never been caught with any flesh in their stomachs. The fishermen never use flesh bait for them, but use barley-cake. The *ζεσπρέϊς* all feed on sea-weed and sand. The *κέφαλος*, which some call *χελών*, is a littoral fish. The *κέφαλοι* feed on mud, and for this reason they are heavy and slimy. The winter is beneficial to most fishes, but not so to the *ζεσπρέβς* and *κέφαλος*. The *κέφαλος* especially suffers from the rain and cold in winter. Their eyes become white and the fishes become blind and light in weight, and finally die. In the shallows at Nauplia and elsewhere many have been caught blind when there came severely cold weather. The eyes of many were white. Athen. vii, 77-79 under the heading *ζεσπρέβς* has many references to the *κέφαλος*, which is regarded as one kind of *ζεσπρέβς*. He says that Dorio in his work on fishes describes the marine division of the *ζεσπρέϊς* but does not consider the river *ζεσπρέβς*. He makes the kinds of marine *ζεσπρέβς* to be *κέφαλος* and *νηστίς*.

Hesychius, under the word *κέφαλοι*, says some of the *ζεσπρέϊς* are so called.

There is some confusion in regard to the relation of the *κέφαλοι* and *ζεσπρέϊς*, but in general the *κέφαλοι* are spoken of as a subdivision of the *ζεσπρέβς*. In some places, however, they seem to be distinguished from one another. *Κεσπρέβς* seems to have been used in a double sense, at times in a broad sense including the *κέφαλοι*, and again in a more restricted sense.

67. *Mugil capito* (L). H. *Κέφαλος* (1).

Apost. 27 (*Mugil capito*), † *λαγιάδες* at Chalcis, † *βελάνισες* at Aitolico. For ancient use of *κέφαλος* v. sub. *Mugil cephalus*. A fish seems to have been called *λαγός*, the hare, in ancient times, but I can find nothing definite about it. *Lepus marinus*, the sea hare, is very common in Pliny, where it is represented as exceedingly venomous. Vide Plin. 9, 155, 32, 9. The name most like *βελάνισες* are *βελώνη* and *βλέννος*. Of the latter Athen. vii, 29, says it resembles the *κωβιός* in appearance.

68. *Mugil saliens* (Risso).

Apost. 27 (*Mugil saliens*), † *μυξινάρι*, at Missolonghi and Chalcis. † *κεφαλάδες* at Volo. For *κεφαλάδες* compare *κέφαλος*. † *Μυξινάρι* would be natural M. G. form of *μύξων*, found in A. G. writings. Arist. 570b 2, 543b 15. Written also *σμούξων*. The name is from *μύξα*, mucus, slime; usually the mucous discharge from the nose. According to Arist. the *χελών*, *σάργος*, (*σ*)*μούξων* and *κέφαλος* are different kinds of *κεσπρέβς*. Athen. vii, 77, under *κεσπρέβς*, has as one kind *μυξίνος*. This is an inferior kind of *κεσπρέβς*, the *κέφαλος* being best.

69. *Mugil labeo* (Cuvier).

Apost. 27 (*Mugil labeo*), † *γάστρος*. † *Πλαταρίδα* at Chalcis. *Γάστρος* is obviously from *γαστήρ*, belly, and may mean big-bellied fish.

70. *Mugil chelo* (Cuvier).

Apost. 27 (*Mugil chelo*), † *χελώνια*. Arist. 543b 15, 570b 2, 1529b 17 19, 591a 23.

Of the *κεσπρέβς*, says Aristotle, the *χελώνες*, the *σάργος*, the one called *σμούξων* and the *κέφαλος* begin to be pregnant in December. The *κέφαλος*, which some call *χελών*, is littoral, but the *περαιάς* is not.

See also Athen. vii, 77.

71. *Mugil curtus* (Yarrell).

Apost. 27 (*Mugil curtus*), called at Missolonghi † *μαυράκι*, black, when small, and † *λευκόνοσ*, white, when full grown. This is a doubtful species, unknown to us.

It seems evident that *Mugil* is the *κεσπρέβς* of Aristotle and other A. G. writers, and that the *κέφαλος*, *μούξων* and *χελών* are species under this.

Family **ATHERINIDÆ**.72. *Atherina hepsetus* (L).

Apost. 27 (*Atherina hepsetus*), *ἀθερίνα*. Arist. mentions the *ἀθερίνη* 570b 15 and 571a 6; also *ἀθερίνος*, 610b 6. He says it lays its eggs near the land, rubbing its belly on the sand. The *ἀθερίνοι* are gregarious, i. e. they go in shoals.

73. *Atherina boyeri* (Risso). II. *Ἀθερίνα* (1).

Apost, 28 (*Atherina boyeri*).

74. *Atherina mochon* (Cuvier & Val). H. Ἀθήρινα (1).

Not noticed by Apostolides.

Family SPHYRÆNIDÆ.

75. *Sphyræna sphyræna* (L). H. Ἀσφύριος (1).

Apost. 28 (*Sphyræna spet*), Ἀσφύριος and † σφύρινα, the σφύρινα of Aristotle, 610b 5. The σφύρινα is gregarious.

Athen. vii, 122. The Attic Greeks call the σφύρινα κέσπρα. Speusippus says that the κέσπρα (or σφύρινα) βελόνη and σαυρίς are similar.

Family XIPHIIDÆ.

76. *Xiphias gladius* (L.)

Apost. 21 (*Xiphias gladius*), † ξιφίος. Hesychius gives ξιφίος as equal to ξιφίας. The name is derived from ξίφος, sword, and means sword-fish. For ξιφίας see Aristotle 1530a 17-21, 505b 18, 506b 16, 602a 26 30.

Arist. says of the ξιφίας: It has eight double gills on each side, and has the gall on the entrails; in the dog-days it has beside its fins a sort of little worm called οἰστρος, like a scorpion, as large as a spider. These cause them such pain that at times the ξιφίας leaps out of the water like the dolphin, and at times they even fall into boats.

Athen. vii, 96, says that Aristotle says: "The ξιφίας has the under part of its beak short but the upper part bony and large, equal to its whole size. This is called the sword (ξιφος), but the fish has no teeth."

Family ECHINEIDIDÆ.

77. *Echeneis naucrates* (L).

Apost. 22.

78. *Remora remora* (L).

Apost. 22 (*Echeneis remora*).

Family CORYPHÆNIDÆ.

79. *Coryphæna hippurus* (L.)

Apost. 21 (*Coryphæna hippurus*), † λαμπούρα, † μανάλια.

Family TRICHIURIDÆ.

80. *Trichiurus lepturus* (L).

Apost. 22 (*Trichiurus lepturus*), † *σπαθόψαρο*, blade-fish.

81. *Lepidopus caudatus* (Euphrasen).

Apost. 22 (*Lepidopus argenteus*), † *Ἰλιος* at Patras and † *Ἰλιαζας* at Corfu.

Family SCOMBRIDÆ.

82. *Scomber scombrus* (L).

Apost. 19 (*Scomber scomber*), *σχομβρί*.

83. *Scomber colias* (Gmelin). H. *Σχομβρί* (1), *σχομβρί* (1), * *τσῆρος* (1).

Apost. 19 (*Scomber colias*), *κολιός*.

The specimen which I bought as *κολιός* got lost, so that although I secured the name I can not be sure of the species to which it was attached.

Arist. *σκόμβρος*, 610b 7, 597a 22, 571a 14, 571a 12, 599a 2. The *σκόμβροι* copulate about April and spawn about July or August. The weaker animals always migrate first at each extreme of heat or cold, the *σκόμβροι* before the *θύννοι*, and the quails before the cranes. Frequently when the south wind blows against the *κολίαι* and *σκόμβροι* as they are swimming out of the Black Sea, they are caught below more than about Byzantium. *Κολίαι*, *σκόμβροι* and *πυλαμύδες* run in schools. Athen. vii, 116. Hicesius says the *σκόμβροι* are less in size than the *κολίαι*, but more nutritious. Arist. *κολίας*, 610b 7, 543a 2, 598a 24. The most of the *κολίαι* do not migrate into the Pontus but pass the summer in the Propontis and spawn, while they pass the winter in the Aegæan. The *κολίαι* are caught when they are passing into the Propontis, and in smaller numbers as they pass out. They are best in the Propontis before they spawn. The *σκόμβροι* and *κολίαι* (are gregarious) go in schools.

Athen. iii, 92. The *σάρδα* is like the *κολίας* in size.

84. *Gymnosarda alliterata* (Rafinesque).

Apost. 19 (*Thynnus thynnina*), † *τονίνα* at Chalcis.

The tunny (*θύννος*, fem. *θύννα* and *θύννις*), is probably mentioned oftener than any other fish in A. G. writers. Arist., *θύννος*, 488a 6, 505a 27, 591a 11, 537a 21 23, 543a 12, 571a 12 8, 607b 32, 607b 28, 599b 9 sq., 602a 31, 543a 1 b 3, 571a 15 14, 598b 19, 597a 22, 557a 27, 598a 18, 602a 26, 1531a 30, 844a. 29. *θύννις*, 591b 17, 610b 4, 1528b 6, 543a 9, 543b 12, 598a 26, 571a 10 15 18.

I glean the following points concerning the tunnies from Aristotle: The *θύγγαι* are migratory and run in schools, are smooth, purely carnivorous, and have the net thrown around them sometimes while asleep; the female has a fin called *ἀφαιρέσις* under the belly, but the male does not have it; they are at times burst by their fat. They live two years. The fishermen think this is proved by the fact that when the *θυγγίδες* failed one year the *θύγγαι* also failed the next year. They seem to be a year older than the *πυλαμύδες*. The *θύγγαι* and *σκόμβροι* copulate about the first of April and spawn about the last of June or first of July. They lay their eggs in a sort of sack. The growth of the *θυγγίδες* is rapid, When they spawn in the Pontus (Black Sea) there come from the eggs what some call *σχοροδύλαι*, but the Byzantians *ἀξίθες* (growers), because they grow (*ἀξάνω*) in a few days. They go forth (out of the Pontus) in autumn with the *θυγγίδες*, but return in the spring, being already *πυλαμύδες*.

An old *θύγγος* has been caught whose weight was fifteen talents (1350 lbs.), and whose length was five cubits and a span (about 8 ft.). The old ones are not good even for salt fish. The *θύγγαι* lie torpid in the depths of the sea in winter, and are plumpest after this hibernation. They begin to be caught about the beginning of summer (the rising of the Pleiades), and are caught last at the setting of Arcturus (winter solstice?). The *θύγγαι*, most of all fishes, take pleasure in warmth and come to the sand near the land for the sake of the warmth, because they warm themselves and swim on the surface. They spawn in the Pontus (Black Sea) and nowhere else, and but once a year. The *θύγγος* is good to eat again after Arcturus (probably the rising of Arct., about Sept. 15), for during this season it ceases to be afflicted with the *οἴστρος*, because of which pest it is inferior during the summer. The *θύγγαι* and *ξίφαι* are infested by the *οἴστρος* about the dog-days. At that time they both have by their fins a sort of little worm called *οἴστρος*, like a scorpion and as large as a spider (*ἀράχνης*). These cause them such pain that the *ξίφας* leaps out of the water at times no less than the dolphin. The *θυγγίδες* and *πυλαμύδες* enter the Pontus in spring and pass the summer there both for food and spawning. They come out straightway after the Pleiad (probably the setting of the Pleiades, about Nov. 10). If the wind is a southern one they swim out more slowly, but if northern more quickly, because the wind is then for wafting them on. They swim into the Pontus, keeping close to

favorable the land on their *right*, but they swim out of it keeping close to the land on the *left*.² The *σζόμβροι* are weaker than the *θόννοι* and migrate earlier. The *θωννίς* spawns in summer about the month Hecatombæon near the vernal equinox. It lays a sort of sack filled with many small eggs.

The above are, so far as I can make out, the main points which Aristotle reports concerning the *θόννοι* and *θωννίδες*. Whether they are the same, the latter merely referring to the females, is not altogether clear. It will be noted that some of the above statements are obscure and others contradictory, at least apparently so.

85. *Albacora thynnus* (L).

Apost. 19 (*Thynnus thynnus*), *μαϊάτιζο*. † *Γόφος* at Leucas, † *γλιωπέας* at Zante. *Μαϊάτιζο* means May (-fish). I saw this fish in the market at Athens and heard this name, but the fish was too large to take a specimen of it, the specimens which I saw being, if my memory serves me right, some five or six feet long.

86. *Gymnosarda pelamys* (L).

Apost. 19 (*Thynnus brachypterus*), † *ἀρζύνος* and † *κόπαιος* in the Gulf of Volo. *Κόπαιος* = a knocker, pounder, pestle. Aristotle has *ἀρζύνης* (*ἀρζύς*), 543b 5. He says they spawn in the open sea.

Athen. vii, 98, has *ῥορυνος* as name of a fish. "Dorio, in his work on fishes, says that the *ῥορυνοί* crossing over from the sea about the Pillars of Hercules come into our waters, wherefore most are caught in the Spanish and Tyrrhenian Seas (the sea west of Italy was called Tyrrhenian). From there they scatter throughout the rest of the (Mediterranean) sea. Hicesius says that those caught at Gadeira (Gades, Spain) are fattest, and next to these, those caught in Sicily; but those which are far from the Pillars of Hercules are poor, because they have swum for a greater distance." Aelian, Nat. An. i, 40, speaks of the *ῥορυνος* as a monstrous (*ζητῶδης*) fish very skilful in getting the hook out of its mouth when caught. According to Sostratus, Athen. vii, 66, the *ῥορυνος* is simply a *θόννος* grown very large. So also Archestratus, Athen. vii, 63.

87. *Sarda sarda* (L). II. *Παλαμόδα* (1).

Apost. 19 (*Pelamys sarda*), *παλαμόδα*. Aristotle has the name *πηλαμόης*,—*βόος*. 488a 6, 610b 6, 543a 1, 543b 2, 598a 26, 571a 19,

²Probably meaning on what is their left as they go in; for he proceeds to say that some persons assigned as the reason for this that they have keener vision in the right eye than the left, implying that they always keep the right eye towards the land.

571a 11. The *πηλαμύδες* are migratory and run in schools. The *πηλαμύδες*, *θωννίδες* and *ἀμύαι* run into the Pontus (Black Sea) in the spring and pass the summer there, spawning about the mouths of streams. The young of the *θωννίδες* are of rapid growth. In the autumn they go out of the Pontus with the *θωννίδες* and are then called *σχορδόλαι* (or *ἀξιδές*). The next spring they return, being already grown to be *πηλαμύδες*.

The general belief of the fishermen from whom Aristotle derived his information seems to have been that the *πηλαμύδες* were simply half-grown tunnies. The first year they were *σχορδόλαι*, the second year *πηλαμύδες* and the third year *θωννίδες* or *θόννοι*. Athen. vii, 66, reports that Sostratus says the *πηλαμύς* is called *θωννίς*, and when it gets larger *θόννος*, and still larger *ῥοζωνος*. Cf. Strabo 549, *χορδόλαγ*, *θόννη*, *πηλαμύς*. Pliny, 9, 47.

Family CARANGIDÆ.

88. *Trachurus trachurus* (L). H. *Κοζάλι (1).

Apost. 19 (*Trachurus trachurus*), *σαυρίδι*. Κοζάλι in M. G. means bone or little bone. Arist. (528a 9, 761a 21) uses *κοζάλιον* as name of the snail. For *σαυρίδι*: see under *Trachurus mediterraneus*.

89. *Trachurus mediterraneus* (Stemdachus). H. Σαυρίδι (2), *σαρπαγιός (1).

Not distinguished by Apostolides. Σαῦρος = lizard, is used as name of a fish by Aristotle 610b 5. It is gregarious. In Athen. vii, 120, the name is given as that of a fish, and it is substantiated by several quotations, but nothing is given which would help to identify the fish. Athen. vii, 122, says Speusippus represents the *ξέστρα*, *Βελόννη* and *σαυρίς* (acc. *σαυρίδα*) as similar. Σαυρίδι is a regular M. G. form of *σαῦρος*.

90. *Decapterus suareus* (Risso). H. *Κοζάλι (1).

Apost. 20 (*Caranx suareus*), *σαυρίδι κωνιγός*, hunter *σαυρίδι*.

91. *Naucrates ductor* (L).

Apost. 20 (*Naucrates ductor*), † *κουλιαγοῦζος*.

92. *Lichia glauca* (L). H. Λίτσα (1).

Apost. 20 (*Lichia glauca*), *λίτσα*.

93. *Lichia amia* (L).

Apost. 20 (*Lichia amia*), † *γκιζάρι*, † *γουζάρι*, † *γορφαρί*, † *λουζάρι*. Γόμφος (a bolt, pin or spike) and its diminutive *γομφάριον* were

ancient names for a fish. They are found in Tzetzes and Oppian or their scholia. See L. & S. under the words. Compare *γοφάρι, *Pomatomus saltatrix*.

94. *Lichia vadigo* (Risso).

Apost. 20.

Family POMATOMIDÆ.

95. *Pomatomus saltatrix* (L). H. *Γοφάρι (1).

The common Blue-fish of America; not noticed by Apostolides. This name is probably the same as γομφάρι reported by Apost. 20 as common name for *Lichia amia*, where see. The man who sold me the specimen probably did not distinguish it from *Lichia amia*.

The names are no doubt shortened from γομφάριον, a diminutive of γόμφος. This is proved by the existence of γομφάρι as a parallel form (see *Lichia amia*). Both γόμφος and γομφάριον occur in Tzetzes and Oppian (or their scholia) as the name of a fish.

L. & S. give γομφάριον = ζεσπερός and refer to Tzetzes ad Lycophronem 664, and Schol. Oppian H. 1, 112, 3, 339, and a gloss, γόμφος ἰχθύς. Γόμφος means a bolt, pin or spike.

Both γόμφος and its diminutive γομφάριον were clearly used as names of a fish or fishes; but the authority of Tzetzes, a Byzantine Greek of the Twelfth Century, A. D., or of a late scholiast on Oppian is not sufficient to prove that it meant ζεσπερός.

Family ZENIDÆ.

96. *Zeus faber* (L). H. Σαμπζέρο (1).

Apost. 21 (*Zeus faber*), σαμπζέρος, σαμπζέρις, † ζροσπεράρο (Christfish). The first three forms of the common Greek name seem to be corruptions of the French or Italian for Saint Peter.

97. *Zeus pungio* (Cuv. & Val).

Apost. 21.

98. *Capros aper* (L).

Apost. 21.

Family STROMATEIDÆ.

99. *Stromateus fiatola* (L).

Apost. 21.

Family CEPOLIDÆ.

100. *Cepola tænia* (L.). H. *ζροσζαλιῆδα (1).

Apost. 22 (*Cepola rubescens*), † τσιπουλια.

The name *Cepola tænia* has priority over *C. rubescens*. J.

Family TRACHYPTERIDÆ.

101. *Trachypterus spinolæ* (Cuv. & Val).

Apost. 23.

102. *Trachypterus trachypterus* (L).

Apost. 23 (*Trachypterus fulx*).

Family SERRANIDÆ.

103. *Dicentrarchus labrax* (L.). H. Λαβράξι (1).

Apost. 17 (*Labrax lupus*), λαβράξι (for all species of this genus).

Aristotle λάβραξ 489b 26, 534a 9, 537a 27, 543a 1 b 11, 567a 19, 570b 20, 591a 11 b 18, 601b 29-31, 607b 26, 610b 10, 1530a 1-4.

The λάβραξ has scales and is oviparous, as all fishes with scales are, is carnivorous, has two fins on its back and two on its belly, has an especially acute sense of hearing, is often speared in daytime while sleeping, spawns twice a year, once in summer and once in winter, spawns chiefly "where rivers flow," has a stone in its head, and in consequence of this is especially apt to suffer in winter, being frozen to death and cast ashore. They are not good for food when pregnant. The labrax and cestreus, although most hostile to one another, flock together at certain seasons. For frequently not only those of the same species flock together but also those whose food is the same or similar, if it is plenty. Athenæus, vii, 86. The labrax has a tongue that is bony and grown fast, and a triangular heart. It is the most intelligent of fishes, being quick to see a means of escape. Its name is derived from λάβρος, violent, greedy.

104. *Dicentrarchus punctatus* Bloch.

Apost. 17 (*Labrax punctatus* and *L. lupaster*).

105. *Serranus scriba* (L.). H. Ηξέρια (3).

Apost. 17 (*Serranus scriba*), πέρια.

Aristotle πέρια; 505a 16, 508b 17, 568a 20 22, 599b 8, 1528a 12. According to Aristotle the πέρια has four gills on a side, double except the last, just as is true also in case of the ζίχλη, γλίανθ and

ζυπρῖνος. It has many pyloric appendages, spawns in the stagnant parts of rivers and lakes, among the reeds; the eggs cling together in a large bunch and the fishermen gather them by unwinding them from the reeds.

The *ζίχλαι*, *ζόττοφιοι* and *πέριζαι* are given as *πετραῖοι*, or rock-fishes, and are said to hibernate and nest in pairs.

Athen. iv, 13. "Flowery-colored *πέριζη*." Vii, 110. Speusippus says that the *πέριζη*, *χάννα* and *φουκίς* are similar. Epicharmus calls them "gleaming." There was a proverb "The *πέριζη* follows the *μυλάωνρος*." Aristotle says that the *φουκίς* is thorn-crowned and variegated in color, but the *πέριζη* belongs to those which are adorned with lines and have bands on their sides.

106. *Serranus cabrilla* (L.) H. *Λάνος* (2).

Apost. 17 (*Serranus cabrilla*), *χάνος*. Cf. *χάννα* and *χάννη*. Aristotle 598a 13, 591a 10 b 6, 1528a 15, 538a 19 21, 567a 27, 755b 21, 760a 9. Most of the fishes are male and female, but concerning the *ἐρυθρῖνος* and *χάννη* there is a doubt, for all of these which are caught have eggs in them. The *χάνναι* are purely carnivorous; they often throw out their stomachs (*κοιλίας*) when pursuing the smaller fishes, because the stomachs of fishes are near to their mouths and they have no gullet (*σάμαχος*). The *χάννη* is pelagic. Athen. vii, 134. Epicharmus in the Marriage of Hebe says: "Wide-gaping *χάνναι* and monstrous-bellied *ἄνοι*." Aristotle calls it (the *χάννη*), variegated with black and red (or salmon) and adorned with lines, because it is adorned with dark lines.

The names *χάνος* and *χάννη* mean the gaper, √ *χαω*, to gape.

107. *Paracentropistis hepatus* (L.) H. * *Καψομοῦλα* (1).

Apost. 17 (*Serranus hepatus*), *πέριζα*.

108. *Mycteroperca rubra* (Bloch.) H. * *Μοσχουζάποδο* (1).

Not noticed by Apostolides.

109. *Epinephelus gigas* (Brünnich.) H. *Ῥοφός* (1).

Apost. 18 (*Epinephelus gigas*), *Ῥοφός* and † *ἄρφός*. Aristotle 591a 11, 598a 10, 599b 6, 543b 1, 1530b 27. Aristotle has the forms *ἄρφός* and *ἄρφός*. According to him this fish is of very rapid growth, is littoral, lies torpid for a season (in winter), and is purely carnivorous.

Aristophanes, Wasps, 493, speaks of the *ἄρφοί* as found in the markets of Athens.

Athen. vii, 97, ὀρφῶς and ὀρφός. It is sharp-toothed and solitary. It is a peculiarity of it that the seminal ducts are not found in it and that it can live a long time after it is cut up. It is one of those which lie torpid during the stormiest days, and is more fond of being near land than out in the open sea. Numenius calls it the *very rough* ὀρφός. Cf. also Athen. viii, 51.

Aelian Nat. An. v, 18, says: The ὀρφῶς is a sea fish, and if you should catch one and cut it up you would not see it dead immediately, but it still partakes of motion, and for no little time. They like to stay in holes throughout the winter. Cf. also Ael. Nat. An. xii, 1.

110. *Epinephelus chrysotænia* (Doderlein). H. Στήρα (1)

Not seen by Apostolides. Cf. Apost. 17, *Polyprion cernium*.

111. *Polyprion cernium* (Cuvier).

Apost. 17, στήρα.

112. *Anthias anthias* (L).

Apost. 18 (*Anthias sacer*).

Family APOGONIDÆ.

113. *Apogon imberbis* (L). H. Καλογρίσσα (1).

Apostolides 18 (*Apogon imberbis*). Cf. Apostolides 27, *Chromis castanea*.

Family SPARIDÆ.

114. *Diplodus vulgaris* (Geoffrey St. Hilaire). H. Σαργός (1), *σκαρογάϊδαρο, (1), *ἀδλιάς (1), σπάρος (1).

Apost. 23 (*Sargus vulgaris*), σαργός, †χαραζίδα. Aristotle σάργος (or v. l. σαργός), 543b 14 15 16, 570a 32 b 1 3, 543a 7 b 8, 591b 19 21, 1528a 24.

The σάργος spawns twice a year, in spring and in autumn; it is pregnant about thirty days in the month of December. The σάργος, χελών, ζέφαλος and σμύξων (or μύξων) are different kinds of ζεσπρεῖς, i. e. sub-classes of the ζεσπρεῖς. The σάργος feeds after the τριγλί. The σαργῖνοι (sargus-like fishes?) run in schools. Athen. vii, 93, says that Aristotle says the spotted-tailed fishes are μελάσσορος and σάργος, and they are much lined and dark-lined. Num. in Hal. says: "To laud, a σαργός, most 'line-jerking' of fishes." Lat. *sargus*. Plin. 9, 65 and 162. Ov. Hal. 105. Σάργος and σπάρος are also

found in Aristotle. Vide sub *S. rondeletti* and *S. vetula*, Apostolides 23.

Σαρογάϊδαρο is compounded of *σάρος* and M. G. *γάϊδαρο*, donkey, and means *scarus-donkey*.

115. *Diplodus sargus* (Gmelin).

Apost. 23 (*Sargus rondeletti*), *σάρος*.

The specimen sold me as *σάρος* was *Diplodus vulgaris*. I am inclined to think that the names *σαργός*, *σάρος* and *σάρως* are used indiscriminately for any and all species of *Diplodus*.

Aristotle, 508b 17, has *σάρως*, but a *vario lectio* is *σάρος*. He says the *σάρως* (or *σάρος* if we follow the other reading) has many pyloric appendages. Athen. vii, 114, mentions the *σάρως* and cites several passages from ancient writers in which the *σάρως* is named. One is from Epicharmus, in which *σάρως* can not be a mistake for *σάρος*, as both names occur connected by and, viz., "We fished for *σάρωσι* and *σάροι*." Cf. also Athen. vii, 52.

116. *Diplodus vetula* (Cuv. & Val.).

Apost. 23 (*Sargus vetula*), † *σάρος* cf. *σαρογάϊδαρο*, *D. vulgaris*.

Σάρος is common in ancient writers. Arist. 1531a 28, 621b 16, 1531a 10-17, 505a 28, 662a 7, 505a 14, 508b 11, 591a 14, 508b 12 17, 591b 22, 675a 3, 1528a 32, 621b 15.

According to Aristotle the *σάρος* has two gills on each side, one single and the other double, has its stomach shaped exactly like an intestine, seems to ruminate just as the quadrupeds do, is a bony fish, is the only fish whose teeth are not sharp and pointed, and is consequently with good reason held to be the only one that ruminates.

Athen. vii, 113, under *σάρος*, quotes Aristotle as saying that it is (not) sharp-toothed, and solitary and carnivorous; it has a small mouth and tongue, not grown fast much, etc. A passage plainly corrupt. To make any sense out of it at all we must assume that the negative near the beginning of the quotation has dropped out, and replace it. Otherwise it contradicts what Aristotle has repeatedly said elsewhere, and even contradicts the latter part of the passage itself, where it is said that the *σάρος* is fond of seaweed and is baited with this.

The statement that the *σάρος* chews its cud is made repeatedly in Aristotle and other ancient writers.

Nicander of Thyatira says there are two kinds of *σκάροι*, one of which is called *όνίας*, donkey-colored, the other *αΐολος*, brilliant.

This suggests *σαρογαΐδαρο*, 'scarus-donkey,' a name given to one of my specimens of *Diplodus vulgaris*. Moreover the names secured by me under *D. vulgaris* indicate that at the present time the names *σκάρος*, *σπάρος* and *σάργος* are all used more or less indiscriminately for all the species of *Diplodus*.

Scarus is frequent in Latin writers. Plin. 9, 62. Ov. Hal. 9, 119. Hor. Sat. 2, 2, 22, etc.

117. *Diplodus annularis* (L).

Apostolides 23 (*Sargus annularis*), † *σουβλομίτης* at Corfu. *Σουβλα* (or *σουβλί*) = awl, spit (for roasting meat). *Μίτος* = thread. The resemblance to a derivation from these words may be accidental.

118. *Charax puntazzo* (Gmelin). H. *Θόγαϊνα* (1).

Apost. 23 (*Charax puntazzo*), *θόγαϊνα*, *οόαϊνα*.

119. *Pagellus erythrinus* (L). H. *Λυθρίνι* (1), * *μπαλάς* (1).

Apost. 23 (*Pagellus erythrinus*), *λυθρίνι*, *λυθρινάρι*. For name *λυθρίνι* see under *Sparus pagrus*.

120. *Pagellus acarne* (Cuvier). H. * *Μούσμουλα* (1), *μουρμούρα* (1).

Apost. 24 (*Pagellus breviceps*).

121. *Pagellus mormyrus* (L). H. *Μουρμούρα* (2).

Apost. 24 (*Pagellus mormyrus*), *μουρμούρα*. A. G. *μόρμυρος*. Aristotle 570b 20.

Cf. Athen. vii, 94. Oppian, Hal. 1, 100, Latin *mormyr*. Ovid, Hal. 110. Plin. 32, 152. Ovid speaks of *Pictæ mormyres*, painted mormyrs.

There is frequent mention of the name, but apparently nothing that would help in identifying it.

122. *Pagellus centrodonatus* (De La Roche).

Apost. 24.

123. *Sparus pagrus* (L). H. *Φαγγρί* (2), *λυθρίνι* (1).

Apost. 24 (*Pagrus vulgaris* and *Pagrus orphus*), † *μερτζάκι*, a Turkish word equivalent to the Greek *έρθρηνος*. Apostolides gives *φαγγρί* as common name for *Dentex macrophthalmus*, and *λυθρίνι* for *Pagellus erythrinus*. *Φαγγρί* may be M. G. equivalent for A. G.

ζάγρος. Aristotle 598a 13, 601b 30, 1529a 41, 1531a 37. The ζάγρος alternates between the open sea and near the shore, has a stone in its head, and consequently suffers much in winter, is carnivorous, solitary, has a triangular heart, and is at its prime in spring.

Athen. vii, 133. Speusippus, in the second book of his "Resemblances," says the ζάγρος, ἐρυθρήνιος and ἡπατος are similar.

Latin *Phager*, *phagrus*, *pager*, *pagrus*; hence, Spanish *Pargo*, English *Porgy*, corrupted to *Pogy*. Plin. 32, 150, 9, 57, 32, 113. Ovid. Hal. 107. See Bonitz's Index to Aristotle s. v. ἐρυθρήνιος, fin.

Under one of my specimens I noted that the tips of scales and ends of fins and tail were crimson.

Λοθρήνι is undoubtedly M. G. form of ἐρυθρήνιος. Λοθρήνι or λοθρηνάρι (Apostolides, bottom of p. 23) = ἐλοθρήνιον or ἐλοθρηνάριον, diminutive of ἐλοθρήνιος = ἐρυθρήνιος. The only possible question is on the last equation. The interchange of the liquids *l* and *r* is, however, a quite common phonetic phenomenon, though not, so far as I know, occurring elsewhere in passing from A. G. to M. G. Perhaps λόθροον, gore, is from ἐρυθρός and M. G. λοθράζω = ἐρυθράζω.

The fish ἐρυθρήνιος is frequently mentioned in Aristotle.

Aristotle, 538a 19-21, 567a 27, 598a 13, 741a 36, 750b 30, 755b 20, 760a 8, 1511b 37, 1528b 1, 1529a 39.

According to Aristotle the ἐρυθρήνιος is a pelagic fish, and of both it and the χάννη the male had never been seen. He says the most of the fishes are male and female, but concerning the ἐρυθρήνιος and χάννη there is a doubt, for all which are caught have eggs in them. Again he says of those called ἐρυθρήνιοι no male has ever been seen, but only females, and these full of eggs. But we have not yet trustworthy observation on this point.

The name means red or reddish, and the color of the fish must have justified the name.

124. *Sparus aurata* (L). II. Τσιππούρα (1).

Apost. 24 (*Chrysophrys aurata* and *Chr. crassirostris*), † χρυσοάρα, τσιππούρα, † κόσσα at Corfu, μαρίδα at Missolonghi. Τσιππούρα resembles somewhat the A. G. ἵππουρος, horse-tail, which Aristotle says has the most rapid growth of any fish. See Aristotle 543a 21 23, 599b 3. According to Cont. Lex. τσιπούρα is a

M. G. name for the refuse of grapes when the juice has been pressed out. For *μαρίδα* see *Smaris*.

Χρυσόφα is perhaps the A. G. *χρόσοφρος*. Aristotle 598a 10, 591b 9, 489b 26, 508b 20 21, 543b 3, 570a 20, 598a 21, 537a 28, 599b 33, 602a 11. The *χρόσοφρος* (literally "golden brow") has two fins on its back and two on its belly, has few pyloric appendages, one more and another fewer, is frequently speared in the day-time while sleeping, spawns chiefly where rivers flow, spawns in the summer, is littoral, is found in the lagoons of the sea, hibernates and suffers in winter.

Athen. iv, 13. Matro says: The *χρόσοφρος*, which is the most beautiful among all fishes. Athen. vii, 136. A large and favorite food fish.

125. *Spondyliosoma cantharus* (Gmelin). H. * *Σαθάρι* (1).

Apost. 24 (*Cantharus griseus* and *C. brama*), † *ἀσαθάρος*, † *βαγι-οδύνο* in Corfu. *Σαθάρι* is the common name for *Cantharus* among the men of the fish market. This is a clipped diminutive from *σάθαρος*, *σαθάρι(ον)*. Such diminutives are exceedingly common in the colloquial language of modern Greece, being diminutives in form only, and not in meaning.

In modern Greek *σάθαρος* and *σάνθαρος* means a beetle, just as ancient *άνθαρος* (see Contopoulos Lex. s. v.). So also M. G. *σάθαρος*, no doubt, equals ancient *άνθαρος* as name of a fish. For initial *σ* cf. (Σ) *ζάμανδρος* and (σ) *ζέπαρον* in Hom. where the fact that a short vowel is not read long before these words shows that they originally lacked the initial *σ*. Cf. also *ζάπετος* for *σάπετος*, *ζνίψ* and *σζνίψ*, *ζόνις* and M. G. *σζόνι*, *ζόπτω* and M. G. *σζόπτω*, etc. Forms with and without initial *σ* before *μ* are common, as *μυζρός* and *σμιζρός*, *μύλαξ* and *σμίλαξ*, etc. For omission of the nasal before a mute cf. *γομφάρι* and *γοφάρι*.

Arist. 598a 10, speaks of the *άνθαρος* as a littoral fish of solid flesh. According to Oppian it delights in rough rocks, Op. Hal. iii, 340.

126. *Spondyliosoma orbiculare* (Cuv. & Val.). H. * *Σαθάρι* (2), * *σάθαρος* (1).

Apost. 24 (*Cantharus orbicularis*). *Σαθάρι* = A. G. *άνθαρος*. See under *Spondyliosoma cantharus*.

127. *Scatharus græcus* (Cuv. & Val.). H. *Σαθάρι* (1).

Not noticed by Apostolides.

128. *Box boops* (L.). H. *Γόπα* (1).

Apost. 23 (*Box boops*), † *ῥῶπα* and *γῶπα*. *Βῶξ* or *βῶαξ*, now used as scientific name for this genus occurs in Aristotle 610b 4, 1528a 20. He says that they are found in schools. Those (?) marked on the back (*γοτῶγραπτα*) are called *ῥῶξ*, but those marked obliquely (*σκολιόγραπτα*) are called *κολίας* (*σκολίας*). See Athenaeus vii, 27, where a number of references to the *ῥῶξ* are given from different authors. It was a favorite food fish. Athenaeus derives its name *ῥῶαξ* from the word *ῥοή*, a cry or shout, and defends this form of the name and derivation against Aristophanes of Byzantium, who says: "We wrongly call the fish *ῥῶα* (*ῥῶξ*), and ought to call it *ῥῶοπα* (*ῥῶοψ*), since being a little fish it has large eyes. It should be *ῥῶοψ* = having the eyes of an ox." *ῥῶοψ* is compounded of *ῥῶς*, stem, *ῥο*(F) and *ῶψ*, and appears in Homer in the feminine form *ῥῶοπις* as a common epithet of Hera. The word means ox-eyed, large-eyed. If this is the fish now called *ῥῶπα* the authority of Aristophanes of Byzantium prevailed. At any rate, the *ῥῶξ* was a *small fish with large eyes*, having peculiar markings on its back, running in shoals, and admired by epicures.

129. *Boops salpa* (L.). H. *Σάλλα* (1), *γόπα* (1).

Apost. 23 (*Box salpa*), *σάλλα*. Aristotle *σάλλη*. 1528a 4, 1531a 1 2 3, 534a 9, 621b 7, 598a 20, 570b 17, 543a 8, 543b 8.

The *σάλλη* has an especially acute sense of hearing, is enticed by malodorous bait such as dung, spawns in autumn in some places, but in most places in the beginning of summer, feeds on dung and seaweed, may be caught with pumpkin, spawns in the lagoons of the sea, is not carnivorous; it is much lined and red-lined, i. e. marked by many red (orange?) lines, has jagged teeth, and is solitary; it is best in harvest time. Athen. vii, 118. The *σάλλη* is variegated in color. Whence Mnaseas, who compiled the work entitled "Sports," was called *Σάλλη* by his acquaintances on account of the brilliant variety of the collection. There is a similar fish in the Red Sea called *στροματέβς*, having golden bands extending across all its body as Philo reports in his "Metallicon."

130. *Oblada melanura* (L.). H. *Μελανοῦρι* (1).

Apost. 23 (*Oblada melanura*), *μελανοῦρι*, black-tail. Aristotle 591a 15, 1528a 24, 1511b 37, 1512a 3, *μελάουρος*. It feeds on sea-

weed. The *μελάουρος* and *σαργός* are spotted on their tails (have a spot on their tails), and are much lined and dark-lined. Athen. vii, 93. Hicesius says it is like the *σαργός*.

Epicharmus mentions together *σαργίνοι* and *μελάουροι*. Latin *Melinurus*. Ennius, Ovid, Plin., etc. Op. Hal. 1, 98.

There are many references which mention the *μελάουρος*, but they add nothing to our knowledge of it. The meaning of the name so well describing the fish, and the fact that it is still in common use for this species establish its identity.

131. *Dentex dentex* (L). H. *Συναγρίδα* (2).

Apost. 24 (*Dentex vulgaris*), *συναγρίδα*. Aristotle *συναγρίς* (gen. *συναγρίδος*, acc. *συναγρίδα*). 505a 15, 506b 16. The *συναγρίς* has four single gills on each side, and the gall bladder on the entrails. Athen. vii, 121, *συναγρίδες*. Epicharmus mentions these in "Marriage of Hebe" and "Land and Sea."

132. *Dentex macrophthalmus* (Bloch).

Apost. 24 (*Dentex macrophthalmus*), *φαγγρί*. Cf. *Sparus pagrus*.

133. *Mæna mæna* (L).

Apost. 24 25 (*Mæna vulgaris*, *Osbeckii* and *Jusculum*, the two latter doubtful species).

134. *Spicara smaris* (L). H. *Μαρίδα* (1), * *μαίνουλα* (1), * *ξενουλα* (?) (1) * *μέλωνα* (1).

Apost. 25 (*Smaris vulgaris* and *Chrysalis*), † *σμαρίς*, † *μαρίς*. In M. G. *αι* = *ε*, so that *μαίνουλα* (*μίνουλα*), *ξενουλα* and *μέλωνα* (*μέλουνα*) are evidently all modifications of the same name. *Μαρίδα* is the regular M. G. equivalent for A. G. *μαρίς* or *σμαρίς*. *Μαίνουλα* suggests *μινίς*, found in Aristotle as name of a fish. 610b 4, 607b 10-21, 570b 15-30, 569b 28, 1529a 7, 607b 10. The *μινίς* spawns after the winter solstice and is the most prolific of fishes. It is good when pregnant. The form of the female is rounder, that of the male longer and flatter. When the female is beginning to be pregnant the male is black and variegated in color. At this time they are called *τρίγοι* (he-goats) by some. They run in schools. *Σμαρίς*, Aristotle 607b 22. The *σμαρίς* changes its color in like manner with the *μινίς*, being lighter in winter and darker in summer. This is most evident around the fins and gills.

Op. Hal. 1, 109. Along the sedgy shore beneath the green plants feed *μαινίδες*, *τρίγυι*, *ἀθερῖνοι*, *σμαρίδες* and *βλέννος*, etc.

Epichar., frag. 35; Athen., vii, 92 and 137.

Speusippus says that the *βόαξ* and *σμαρίς* are like the *μαινίς*.

135. *Spicara alcedo* (Risso). H. * *Ζέδροουλλα*.

Apost. 25 (*Smaris alcedo*).

136. *Centracanthus cirrus* (Rafinesque).

Apost. 25 (*Smaris maurii*).

Family **PERCIDÆ**.

137. *Perca fluviatilis* (L).

Apost. 17 (*Perca fluviatilis*), † *πέστροφα*.

Family **MULLIDÆ**.

138. *Mullus surmuletus* (L). II. *Μπαρμπούσι* (Barbouni) (2).

Apost. 15 (*Mullus surmulletus*) † *τρίγλις*, *μπαρμπούσι*, *πετρόφαρο*, † *τσιγαρόλια*.

Apostolides identifies this with the ancient *τρίγλη*. Aristotle 1531a 26, 598a 10-21, 570b 22, 610b 5, 1531a 32, 621b 7, 1531a 32-33, 591a 12, 508b 17, 591b 19, 557a 26, 1531a 34, 621b 21, 1511b 39, 1512a 3, 570b 22-25, 543a 5, 1531a 24 33.

According to Apostolides the names *τρίγλις* and *μπαρμπούσι* are common to all species of the *Mullus*. *Μπαρμπούσι* is an Italian name. The same fish is common in both Italian and Greek markets under this same name. It is perhaps the same as the fish which the Romans called *Barbus*. Ans. Morell., 94, 134, cf. Cic. Par. 5, 2, 38, *Barbatulus mullus*, and id. Att. 2, 1, 7, *Barbati mulli*, bearded mullets.

According to Aristotle the *τρίγλη* (or *τρίγλα*) has many pyloric appendages, is the only fish that breeds three times a year, is especially infested with fish lice, feeds on sea-weed, shell-fish and mud; it lives near the shore, is found in the lagoons, runs in schools and eats flesh, but is not exclusively carnivorous.

Athen. vii, 125. The *τρίγλη* is sharp-toothed, gregarious, all spotted (?), and moreover carnivorous. When it has produced young (spawned) three times it is barren, for it gets little worms in its uterus which devour the eggs (or young *γόνος*). Speusippus says the *κόκκωξ*, *χελιδών* and *τρίγλη* are similar. They are called red-colored and yellow-colored.

Athenaeus gives many other references to the *τριγλή*, but apparently they throw no light upon the identification of the fish.

139. *Mullus barbatus* (L).

Apost. 15 (*Mullus barbatus*), † *κεφαλάδες* at Chaleis.

140. *Mullus fuscatus* (Rafinesque).

Apost. 15.

Family **SCIÆNIDÆ**.

141. *Umbrina cirrosa* (L).

Apost. 18 (*Umbrina cirrosa*), *σιώς*, Cf. *Corvina nigra* = *Sciaena umbra*.

Aristotle has *σιάινα* 601b 30. He says: "Those fish which have a stone in the head, as *χρόμις*, *λάβραξ*, *σιάινα* and *φάγρος* suffer most in the winter. Athen. vii, 121, shows that the *σιάινα* was also called *σιιαθίς* by Epicharmus and *σιιαδέης* by Numenius.

Latin *Sciaena* and *Sciædeus* for the female and male respectively. Plin. 32, 151. *Σιώς* and *σιάινα* both seem to be from *σιώ*, shadow; Latin, *Umbra*.

142. *Sciæna aquila* (Lac.).

Apost. 18 (*Sciæna aquila*), *μολοκόπι*, † *κρανώσις* at Chalcis.

143. *Sciæna umbra* (L). II. *Μολοκόπι* (1), * *σαραβάνο* (1), *σιώς* (1).

Apost. 18, 19 (*Corvina nigra*), † *σιώς καλιαικούδα*. According to Apostolides *μολοκόπι* is common name for *Sciæna aquila*. For *σιώς* see *Umbrina cirrosa*, Apost. 18.

Family **LABRIDÆ**.

144. *Labrus bergylta* (Ascanius).

Apost. 25 (*Labrus bergylta*), *ζελοόδισσες*, *ζεϊλος*, *ζεϊλον*, † *φουκόφαρο* and *πετρόφαρο* M. G. names for the *Labrus*. *Φουκόφαρο*, = *φύκος*-fish, may be referred to A. G. *φύκης* and *φουίς*. The names are manifestly from *φύκος*, sea-weed. Aristotle 567b 20 19, 591b 16, 607b 20, 1528a 10, 607b 18, 591b 13.

The small *φουίδες* spawn twice a year, the male (*φύκης*) differs from the female (*φουίς*) by being darker and having larger scales. They feed upon the sea-weed (*φύκος*), eat no flesh except that of the *καρίδες* (shrimps), change their color, being variegated in the spring but white during the rest of the year, and are the only sea-fishes which make a nest and lay their eggs in the nest. It

is a small fish, one of the rock-fish (πετραῖται; observe M. G. name πετρούψαρο), crowned with spines, belongs to the πετραῖται which are called soft-fleshed, such as the κόσσυφοι, κίχλαι, πέρραι, κόθιοι, etc. For χεῖλοῦ, etc., see *Crenilabrus pavo*.

145. *Labrus livens* (L.) H. *Αόμπρινα* (1).

Apost. 25 (*Labrus merula*).

146. *Labrus viridis* (L.) H. *Πετρόψαρο* (1), * *σουλουμπάρδος* (1).

Apost. 25 (*Labrus viridis*, etc.). According to Apostolides all species of the genus *Labrus* are called by the names χεῖλοῦδισες, χεῖλος, χεῖλοῦ, φουζόψαρο and πετρόψαρο.

147. *Labrus bimaculatus* (L.)

Apost. 25 (*Labrus mixtus*, etc.).

148. *Symphodus ocellaris* (L.) H. * *Καθώρας* (1), * *σφίγγα* (1), sphinx.

Apost. 25 (*Crenilabrus roissali*).

149. *Symphodus ocellatus* (Forsk.)

Apost. 25 (*Crenilabrus ocellatus*).

150. *Symphodus mediterraneus* (L.) H. * *Σελήγη* (1).

Apost. 26 (*Crenilabrus mediterraneus*). I can not find *σελήγη*, moon, given as name of a fish in any book, ancient or modern. The nearest approach is *σουλίγα*, given by Cent. Lex. as common name of the bivalve *Eusis siliqua*, called razor-fish and spout-fish in English according to the Cent. Dictionary. The word *σουλίγα* also means spout-fish, being from ancient *σολήγ*, a spout or gutter.

This name is used by the ancients as name of a bivalve, and this is no doubt the same as is now called *σουλίγα*. See Aristotle 683b 17, 528a 17 22, 548a 5, etc.

151. *Symphodus tinca* (L.) H. * *Χεῖλοῦσα* (2), *χεῖλοῦ* (1).

Apost. 26 (*Crenilabrus pavo*), † *λίπανα*, † *λαπίνα μαύρη* (black) and *μεγάλη* at Chalcis.

Χεῖλος means lip, Latin *labrum*, whence the name *Labrus*. Apostolides gives *χεῖλος* and *χεῖλοῦ* as common name of *Labrus* in all species. *Χεῖλοῦσα* is clearly the same as *χεῖλοῦ*. My three specimens were obtained on different occasions and probably from different parties, making it evident that *χεῖλοῦ* is used for *Symphodus* as well as for *Labrus*.

152. *Symphodus melops* (L.).Apost. 25 (*Crenilabrus melops*).153. *Symphodus cinereus* (Bonnaterre).Apost. 25 (*Crenilabrus massa*).154. *Symphodus melanocercus* (Risso).Apost. 25 (*Crenilabrus caeruleus*).155. *Symphodus scina* (Forsk^okal).Apost. 26 (*Corieus rostratus*).156. *Ctenolabrus suillus* (L.). II. * *Κατράβανος* (1).Apost. 26 (*Ctenolabrus rupestris*).157. *Julis julis* (L.). II. * *Ταυτάνο* (1).

Apost. 26 (*Julis vulgaris* and *J. giofredi*), † *γύλος*. According to Apostolides this is the ancient *Ἰουλος*. Aristotle 610b 6 gives *ἰουλῖς* (Latin *Julis*) as name of a fish found in schools; *Ἰουλος* = down, hair, beard; also a centipede. Cf. Athen. vii, 70 and 20.

158. *Thalassoma pavo* (L.).

Apost. 26 (*Julis pavo*), † *γαῖτανοῦρι*, † *φιάρμουλα* at Patras, and † *γρᾶβανός* at Trikeri. *Γαῖτάνι* is a Turkish word meaning a silken cord, a string (Cont. Lex.). *Γαῖτανοῦρι* would accordingly mean string-tail.

159. *Xyrichthys novacula* (L.).

Apost. 27 (*Xyrichthys novacula*), † *κατεργάρος* and † *κτένι*, according to locality. The former means rogue, one condemned to work in the galleys (*κάτεργα*). *Κτένι* is M. G. for A. G. *κτεῖς* (gen. *κτενός*), a comb. *Κτεῖς* in A. G. was used as name of a bivalve, a cockle or scallop, often mentioned in Aristotle. According to Cont. Lex. the modern *κτένι* is used in same way, the sea comb.

Family POMACENTRIDÆ.

160. *Chromis chromis* (L.). II. * *Σαθάρι* (1).

Apost. 27 (*Chromis castanea*), † *καλόγρηα* and *καλογρίσα*. *Καλόγρηα* means a nun. *Καλογρίσα* would seem to be another form for the same, although the lexicon (Cont. Lex.) gives it as meaning tomtit. *Σαθάρι* is probably a mistake here, the man who sold it me supposing it to be *Cantharus*.

Family TRACHINIDÆ.

161. *Trachinus draco* (L.). II. Δράκαινα (₂).

Apost. 13 (*Trachinus draco*). According to Apostolides δράκαινα is common name for all species of the genus *Trachinus*. In A. G. δράκαινα is feminine of δράκων, a serpent or dragon. The kindred word δρακαινίς, also a feminine of δράκων, occurs as name of a fish in a fragment of the comic poet Ehippus, who flourished in the early part of the Fourth century, B. C. Also in a fragment of Mnesimachus. Aristotle 598a 11 uses δράκων as name of a fish which lives near the shore (i. e. a littoral fish). A fragment of Epicharmus also contains δράκων as name of a fish. Vide Athen. vii, 28.

162. *Trachinus vipera* (Cuv. & Val).

Apost. 13.

163. *Trachinus araneus* (Cuv. & Val).

Apost. 13.

164. *Trachinus radiatus* (Cuv. & Val).

Apost. 13.

Family URANOSCOPIDÆ.

165. *Uranoscopus scaber* (L.). II. Αίχμος (₁).

Apost. 13 (*Uranoscopus scaber*), λίγνος, λοῦτσος and † κοῦκος. Identified in Apostolides with the καλλιόνομος of Aristotle. For καλλιόνομος see Aristotle 598a 11, 506b 10, 1529b 9.

According to Aristotle the καλλιόνομος it a littoral fish with the gall on the liver, and has the largest gall-bladder of any fish in proportion to the size of the fish.

Aelian, N. A. 134, says: "Concerning it (the fish called καλλιόνομος) Aristotle says that it has a large gall-bladder attached to the right lobe of the liver, and that it carries its liver in its left side."

According to Athenaeus, vii, 16 and 17, there seems to have been considerable confusion among the names ἀνθίας, καλλιχίθος, καλλιόνομος and ἔλοψι." Pliny says (32, 146): Callionymus or Uranoscopus. (32, 69). The same fish (Callionymus) is also called *Uranoscopus* (sky-gazer), from the eye which it has in its head. Athen. viii, 52. Θήρανοσκόπος and the one called αἶγμος, or also καλλιόνομος, are heavy as food. Cf. A. G. κάκκοξ, sub. χελιδονόψαρο (*Dactylopterus volitans*).

Family CĒPHALACANTHIDÆ.

166. *Cephalacanthus volitans* (L). II. *Ἀελιδονόψαρο* (1), swallow-fish.

Apostolides 15 (*Dactylopterus volitans*), *χελιδονόψαρο*. Apostolides identifies this with the *ζόζζυξ* of Aristotle. But may it not be the sea *χελιδών* spoken of by Aristotle 535b 27? He says: "The *πτέλλες* when they rush along, resting upon the water (which people call flying), make a whizzing sound, and the sea swallows (*αἱ θαλάτται χελιδόνες*) do the same, for these fly in the air not touching the water."

Cuvier identifies this sea swallow with *Dact. volitans*. Compare, however, *Trigla hirundo*, still called *χελιδόνα*, the swallow.

Of the *ζόζζυξ*, cuckoo, Aristotle (598a 15 and 535b 20) says: "It makes a sound like the cuckoo, whence it gets its name." The *ζόζζυγες* are both pelagic and littoral (alternately). Vide Plin. *Hirundo*, 9, 82 and 32, 149. Athen. vii, 84.

There is nothing in any reference that I can find to show that the *ζόζζυξ* was a flying fish. According to Apostolides 13 *Uranoscopus scaber* is called *ζόζζος*, M. G. for cuckoo. May not this be *ζόζζυξ*?

Family TRIGLIDÆ.

167. *Peristedion cataphractum* (L). II. **Ἡερατόψαρο* (1), horn-fish.

Apost. 16 (*Peristethion cataphractum*), *καπώνη*.

Two specimens sold me under the name *καπώνη* in the market at Athens turned out to be *Trigla lineata* and *Trigla lyra*.

168. *Trigla lineata* (Gmelin). II. *Ἡαπώνη* (1).

Apost. 16 (*Trigla lineata*).

169. *Trigla cuculus* (L).

Apost. 16 (*Trigla pini*).

170. *Trigla milvus* (Lacépède).

Apost. 16 (*Trigla cuculus*).

171. *Trigla gurnardus* (L).

Apost. 16.

172. *Trigla lyra* (L). II. *Ἡαπώνη* (1).

Apost. 16 (*Trigla lyra*).

173. *Trigla hirundo* (Bloch). II. *Ἀελιδόνα* (1).

Apost. 16 (*Trigla corax*).

Ἀελιδόνα is M. G. for A. G. *χελιδών*, swallow. Aristotle 535b 27. The sea swallows (*αἱ θαλάτται χελιδόνες*) fly in the air, not

touching the sea, for they have their fins broad and long. See *Cephalacanthus volitans*, called *χελιθονόψαρο*. Cf. also *Myliobatis bovina*, Apostolides 9.

174. *Lepidotrigla cavillone* (Lacépède).

Apost. 16 (*Trigla cavillone*).

Family **SCORPÆNIDÆ**.

175. *Scorpæna scrofa* (L.) H. *Σχορπίως* (2).

Apost. 16 (*Scorpæna scrofa*), † *σχορπίω*. According to Apostolides *σχορπίως* is common name of *S. porcus*. *Σχορπίως* = scorpion. As name of a fish Aristotle, 1531a 20, 508b 17, 593a 7, 598a 14. It has many pyloric appendages, breeds (spawns) twice a year, alternates between the open sea and the shallow water along the shore; the *σχορπίδες* breed in the open sea (τὸ πέλαγος).

Athen. vii, 115. Num. "Red *σχορπίως*." Hicesius says: "Of the *σχορπίοι* one kind is pelagic the other littoral; the former is a fiery red, the latter blackish. Epicharmus calls the *σχορπίως ποιχίλος*, variegated. It is solitary and eats seaweed. Aristotle mentions *σχορπίοι* and *σχορπίδες* in different places. It is not clear whether he means the same fish by these two names. That we have frequently eaten both *σκόρπανα* and *σχορπίοι* and that the flavors and colors are different, no one is ignorant. Archestratus, in his "Golden Words," says: "Buy the small *σχορπίως*, but beware of a big one." Athen. viii, 52. The tawny, pelagic *σχορπίοι* are more nutritious than the large ones of the shoal water near shore.

176. *Scorpæna porcus* (L).

Apost. 16 (*Scorpæna porcus*), *σχορπίως* and † *χίγες*.

Family **CALLIONYMIDÆ**.

177. *Callionymus festivus* (L.) H.

Not noticed by Apostolides.

Family **GObIIDÆ**.

178. *Gobius niger* (L).

Apost. 15.

179. *Gobius jozo* (L.) H. *Κωθίως* (3).

Apost. 14 (*Gobius jozo*), *κωθίως*, † *γωθίως*. According to Apostolides *κωθίως* and *γωθίως* are common names for all species of the

genus *Gobius*. Aristotle *ζωθιός*, 610b 4, 598a 11 16, 508b 16, 569b 23, 621b 13 19, 567b 11, 591b 13, 601b 22, 835b 14. The *ζωθιός* has many pyloric appendages above the stomach, spawns near the land on the rocks, the bunches of eggs are flat and crumbling; it feeds on mud, sea-weed, sea-moss, etc.; lives near the land, gets fat in the rivers, and is found in schools. The white *ζωθιός*, found in the Euripus of Lesbos, never leaves that lagoon for the open sea as the other fishes found there do. Latin *Gobio* and *Cobio*, Plin. *Gobius*, Ovid., Hal. 12, 8. Martial 13, 88.

180. *Gobius guttatus* (Cuv. & Val).

Apost. 14.

181. *Gobius auratus* (Risso).

Apost. 14.

182. *Gobius paganellus* (L).

Apost. 14.

183. *Gobius cruentatus* (Gmelin).

Apost. 14.

184. *Gobius capito* (Cuv. & Val).

Apost. 14.

185. *Gobius minutus* (L).

Apost. 14 (*Gobius quadrimaculatus*).

Family **BLENNIIDÆ**.

186. *Blennius pavo* (Risso). H. * *Παπαγάλος* (ι), an Italian word meaning parrot.

Apost. 13 (*Blennius pavo*), † *σαλιάρης*.

187. *Blennius sanguinolentus* (Pallas).

Apost. 13.

188. *Blennius gattorugine* (Bloch).

Apost. 13 (*Blennius gattorugine*), † *σαλιάρη*, slobbering.

189. *Blennius ocellaris* (L).

Apost. 14.

190. *Blennius pholis* (L).

Apost. 14.

191. *Blennius trigloides* (Cuv. & Val).
Apost. 14.
192. *Blennius galerita* (L).
Apost. 14 (*Blennius montagnei*).
193. *Cristiceps argentatus* (Risso). H. Γῶπα (₁).
Apost. 14 (*Clinus argentatus*). For γῶπα see *Box*.
194. *Tripterygion tripteronotus* (Risso).
Apost. 14 (*Tripterygion nasus*).

Family OPHIDIIDÆ.

195. *Ophidion vasalli* (Risso). H. *Γιλάρι: or *χιλάρι: (₁).
Apost. 28 (*Ophidium vassali*). Χιλάρι: may be a diminutive from χεῖλος, lip.
196. *Ophidion barbatum* (L).
Apost. 28.

Family GADIDÆ.

197. *Gadus callarias* (L).
Apost. 28 (*Gadus morrhua*, the young of *G. callarias*). † Μουρόνια at Chalcis. Rare, according to Apostolides, but the identification must be doubtful.
198. *Phycis phycis* (L). H. *Πουτίλι: (₁).
Not seen by Apostolides. Πουτίλι, M. G. for mouse. Cf. Aristotle, ὁ πουτίλιος μῦς, 600b 13, 632b 9.
199. *Pollachius poutassou* (Risso). H. *Τσιπλιάζι: (₁).
Apost. 29 (*Merlangus poutassou*), †γαῖδοσυρόψαρον.
The name γαῖδοσυρόψαρον is modern, meaning donkey-fish. Γαῖδοσυρος = γάδαρος = ass, donkey. The ancients called a certain fish ὄνος. Dorio, in Athenaeus vii, 99, says some persons call the ὄνος (i. e. the fish ὄνος) γάδος. Epicharmus in his Marriage of Hebe says: "Wide-gaping γάσσαι and monstrous-bellied ὄνοι." See Aristotle 599b 33, 601a 1, 620b 29, frag. 307, 1530a. According to Aristotle the ὄνος has a mouth opening wide (lit. breaking back), like the γαῖσοί. It leads a solitary life, is the only fish which has its heart in its belly, has stones in its brain like mill-stones in form, and is the only fish which lies torpid in the warmest days under the

reign of the dog-star, Sirius, the other fishes going into this torpid state in the wintriest days. The ὄνος, βιάτος, ψήπτα and βίνη bury themselves in the sand and after they make themselves invisible they wave the things in their mouths which fishermen call little rods or little wands (ρόσδία).

200. *Merluccius merluccius* (L). H. Μπαζαλιόρο (1).

Apost. 29 (*Merluccius vulgaris*), μπαζαλιόρος. Cont. Lex. μπακαλιός. Turkish word meaning stock-fish. Μπαζάλις (Turk) = grocer. Also written βιαζαλιός and βιαζάλις.

201. *Mora moro* (Risso).

Apost. 29 (*Mora mediterranea*).

202. *Molva elongata* (Otto).

Apost. 29 (*Lota elongata*).

Family PLEURONECTIDÆ.

203. *Pleuronectes flesus* (L).

Apost. 29 (*Flesus passer*).

204. *Psetta maxima* (L).

Apost. 30 (*Rhombus maximus*), † καλζάνι.

205. *Bothus rhombus* (L).

Apost. 30 (*Rhombus lævis*).

206. *Platophrys podas* (De la Roche). H.

Apost. 30 (*Pleuronectes candidissimus* and *Bothus rhomboides*).

207. *Eucitharus linguatula* (L). H. Γλωσσα (2).

Not noticed by Apostolides. For γλωσσα see under *Solea solea*.

208. *Solea theophila* (Risso).

Apost. 29 (*Solea lascaris*).

209. *Monochirus variegatus* (Donovan).

Apost. 30 (*Microchirus variegatus*).

210. *Monochirus hispidus* (Rafinesque). H. * Καζώρα.

Not recorded by Apostolides.

211. *Monochirus ocellatus* L.

Apost. 29 (*Solea oculata*).

212. *Solea solea* (L). II. Γλωσσα (1).

Apost. 29 (*Solea vulgaris*), γλωσσα, tongue. † Λωματίδα at Nauplia and Missolonghi. I found γλωσσα a common name for any kind of sole. Ancient writers used βούγλωσσος, ox-tongue, as name of a kind of fish. The name is quoted by Athenaeus from various writers. Athen. iv, 13, Matro. "A βούγλωσσος which dwelt in the foaming brine (sea)" VII, 30. "The roughish βούγλωσσος." The κινόγλωσσος (dog-tongue) differs from the βούγλωσσος. The Attics call it φήττα. VII, 139. Speusippus says that the φήττα, βούγλωσσος and ταυρία are similar. Βούγλωσσος, φήττα and μῶς are given at the end of a list of fishes, the list being quoted from Aristotle. Dorio names βούγλωσσος and φήττα as belonging to the flat fishes. The Romans call the φήττα βόμβος, which is also a Greek name. Oppian Hal., i, 99.

It is plain from the above that the βούγλωσσος and φήττα were much alike, if not the same.

Family BALISTIDÆ.

213. *Balistes carolinensis* (Gmelin).

Apost. 12 (*Balistes capriscus*), † μονόχοιρος, lone-pig.

Family MOLIDÆ.

214. *Mola mola* (L).

Apost. 11 (*Orthogoriscus mola*).

215. *Ostracion trigonus* (L).

Apost. 12.

A West Indian species, said by Apostolides to have been taken at Skiathos, which is probably an error.

Family LOPHIIDÆ.

216. *Lophius piscatorius* (L). H. * Πεσκανδρίτζα or * πεσκαντρίτζα (2).

Apost. 14 (*Lophius piscatorius*). Probably of Italian origin, meaning fisher. † Μλάσσα at Chalcis, † σκλεμποῦ and † βάρραχόψαρο at Patras. The βάρραχος ὁ ἀλιεύς (the fisher frog) of Aristotle. See Aristotle 505a 6 b 4, 506b 16, 564b 18, 565b 29, 570b 30, 620b 11 ff, 695b 14, 696a 27, 749a 23, 754a 23 ff, 755a 9, 835b 13, 1527b 41-43, 540b 18.

Aristotle says with regard to the βάρραχος: "Inasmuch as the flat front part is not fleshy, nature has compensated for this by

adding to the rear and the tail as much fleshy substance as has been subtracted in front." The βιάτραχος is called the angler. He fishes with the hair-like filaments hung before his eyes. On the end of each filament is a little knob just as if it had been placed there for a bait. He makes a disturbance in sandy or muddy places, hides himself and raises these filaments. When the little fishes strike at them he leads them down with the filaments until he brings them to his mouth. The βιάτραχος is one of the σελάχη. All the σελάχη are viviparous or ovoviviparous except the βιάτραχος. The other flat σελάχη have their gills uncovered and underneath them, but the βιάτραχος has its gills on the side and covered with skinny opercula, not with horny opercula like the fish which are not σελαχώδη. Some fishes have the gall bladder upon the liver, others have it upon the intestine, more or less remote from the liver and attached to it by a duct. Such are βιάτραχος, ἔλλοψ, συνογρίς, σμόρανα and ξιφίαις. (Proved true of *Lophius piscatorius* by a dissection by Dr. C. H. Gilbert.) The βιάτραχος is the only one of the σελάχη which is oviparous. This is on account of the nature of its body. For it has a head many times as large as the rest of its body, and spiny and very rough. For this same reason it does not afterwards admit its young into itself. The size and roughness of the head prevents them both from coming out (i. e. being born alive) and from going in (being taken into the mouth of the parent). The βιάτραχος is most prolific of the σελάχη, but they are scarce because the eggs are easily destroyed, for it lays them in a bunch near the shore.

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JULY 5.

The President, GENERAL ISAAC J. WISTAR, in the chair.

Fifty-four persons present.

JULY 12.

Mr. CHARLES MORRIS in the chair.

Fifteen persons present.

JULY 19.

Mr. CHARLES MORRIS in the chair.

Eleven persons present.

JULY 26.

Mr. BENJAMIN SMITH LYMAN in the chair.

Six persons present.

AUGUST 2.

Mr. CHARLES MORRIS in the chair.

Ten persons present.

AUGUST 9.

Mr. CHARLES MORRIS in the chair.

Nine persons present.

AUGUST 16.

Mr. CHARLES ROBERTS in the chair.

Seventeen persons present.