THUNDER — THUNNUS.

Rayne, hayle, and snowe do pay them said penance,
And dreadfull *thunder-claps* (that make them quake)
With flames and flashing lights that thousand changes make.
Spenser. Faerie Queene, can. 7.

No worke it seem'd of earthly craftsmans wit,
But rather wrought by his owne industry,
That *thunder-darts* for Jove his syre doth fit.
Id. Visions of Bellay.

Nor is he mov'd with all the *thunder-cracks*
Of tyrants' threats, or with the surly brow
Of pow'r, that proudly sits on others' crimes.
Daniel. To the Countess of Cumberland.

Her, and her *thunder-fearless* verdant hayes.
Beaumont and Fletcher. Shroud Representations.

A master of philosophy travelling with others on the way, when a fearful *thunder-storm* arose, checked the fear of his fellows, and discoursed to them of the natural reasons of that uproar in the clouds. *Hall. The Invisible World*, book i. sec. 6.

Hoarse murmurs of the main from far were heard,
And night came on, not by degrees prepar'd,
But all at once; at once the winds arise,
The *thunders* roll, the lucky lightning flies.
Dryden. Cymon and Iphigenia.

His vows, in haughty terms, he thus prefer'd,
And held his sire's horns; the mighty *thunderer* heard.
Id. Virgil. Æneis, book ix.

Whirlwinds and *thunderous* storms his chariot drew
Twixt worlds and worlds, triumphant as it flew.
Browne. Paraphrase of Job.

Tupia was therefore ordered to acquaint them that we had weapons which, like *thunder*, would destroy them in a moment.
Cook. Voyages, vol. i. book ii. p. 279.

To shake thy senate, and from heights sublime
Of patriot eloquence to flash down fire
Upon thy foes, was never meant my task;
But I can feel thy fortunes, and partake
Thy joys and sorrows, with as true a heart
As any *thunderer* there.
Cowper. The Task, book ii.

THUNNUS, from the Greek θυννος, Cuv.; *Tunny*, Pen. In *Zoology*, a genus of animals belonging to the family *Scomberoides*, order *Acanthopterygii*, class *Pisces*.

Generic character. Teeth small and sharp pointed, a single row in each jaw; body thick, rounded, and spindle-shaped, covered generally with very small scales, but about the chest are some much larger and rougher, forming a kind of corslet, which divides posteriorly into numerous points; on each side of the tail a horizontal, longitudinal, sharp, cartilaginous keel in addition to the two little crests seen in the mackarels; first dorsal fin continued almost to the commencement of the second; false fins or finlets between the latter and the caudal fin; no free spine in front of the anal fin; branchiostegous rays seven.

This genus, separated by Cuvier from the Linnæan *Scomber*, is specially distinguished from them by the remarkable corslet around their chest, composed of large rough scales, and which has greater or less extent in the different species. They are found in both the Atlantic and Pacific oceans, and also in the Mediterranean and Indian seas, but it is disputed whether they are migratory, or, living in the depths of seas, merely approach the shores at breeding time. Their flesh is much esteemed, and along the southern coasts of Europe and the islands of the Mediterranean afford extensive employment for fishers. Some of them were well known to the ancients and as highly valued as at present.

Cuvier has applied the word *Thynnus* generically to these fish, but as it had been long before used by Fabricius as the title of a genus of hymenopterous insects, it will be better to use the corresponding word Thunnus to prevent confusion. THUNNUS.

T. Vulgaris, Cuv.; *Scomber Thynnus*, Lin.; *le Scombre Thon*, Lacep.; *Common Tunny*, Pen. Seldom exceeds four feet in length, but occasionally attains to seven and even more; its general form resembles that of the common mackarel, except that it has a shorter muzzle and is larger and rounder about the chest; the lower jaw is rather longer than the upper, and the mouth does not extend so far back as below the eyes; the sharp edge of each jaw is armed with a row of small teeth, sharp as needle points, slightly curved inwards and backwards, about forty on either side, and those in the lower jaw rather largest; other teeth are also upon the front of the outer edges of the palatines and on the middle of the corner; the fatty eyelid covers a large part of the eye; cheeks covered with long, narrow, pointed scales, which give the appearance of wrinkles rather than scales; the rest of the head and the opercular pieces are smooth; the opercule is not notched, but is separated from the subopercule by an indistinct line; the pectoral fins are falciform; the first dorsal fin commences nearly opposite its base and has fourteen strong spines, all of which can sink into a groove on the back, the first of which is the longest and about a fifth of the depth of the body; the second dorsal has first a little concealed spine, which is followed by ten soft rays, of which the front one is as high as the first dorsal spine and the others rapidly shorten: behind it nine false fins; ventrals scarcely half so large as the pectorals: anal opposite the second dorsal, and pointed like it; at its front are two concealed spines, and behind it nine false fins; caudal fin crescent-shaped, with two very large points widely distant from each other; on each side of the tail, from opposite the seventh false fin, is a longitudinal membranous keel of a curved form, and between the roots of the caudal rays the two little crests seen in mackarel. The whole upper part of the Tunny is bluish-black, and the most scaly part of the corslet inclined to whitish, as are also the sides of the head; belly greyish, sprinkled with numerous spots of silvery whiteness, and these below the pectoral fins are disposed in vertical ribands; farther back they are oval or nearly round, and towards the tail form longitudinal ribands; the first dorsal, the pectoral, and ventral fins are blackish, the caudal paler; the second dorsal and the anal inclining to flesh-colour tinged with silver, and the false fins sulphurous yellow edged with black. The Tunny is found in the seas of Europe, but it is most frequent at both extremities of the Mediterranean, where that sea narrows. It is especially numerous in the Gulf at Constantinople, which has thence been called the Golden Horn, for in coming up to enter the Bosphorus, where its food is very abundant on account of the numerous rivers which empty themselves there, the shoal meets with some white rocks near Chalcedon which frighten and induce them to run over to the Byzantine Gulf, so that the Byzantines enjoyed great advantages from the fishery, of which the Chalcedonians had neglected to take advantage in the choice of site for their city, which on this account was called by the ancients the City of the Blind. Their number at Constantinople is at present as great as ever; "they abound here," says Gyllius in his *De Constantinopoleos Topographia*, "more than at Marseilles, Venice, or Tuento. A single cast of a net will fill twenty smacks; they may be taken without nets, merely with the hand;

THUNNUS.

and when in close ranks they approach the port are killed with stones. The women catch them merely by dropping from their windows into the sea a basket attached to a cord." Von Hammer confirms the preceding account, and states that, for this reason, upon the Byzantine medals are seen the effigies of a Tunny and two other fish. And as it was caught without as well as within the Straits of Gibraltar, it was also seen upon the Phœnician medals of Cadiz and Carteja. They occasionally visit our own coasts. Couch mentions them as having been taken off the Cornish coast: small ones are not unfrequently caught at Yarmouth during the mackerel season, and in 1807 three were sold at Billingsgate which were taken at the mouth of the Thames; and Pennant says they are not uncommon in the lochs on the western coast of Scotland, where they come in pursuit of herrings, and often during night strike into the nets and do considerable damage. It feeds on pilchards and herrings, according to Couch, and also specially on the skipper, *Exox Saurus*, to which it seems very partial, for it not only compels that fish to jump out of the water, but even springs after it to a considerable height, usually across its course, and endeavours to strike it down with its tail. The Tunny fisheries are now confined almost entirely to the interior of the Mediterranean; at Constantinople, and in the Black Sea, it has been almost entirely given up. Formerly the fisheries at Conil, on the Spanish coast near Cadiz, and at the Castle of Sara near Cape Spartel, were much celebrated, and furnished large revenues to the Dukes of Medina Sidonia, but since the earthquake of Lisbon the fish are said to prefer the African coast. At present, Catalonia, Provence, Liguria and Sicily are the countries where the fisheries are carried on with greatest activity. Two methods are employed in the capture of the Tunny. In the first, a person placed on some elevated station gives notice of the approach of the fish. Such also was the practice amongst the ancients, as stated by Oppian in his *Halieutics*; the stations were called θυννοσκοπεῖα, and the watchers θυννοσκόποι; and many of the old stations on the Sicilian coast are still used for the same purpose. As the fish approach, the large fleet of boats spread out into a wide curve, the extremities of which they gradually bring together, and enclosing the fish frighten them so that they herd more and more closely together. Additional nets are thrown within the former to collect them still more completely towards the shore, after which, when but a few fathoms distant, another net with a conical bottom is thrown in, and being drawn along the ground brings the fish out, often to the amount of two or three thousand quintals (about 150 or 220 cwt.) at a single draught. The other mode is with an apparatus which the French call *Madrague* and the Italians *Tonnara*, a sort of aquatic house, as Brydone calls it, built at great expense. Very large and long nets, supported above by corks and extended by leads and stones below, are fixed with anchors so as to form an enclosure parallel to the coast for many hundred toises, or even to the length of an Italian mile. Numerous chambers are formed in the enclosure by nets placed transversely, and opening on the shore side with a kind of door. The Tunnies, always swimming close to the shore, meet with a net placed transversely, which inclines them towards the entrance of the enclosure, having once passed through which they are driven by various methods from chamber to chamber till they reach the last *corpou*, or chamber of death, at the bottom of which is spread a horizontal net, and this being raised by the fishermen brings the Tunnies to the surface, where they strike them with poles and all kinds of weapons. As the salmon fishery with us, so that of the Tunny is protected and determined by law in Sicily, although the subject has afforded as much opportunity for dispute as with us. Those who maintain that the number and distance of the madrigues should be fixed, assert that the Tunny only visits the Mediterranean periodically; that it enters by the Straits of Gibraltar, follows a peculiar course, and returns to the Atlantic in a contrary direction, and therefore that madrigues placed too closely in front of each other interfere with the passage of the fish. On the contrary, others say that the Tunny lives constantly as well as breeds in the Mediterranean; that in winter it seeks the depths of the sea, but in spring approaches the coast to spawn, remains part of the summer at the surface, and in winter returns to the deep sea, and therefore that any interference with the proximity of the nets serves only as a restriction to industry, without being of any benefit to the fisheries. Cuvier states that a Sicilian nobleman, Don Carlo d'Amico, Duke of Ossada, has made some very curious and accurate observations on this subject. The Tunnies caught at the commencement of the fisheries in April and early in May have not then spawned; in a few days the ovaries swell, and from fifteen ounces acquire a weight of twelve pounds and a half. About the 15th of June, excited by the desire of reproduction, they are observed in constant motion, leaping about in the gulfs and bays, and dropping their eggs among the spawn where they are fecundated by the male fish. The young fry in the month of July do not exceed an ounce and a half in weight, and are then called *Nuzzinfuli*; in August they have increased to four, and in October will weigh thirty ounces. It is also certain that on almost all the Mediterranean coasts the Tunnies appear nearly at the same time, and without seeming to pass over certain districts to arrive at others. On many parts of the Spanish coast they arrive in three shoals, the first consisting of the large fish, which weigh four or five quintals, the second of those of two or three, and the last of those which do not weigh more than forty to a hundred and fifty pounds. The fisheries commence for the spring in May, when the Tunnies are taken as they approach the coast, and again in August for the autumn, when they begin to leave it. The shoals are commonly preceded by the sardines, which being pursued by the dolphins often take refuge among the Tunnies, and hence the fishermen say there is a kind of friendship between themselves and the dolphins, which going before them lure the Tunnies into the nets, and therefore when they see one are accustomed to call out "for a dolphin," to induce it to get out. The flesh of the Tunny resembles beef, but is paler, but some parts of it resemble veal, and others pork; the belly part is considered the best and called *ventre*, and is worth twice as much as the inferior *nella*. Large quantities of Tunny are pickled: the fish first gutted, then washed with brine, cut into pieces and covered with bruised salt, is put into barrels with salt between each layer. The roe is made into a sort of boutargue, or sausage.

T. Brachypterus, Cuv.; *Short-finned Tunny*. About three feet in length, is very similar in its general form to the last species, but has the pectoral fins much shorter; the second dorsal and anal fins much lower, and the corslet less extensive; upon the dark blue

back are some much paler spots, and upon each side twelve or thirteen vertical blackish bands, upon each of which is a series of roundish spots; in the young fish both lines and spots are most apparent; all the fins, both true and false, are grey with a reddish tinge. Is taken off the coast of Provence, and there called *Alacorti*.

T. Coretta, Cuv.; *American Tunny*. Seems intermediate to the preceding; its corslet resembles that of the last species; its pectoral fins are falciform, but the second dorsal and anal low; it has eight *false* fins above and seven below. Is taken off the Antilles, and called by the French colonists the *Bonite*.

T. Thunnina, Cuv.; *Tonnine*. Nearly three feet in length: in general form it resembles the Common Tunny, but has the muzzle shorter, the preopercule less vertical, and its length greater; its pectoral fins proportionally shorter: the front of the first dorsal more elevated, but that of the second less so, and its corslet much less extensive; the smooth parts scarcely exhibit any appearance of scales; the back is bright blue with broad black lines, wavy, and twisted in different directions, with the interspaces here and there marked with one or two round spots; towards the tail the lines become more parallel, and rise obliquely backwards, but are always wavy, and sometimes branching; sides of the head and body and the belly silvery, irregularly spotted with black. Is found in the Mediterranean. Cuvier thinks Rafinesque's *Scomber Alliteratus* identical with this species, which has also been described by Risso, under the name *T. Leachianus*.

T. Brasiliensis, Cuv.; *Brasilian Tunny*. Is so similar to the last species as to be scarcely distinguishable from it; the preopercule is a little shorter and more regularly rounded; the last rays of the dorsal fin are lower and more slender; the colours are nearly the same, except some variation in the black markings of the back. From the Brazilian coast.

T. Brachypterus, Cuv.; *Short-finned Tonnine*. Has the same relations to *T. Tonnina* as the Short-finned Tunny has to the common species; having the pectorals much shorter, and the second dorsal and the anal fins much smaller. Is found in the Mediterranean.

T. Pelamys, Cuv.; *Scomber Pelamys*, Lin.; *Bonito*, Couch; *Striped-bellied Tunny*, Yarr. From two feet to two feet six inches in length; has the head conical, and the lower jaw projecting; teeth few and small; body round to the vent, and thence tapering to the tail, near which it is depressed; corslet much extended; eyes elevated and irides silvery; general colour fine steel blue, deepest on the back, sides dusky, and belly whitish, and marked with eight longitudinal brown bands, passing from the shoot to the caudal fin; first dorsal fin four inches in height, seven in length, and lodged in a groove; second dorsal and anal falcate; ventrals lodged in a hollow. This fish is occasionally met with on the Cornish coast, and is also found in the Brazilian and Indian seas. It feeds on fish, small cuttle-fish, testaceous animals, and marine vegetables. Is well known to voyagers in the tropics by its name *Bonito*, affording much entertainment by its active pursuit of the flying fish, and is often caught by sailors, who shape a piece of lead, and attach to it a pair of feathery wings, to give it the appearance of a flying fish.

T. Alalonga, Cuv.; *Scomber Alalonga*, Gmel.; *Alalonga Tunny*. About three feet in length: is very similar in its general form to the common species, but distinguished by the great length of the pectoral fins, which equal a third of the whole length of the body, and reach as far back as the vent; the general colour is blackish-blue, becoming lighter towards the belly, and subsiding into white; in some specimens, below the lateral line, are some silvery stripes descending obliquely forwards, and nearly parallel to the line of the lower part of the tail. This species is believed to come from the Atlantic into the Gulf of Gascony, where it arrives in large shoals in the middle of June, and sometimes in May, that is, about two months after the arrival of the Common Tunny, and it continues till October. It hunts all fish which live together in shoals. The lines for this fishery require to be not less than four score fathom, as the fish generally keep in deep water, and in certain shoals which must be known, to render success probable. They are caught best with a bait of salt eel, but as they are very voracious, they may be taken with mock baits, as a piece of broken white basin, or a blue rag shaped like a sardine. When the flying fish rise much out of water, and the surface is overshadowed with sea birds, the fishery is generally favourable, and the fisher has scarce time to draw up his line and throw it in again. And when a shoal of these fish is fallen in with, it is followed till the equinoctial gales induce it to return to the Atlantic. It is in high season in July and August, when its flesh is white and delicate, but at other times it is inferior. Cuvier says he believes the name *Germon*, by which this fish is known on the coast of Guyenne and Poitou, is a corruption of the English words *Yarman*, on account of the large size of its pectoral fins giving the appearance of offensive weapons. Some of the French fishers also call it *Longear*. By the Basques it is called *Hegatalonchia*, or Long Fin, and in the Mediterranean it is commonly known as the *Alalonga*.

T. Pacificus, Cuv.; *le Scombre Germon*, Lacep.; *Pacific Germon*. Rather more than three feet in length; resembles the last species, but has the muzzle, and the lower jaw especially, much shorter in proportion. It is caught in the South Pacific Ocean.

T. Argentivittatus, Cuv.; *Silver Banded Germon*. Twenty inches long; has the pectoral fins rather longer than *T. Alalonga*, and proportionally wider; the back is steel blue; the sides and belly deep leaden, marked with vertical silvery lines, and rows of silvery spots in the interspaces; towards the hind parts the lines are broken into spots; the dorsal, anal, and ventral fins are yellowish; the pectoral silvery, and the tail blackish, with a rosy patch in its centre. This fish is found in the Atlantic and in the Indian seas.

T. Bullatus, Cuv.; *Golden Striped Germon*. Twenty-eight inches long; the termination of the corslet is indistinct, and the scales are larger than in the other species; the ascending edge of the preopercule is nearly right lined, and that of the opercule less rounded than in the Common and in the Short Finned Tunny; the back is bright deep blue black, and the belly silvery, tinged with azure; the two colours are separated by a golden-coppery band passing from the upper jaw to the tail. This fish is taken off Trinity Isle.

See Linnæi *Systema Naturæ* à Gmelin; Cuvier and Valenciennes, *Histoire des Poissons*; Pennant's *British Zoology*; Yarrell's *British Fishes*.

THURARIA, in *Botany*, a genus so called by Molina, from *thus*, frankincense, because of the shrub yielding a gum similar to gum *thus*. It belongs to the class *Decandria*, order *Digynia*, and the natural family of *Ebenaceæ*. Generic character: calyx tubular, five-