

EXPLANATION OF PLATE V.

MELANIA SCULPTILIS.

Fig. 1.—Copy of Meek's original figure.

MELANIA SUBSCULPTILIS.

Fig. 2.—Copy of Meek's original figure.

MELANIA TAYLORI.

Fig. 3.—Copy of Gabb's original figure.

LITHASIA ANTIQUA.

Fig. 4.—Copy of Gabb's original figure.

CARINIFEX (VORTICIFEX) TRYONI.

Figs. 5, 6, and 7.—Different views of the type specimen. After Meek.

CARINIFEX (VORTICIFEX) BINNEYI.

Figs. 8 and 9.—Different views of the type specimen. After Meek.

ANCYLUS UNDULATUS.

Fig. 10.—Dorsal view of type specimen. After Meek.

Fig. 11.—Lateral outline of the same.

SPHERIUM? IDAHOENSE.

Figs. 12 and 13.—Copies of Meek's original figures.

SPHERIUM RUGOSUM.

Figs. 14, 15, and 16.—Copies of Meek's original figures.

LATIA DALLII (sp. nov.).

Fig. 17.—Dorsal view of the largest known example.

Fig. 18.—Lateral view of the same.

Fig. 19.—Dorsal view of another example.

Fig. 20.—Dorsal view of another example which has been cut away so as to reveal the transverse semilunar septum.

* All the figures on this plate are of natural size except Figs. 14, 15, and 16, which are a little enlarged.

DESCRIPTION OF FOUR NEW SPECIES OF SHARKS, FROM MAZATLAN, MEXICO.

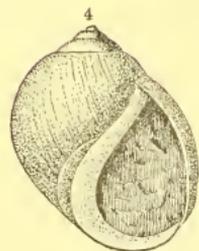
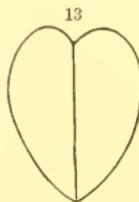
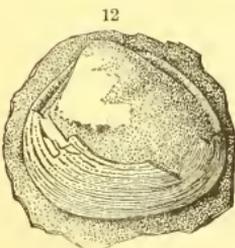
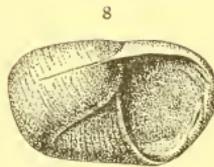
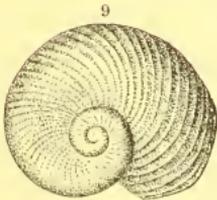
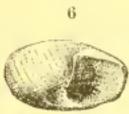
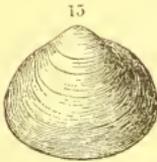
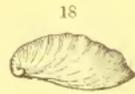
By **DAVID S. JORDAN** and **CHARLES H. GILBERT.**

Carcharias fronto, sp. nov. (28167.)

Allied to *Carcharias amblyrhynchus* Bleeker, but with much larger second dorsal.

a. Description of No. 28167, a young (female) example, 36 inches in length:

Body comparatively short and stout. Head very broad, depressed, broadly rounded anteriorly, the outline of the snout nearly parallel with that of the broad V-shaped mouth. Length of snout from mouth equal to half the distance between the angles of the month, or to the distance from the line connecting these angles to the chin, about six-sevenths the distance between the nostrils. Eye a little nearer nostril than angle of



mouth. Nostril a little nearer eye than tip of snout. Interorbital width a trifle more than half distance from snout to base of pectoral, about twice length of snout, measured from eye. Angle of mouth with a deep pit which scarcely extends as a furrow on either lip. Nostrils near margin of head, their length half their distance from eye, and about the same as length of eye, the anterior margin with a moderate flap. Teeth of both jaws narrowly triangular, more than twice as high as broad, those of the upper jaw rather broadest, all of them nearly erect and not evidently notched on the outer margin. Edges of teeth appearing minutely serrulate under a lens. Teeth about $\frac{20}{30}$.

Gill-openings rather deep, the last two over the base of the pectorals, the depth of them about equal to the distance from nostril to middle of eye, the branchial area scarcely longer than broad.

Free margins of all the fins concave. Insertion of first dorsal rather nearer pectorals than ventrals, its distance behind pectoral being nearly equal to the length of its anterior margin. Anterior lobe, when depressed, reaching past the base of the fin, but not to the end of the posterior lobe, which reaches nearly to the base of the ventrals. Length of base of first dorsal slightly more than its (vertical) height, and notably less than interorbital width. Distance between dorsals slightly more than twice the base of first dorsal, a little more than three times base of second.

Second dorsal similar in form to the first dorsal, its base one-fifth shorter, its posterior lobe reaching to within an eye's diameter of the pit at root of caudal.

Lower lobe of caudal half length of upper, both of the ordinary form in this genus; length of the upper lobe a little less than the distance from snout to posterior part of root of pectorals, a little less than one-fourth the total length.

Anal smaller than second dorsal and proportionately higher, its margin deeply concave, its anterior lobe reaching the tip of posterior when reflexed; length of anterior margin about equal to base of second dorsal. Distance of anal from caudal a little more than its base, and a little less than distance of front of anal from base of ventrals. Middle of anal under middle of second dorsal.

Ventrals moderate, their anterior margins about equal to the distance between the angles of the mouth.

Pectorals rather large, their angles not acute; their tips reaching a little past front of dorsal; their anterior margins half longer than interorbital width, and $2\frac{1}{2}$ times the free margin.

Color uniform slaty-gray; all the fins edged with darker brownish, darkest on the lower lobe of the caudal, but nowhere fully black.

b. Description of a large specimen:

A large example of this species, some 10 feet in length, was speared from the wharf at Mazatlan. The jaws of this specimen (collector's number, 997) were taken.

In this specimen the teeth of the upper jaw are broadly triangular, the breadth of the base being about equal to the vertical height, the inner margin nearly straight or slightly convex, the outer margin a little concave, but not distinctly notched. Edges of upper teeth conspicuously serrate, especially towards the base. Median tooth very broad and short, serrate, with concave margins.

Teeth of lower jaw narrowly triangular, with broad bases, which spread out abruptly. Edges of lower teeth weakly serrate; median teeth small, triangular, entire; middle teeth of sides of each jaw largest. Number of teeth about $\frac{28}{6}$.

The following notes on this specimen were taken by Mr. Gilbert. The measurements were taken without instruments as the shark was lying on the beach, and are not all entirely accurate:

Head very heavy and short, the snout exceedingly broad and short; its preoral portion much longer, shorter than distance between nostrils, and nearly equal to the length between the inner margins of the pectorals. Eyes on the depressed margin of the head, the nostrils very close to the margin. A short deep fold at angle of mouth, extending a very short distance on each lip.

Gill openings wide, the last two above base of pectorals, the longest slit about equal to half base of pectoral.

Origin of first dorsal behind vertical from posterior base of pectoral, a distance about equal to a gill-slit, the fin considerably nearer pectorals than ventrals. Anterior margin of dorsal two-thirds anterior margin of pectorals. Anal inserted slightly behind front of second dorsal and somewhat smaller than the latter; its length a little more than that of branchial area.

Pectorals long, not half longer than broad, their anterior margins convex; inner margin of pectoral about half longer than a gill-slit; about one-third the length of the free edge, which is six-sevenths the anterior edge.

Ventrals short; length of anterior margin less than one-third the length of pectorals, nearer second dorsal than first. Distance from anterior base of ventrals to vertical from first dorsal equal to distance of the posterior base from anal. A pit above and below root of tail. Caudal with lower lobe half length of upper, the lower lobe broadly scythe-shaped.

This species is rather common about Mazatlan, where it is known as *Tiburón*. Its liver is valued for the oil it produces. It was not seen elsewhere.

The fresh-water shark of Lake Nicaragua (*Eulamia nicaraguensis* Gill) is closely allied to this species, but apparently distinct.

Carcharias æthalorus, sp. nov. (28202, 29549).

Allied to *Carcharias lamia* (Risso), but with smaller dorsal and pectoral fins and longer and more pointed snout.

Body rather robust, the back somewhat elevated. Head depressed, but rather long and pointed, the snout low and flat, somewhat acute in outline. Length of snout from mouth just equal to the distance between the angles of the mouth, about half greater than the distance from the line connecting the angles of the mouth, forward to the chin. Eye moderate, a little nearer nostril than angle of mouth; distance from eye to nostril nearly two-thirds distance from nostril to tip of snout. Interorbital width less than half distance from snout to first gill-opening, slightly more than length of snout measured from eye.

Angle of mouth with a pit from which radiate three very short furrows. Nostrils not far from margin of head, their length equal to diameter of eye and rather less than half their distance from eye, the flap on the anterior margin nearly obsolete.

Teeth of both jaws narrowly triangular, nearly erect and not evidently notched on the outer margin; all the teeth distinctly though finely serrated on both margins. Lower teeth considerably narrower than upper and somewhat flexuous, more faintly serrate; their roots broad. Number of teeth about $\frac{2}{3}$.

Head without conspicuous pores. Gill-openings rather large, the last one shorter than the others, above base of pectoral, the depth of the middle one about equal to distance from nostril to middle of eye; the branchial area about half longer than broad.

Free margins of all the fins concave. Insertion of first dorsal close behind base of pectorals, its distance from the latter being not more than the diameter of the eye.

Anterior lobe when depressed extending beyond posterior lobe; distance from base of posterior lobe to ventrals somewhat more than length of snout from mouth. Length of base of first dorsal somewhat less than vertical height of the fin and equal to interorbital width. Distance between dorsals 2 to $2\frac{1}{3}$ times base of first dorsal, and about 4 times base of second.

Second dorsal much smaller than first; its posterior lobe longer than anterior and somewhat longer than base of fin, reaching to within $1\frac{1}{2}$ eyes' breadth of the large pit at root of caudal. Base of second dorsal nearly half length of first dorsal.

Lower lobe of caudal subfalcate, moderately pointed, two-fifths length of upper lobe, which is a little more than one-fourth the total length, and a little less than distance from snout to posterior part of root of pectorals. Anal a little longer than second dorsal and inserted nearly opposite its front; its posterior lobe extending considerably beyond the anterior when reflexed; length of its base nearly equal to its distance from caudal, a little less than distance from its front to ventral. Ventrals moderate, their anterior margins about three-fourths distance between angles of mouth.

Pectorals rather large, somewhat falcate, twice as long as broad, reaching to about opposite posterior part of base of dorsal, their tips

somewhat pointed, the length of the anterior margin $1\frac{2}{3}$ times interorbital width, and nearly $1\frac{1}{2}$ times the free margin; length of pectoral about one-sixth the total length of the fish.

Color light slaty-gray; belly white; middle line of back posteriorly and upper edge of tail blackish; tips of all the fins distinctly blackish, especially the pectorals and lower lobe of caudal.

This species is rather common at Mazatlan, where several young specimens were taken, the largest (29549), a young male, being 30 inches in length. A species thought to be the same was also seen at Panama, but no specimens were brought to the museum.

Carcharias longurio, sp. nov. (28306, 28330, 28331, 29541, 29551.)

? *Squalus* (*Scoliodon*) *porosus* Poey, *Memorias Cuba*, II, 339 tab. 19, f. 11, 12, 1861 (Cuba.) (Not *Carcharias porosus* Ranzani, 1839.)

? *Scoliodon porosus* Poey, *Synops. Pisc. Cubens*, 1868, 452. (Cuba.)

Subgenus *Scoliodon* Müller and Henle.

Body rather slender and elongate, the back little elevated. Head depressed, long and narrow, rather pointed anteriorly. Length of snout from mouth greater by about the diameter of the eye than the distance between the angles of the mouth and a little more than half greater than the distance from a line connecting the angles of the mouth to the tip of the chin.

Eye rather large, a little nearer nostril than angle of mouth; distance from eye to nostril scarcely half the distance from nostril to tip of snout.

Interorbital width two-fifths distance from snout to first gill-opening, somewhat less than length of snout measured from eye.

Angle of mouth with a pit from which a furrow extends on the lower lip a distance about equal to the length of a nostril, and on the upper lip considerably farther. Length of nostril about two-thirds diameter of eye, and about half its distance from eye, the anterior margin with a narrow projecting flap. Distance between outer angles of nostrils slightly more than their distance from tip of snout.

Teeth of the upper jaw subtriangular, very oblique, deeply notched on the outer margin, those of the lower jaw similar, narrower and rather less oblique. Bases of upper teeth with a few weak serrations. No evident serrations on enameled parts of any of the teeth. Number of teeth about $\frac{25}{3}$. Teeth all somewhat narrower and less oblique than in *Carcharias* (*Scoliodon*) *terre-nove*.

Gill-openings narrow, the last two over base of pectoral, the depth of one about $\frac{2}{7}$ the distance from snout to mouth, the middle or largest about half the length of the branchial area; first and last gill-openings about equal.

Top of head with numerous mucous pores. A series of numerous large pores in a line above angle of mouth, and a band of them behind eye, extending upward on the nape. Under side of snout with many

minute pores, these forming an elliptical area on the lower side of snout, outside of which on each side is a crescent-shaped area of pores.

Insertion of first dorsal well behind pectoral, but much nearer to pectoral than ventral; its distance behind posterior base of pectoral $1\frac{2}{5}$ in preoral part of snout.

Anterior lobe of dorsal, when depressed, not reaching the tip of the posterior lobe; the distance to the base of posterior lobe from ventrals nearly half preoral part of snout.

Length of base of first dorsal about equal to the height of the fin, or to the interorbital width, about one-third the distance between dorsals, which is 10 times base of second dorsal.

Second dorsal very small, its free margin scarcely concave; the pointed posterior lobe nearly twice the anterior.

Caudal, $4\frac{1}{4}$ in total length; its lower lobe bluntish, about $\frac{2}{5}$ the upper; length of caudal equal to distance from snout to base of pectoral.

Anal fin small, but considerably larger than second dorsal, inserted in front of the latter, so that its posterior part is below the insertion of the dorsal. Length of anal about equal to its elongate posterior lobe, and less than half its distance from the ventrals. Ventrals moderate, their anterior margins two-thirds distance between angles of mouth.

Pectorals rather small, not quite reaching middle of first dorsal, their tips bluntish, the length of the anterior margin $1\frac{2}{5}$ times interorbital width and $1\frac{1}{4}$ times the free margin. Pectoral scarcely more than one-eighth the total length of the fish.

Color slaty-gray with a distinct bluish tinge; white below; upper edge of tail and tip of caudal dusky; vertical fins faintly margined with dark.

This species is common in the harbor of Mazatlan, where five specimens were obtained; the largest of these (28330), a male, 32 inches long, is apparently nearly mature, the claspers reaching the anal. It has especially served for the basis of the above description.

Our specimens agree in most respects with Professor Poey's accounts of his *Scoliodon porosus* from Cuba. If the generic value of the group called *Scoliodon* be not admitted, the latter species must receive a new name, as there is already a *Carcharias porosus* Ranzani.

Carcharias, sp. incog.

The jaws of a large shark were obtained at Mazatlan, the species of which we have not been able to ascertain. The following is a description of the teeth:

Teeth $\frac{2}{3}\frac{2}{2}$. Teeth of the upper jaw rather narrowly triangular, the tip rather strongly curved outward; the inner margin rather strongly convex, the outer rather strongly concave; the outer margin with a broad, shallow basal angle, a continuation of the curve of the outer edge of the tooth. Both margins of the teeth strongly serrate, the serræ stronger

on the outer margin towards the base of the tooth. Upper jaw with a moderate, triangular median tooth, denticulated like the others.

Lower teeth very different in form, long, slender, sharp, straight, subterete, rising from broad roots, somewhat turned outward, but more erect than the upper teeth. No distinct notch on outer margin, where a slightly obtuse angle is formed. Edges of lower teeth everywhere strictly entire.

Its relations seem to be, so far as can be judged by the teeth, with such species as *Carcharias tjutjot* Bleeker and *C. menisorrh* Val., members of the "genus" *Platypodon* Gill.

Mustelus lunulatus, sp. nov. (29211.)

Allied to *Mustelus canis* (Mitch.) Dek.

Body elongate; the back little elevated. Head depressed, rather long and pointed; length of snout from mouth about one-sixth more than the distance between angles of mouth, and nearly twice the length of the mouth, from a line connecting the angles, to the chin. Eye oblong, large, a little nearer angle of mouth than nostril; distance from eye to nostril three-fifths distance from nostril to tip of snout. Interorbital space narrow, $2\frac{1}{2}$ times in distance from snout to first gill-opening, somewhat less than length of snout as measured from eye. Angle of mouth with a pit from which furrows extend on each lip for a short distance, about equal on each lip and considerably less than length of nostril. Nostrils inferior, large, their length a little more than half eye and nearly half their distance from eye; the anterior flap large; posterior flap turned inward, half as long as eye. Distance between nostrils 3 in snout as measured from eye.

Teeth, as in *M. canis*, paved; some of the inner teeth somewhat pointed; spiracles small, but evident; head without conspicuous mucous pores. Gill-openings small, the last two above base of pectoral, the depth of the middle one about equal to the length of the eye, and less than the length of the branchial area.

All the fins with their free margin notably lunate or concave. Insertion of first dorsal well behind pectorals, and nearly opposite the tip of the inner lobe of the latter, the outer lobe extending about to the middle of the fin; distance of insertion of first dorsal from anterior root of pectorals about $\frac{1}{2}$ its distance from tip of snout. First dorsal high, its anterior lobe when depressed reaching a little past tip of posterior lobe. Length of base of first dorsal about equal to its vertical height, and nearly half greater than interorbital width. Distance between dorsals $2\frac{2}{3}$ times base of first and a little more than 3 times base of second. Posterior angle of dorsal produced but not reaching to vertical from front of ventrals. Middle of dorsal nearer pectoral base than ventral base by a distance nearly equal to the diameter of the eye.

Second dorsal not very small, proportionately lower than first, its

posterior lobe extending farther than the anterior when depressed, its distance from base of caudal more than the length of its base.

Lower lobe of caudal short but pointed; tail forming a little more than one fifth the total length, its length about equal to distance from snout to front of pectorals. Terminal lobe about two-fifths length of tail.

Anal much smaller than second dorsal, its posterior margin a little behind posterior margin of the latter. Ventral moderate, its distal margin concave, the angles sharp. Pectorals comparatively sharp, half longer than broad, three fourths to four-fifths length of head (to first gill-slit), their length 7 to $7\frac{1}{2}$ in total.

Color very light gray above, pale below; fins all pale.

Two half-grown specimens about 20 inches long, both numbered 29,211, were obtained at Mazatlan, where it is known to the fishermen as "Gato."

The following analysis of American species of *Mustelus* shows the relation of *M. lunulatus* to the other species of this genus:

- a. Middle of first dorsal evidently nearer root of pectoral (posteriorly) than root of ventral (anteriorly); snout long, its length from mouth more than width of month; teeth bluntnish; free margins of fins concave; first dorsal high, its narrow anterior lobe reaching tip of the slender posterior lobe when reflexed; the fin about as high as long. Interval between dorsals $2\frac{3}{4}$ times base of first; lower lobe of caudal pointed; tail 5 in body, its terminal lobe more than one-third its length; pectorals rather sharp, their free margin incised, their tips about reaching middle of dorsal; embryo unknown (probably without placenta); color pale.....LUNULATUS.
- aa. Middle of first dorsal about midway between pectorals and ventrals; snout shorter, its length from month about equal to width of month.
 - b. First dorsal higher than long, the tip of anterior lobe usually reaching, when depressed, beyond tip of posterior lobe, its free margin deeply incised, its base $2\frac{1}{2}$ times in interval between dorsals; teeth bluntnish; lower lobe of caudal blunt; tail more than one-fifth body, its terminal lobe more than one-third its length; pectorals rather obtuse, their free margin little incised, their tips reaching first third of dorsal; inner lobe of ventrals produced; embryo not attached to uterus by a placenta; colors rather pale.....CANIS.*
 - bb. First dorsal longer than high, its tip not reaching tip of posterior lobe, its free margin scarcely incised, its base about half the interval between dorsals; teeth rather sharp (in adults?); lower lobe of caudal not acute; tail less than one-fifth total length, its terminal lobe less than one-third its length; pectorals obtuse, their free edges almost straight, their tips reaching first fourth of dorsal; inner lobe of ventrals not produced, the free edge of the fin straight; embryo unknown (probably with placenta); color rather dark, axils of pectorals and ventrals dusky.....DORSALIS.†

* *Squalus canis* Mitchill, Trans. Lit. and Phil. Soc. N. Y. i, 1815, 486: = *Mustelus asterias* Cloquet, Dict. Sci. Nat. xiv, 407, 1820: = *Squalus hinnullus* Blainv. Faune Française, 1820-'30, 83: = *Mustelus vulgaris* Müller & Henle, Plagiost. 1839, 64, and of many authors. Cape Cod to Cuba and on all coasts of Southern Europe. We are thus far unable to detect any permanent difference between European and American specimens. The American name has clear priority.

† *Mustelus dorsalis* Gill, Proc. Ac. Nat. Sci. Phila. 1864, 149. Panama (Gill; Gilbert).

aaa. Middle of first dorsal much nearer root of ventrals than pectorals; snout rather short, its width a little greater than distance between angles of mouth. First dorsal longer than high, its blunt tip when depressed not reaching tip of posterior lobe, its margin deeply incised, its base $2\frac{1}{4}$ times in the interval between dorsals; teeth rather sharp; lower lobe of caudal blunt; tail less than one-fifth length of body, its terminal lobe more than one-third its length; pectorals rather obtuse, their free margin little concave, their tips reaching little past front of dorsal; inner lobe of ventrals somewhat produced; embryo attached to uterus by a placenta; color rather dark; axils of pectorals and ventrals dusky.....CALIFORNICUS.*

DESCRIPTION OF A NEW SHARK (CARCHARIAS LAMIELLA) FROM SAN DIEGO, CALIFORNIA.

By DAVID S. JORDAN and CHARLES H. GILBERT.

Allied to *Carcharias lamia* (Risso).

Body comparatively robust, the back elevated, the greatest depth half more than the height of the dorsal fin and equal to the distance from the nostril to the gill-openings.

Head broad and flat, the snout long, but wide and rounded. Length of snout from mouth greater than the distance between outer angles of nostrils, a little more than width of mouth. Nostrils considerably nearer the eye than tip of snout, but nearer snout than angle of mouth. Eyes moderate.

Teeth about $\frac{3}{10}$, not very large, the upper rather narrowly triangular, nearly erect, slightly concave on the outer margin, but not notched, rather finely serrated everywhere. Lower teeth similar, but considerably narrower, finely serrated. Middle teeth in both jaws smaller than the others.

A pair of jaws taken from a much larger specimen have, as usual, the teeth considerably broader than in the young and more distinctly serrate. They are quite similar to the teeth of *C. lamia*.

First dorsal beginning at a distance four-fifths the length of its own base behind the root of pectorals, and ending at a point somewhat more than its own base before the ventrals, its height slightly more than the distance from the snout to the posterior margin of the eye, slightly more than its base, and considerably less than greatest height of body. Space between dorsals equal to the distance from snout to first gill-opening, $2\frac{2}{3}$ times base of first dorsal, 7 times base of second.

Second dorsal very small, not one-sixth the size of the first and considerably smaller than the anal, which is deeply emarginate, the two fins nearly opposite each other. Ventrals small, nearly midway between the two dorsals. Tail long, forming nearly two-sevenths of the total length. Pectorals broad and long, not pointed, their tips reach-

* *Mustelus californicus* Gill, Proc. Ac. Nat. Sci. Phila. 1864, 148: = *Mystelus hiunulus* Jor. & Gilb. Proc. U. S. Nat. Mus. 1881, 31 (not of Blainville). Coast of Southern California, San Francisco, Monterey, Santa Barbara, San Pedro, San Diego (Jor. & Gilb).