

PLATE I.

- FIG. 1. Cranium of *Amia calva* from above; life size. The dark piece projecting at the lower right-hand angle is the continuation of *Sc*. The little piece at the anterior end of the frontal suture is in cartilage, as is *ol*, and the triangular wedge at the inner end of *Esc*. Sagemehl's original plates have all the cartilage tracts in color, a pale blue. This could not be carried out in the present connection. The lightly stippled and unlettered parts, generally, are in these figures, however, the cartilaginous tracts.
- FIG. 2. The same specimen, cranium seen from below.
- FIG. 3. The same specimen, the parasphenoid (*Ps.*) and the vomers (*Vo*) having been removed. (These three figures copied from Sagemehl's plates by Mr. H. L. Todd.)

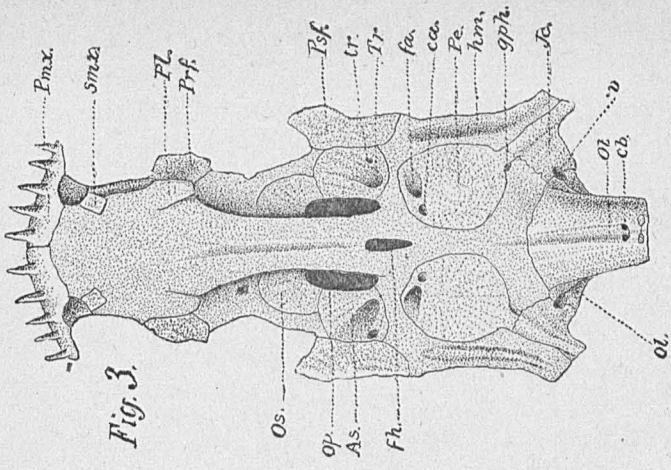
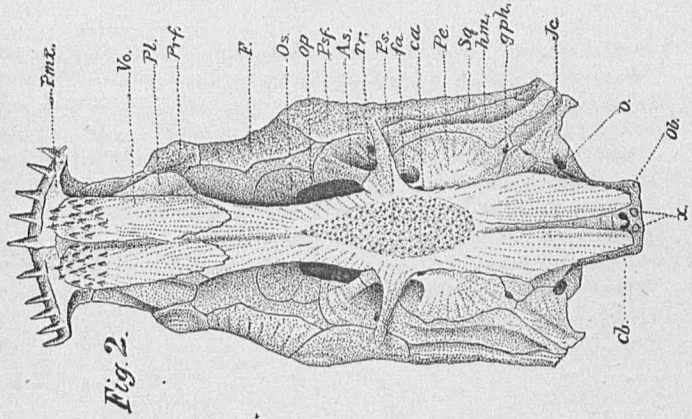
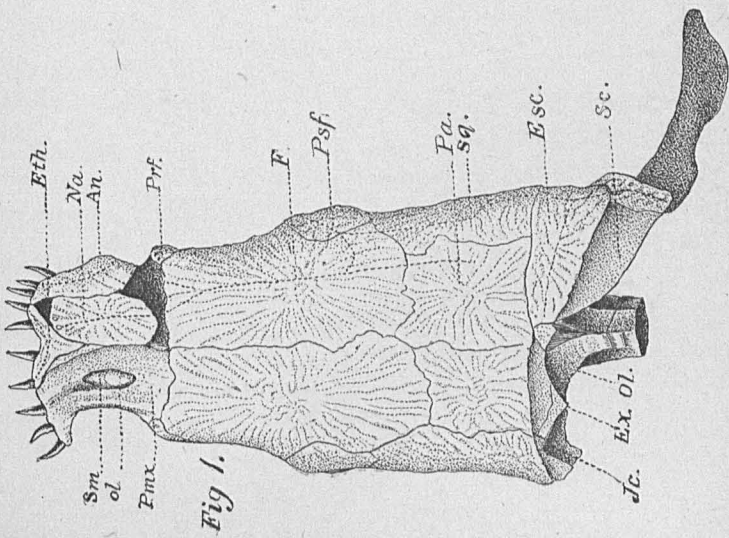


PLATE II.

- FIG. 4. The skull of *Amia calva* vertically bisected through the median line; same specimen; life size. (After Sagemehl.)
- FIG. 5. The same; lateral view of the cranium before bisection. (After Sagemehl.)
- FIG. 6. Primoidal cranium of *Amia calva*; same specimen as before, viewed from above after the removal of all the "cover bones;" life size. The cartilage tracts here are between the premaxillaries (*Pmx*); at *ol*; all the central portion and the lateral fossæ, *ta*. (After Sagemehl.)
- FIG. 7. Superior view of the skull of *Amia calva*, with all the "cover bones" *in situ*. Life size. (After Franque.) The figures in this plate copied by Mr. H. L. Todd from the author's figures as given.

PLATE III.

- FIGS. 8 and 9.** Transverse sections through the cranium of *Amia calva* in the region of the nasal pits. Fig. 8 the anterior section, and they follow in sequence through Fig. 12. The sections are diagrammatic; with the cartilaginous parts stippled. (After Sagemehl.) Copied by Mr. H. L. Todd.
- FIGS. 10, 11, and 12.** Similar sections through the region of the optic foramen, the facial foramen, and the labyrinth region just anterior to the foramen for the glossopharyngeal, respectively. (After Sagemehl.) Copied by Mr. Todd.
- FIG. 13.** Posterior view of the cranium of the same specimen of *Amia calva*. Life size. (After Sagemehl.) Copied by Mr. Todd.
- FIG. 14.** Three vertebrae of *Amia calva*, magnified about three times, showing the method of articulation of the neural spines and the facets for the ribs. (After Franque.) Copied by Mr. Todd.
- FIG. 15.** Left lateral view of mandible of a Teleostean fish (*Micropterus salmoides*). Life size. Drawn by the author from his own dissections. The various bones pulled apart to show their entire shape.

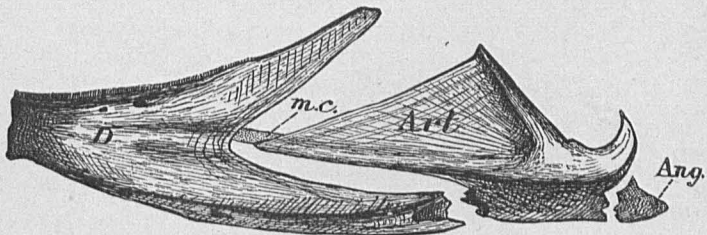
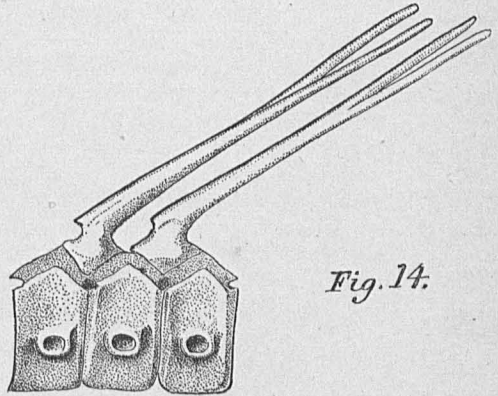
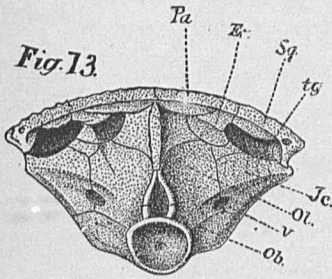
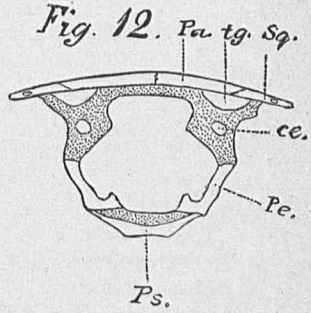
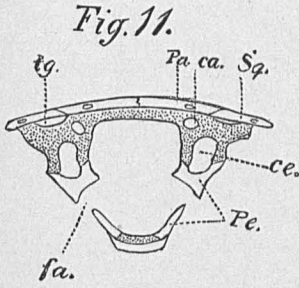
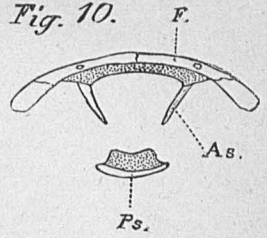
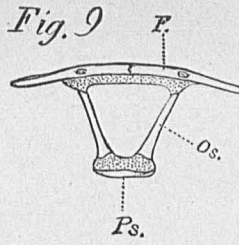
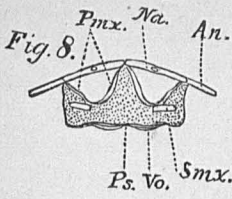


Fig. 15.

PLATE IV.

FIG. 16. Right lateral view of the skull of *Amia calva*, showing the arrangement of the Ganoid plates. Life size from nature, by the author. This specimen was collected by me near New Orleans, La., in 1883.

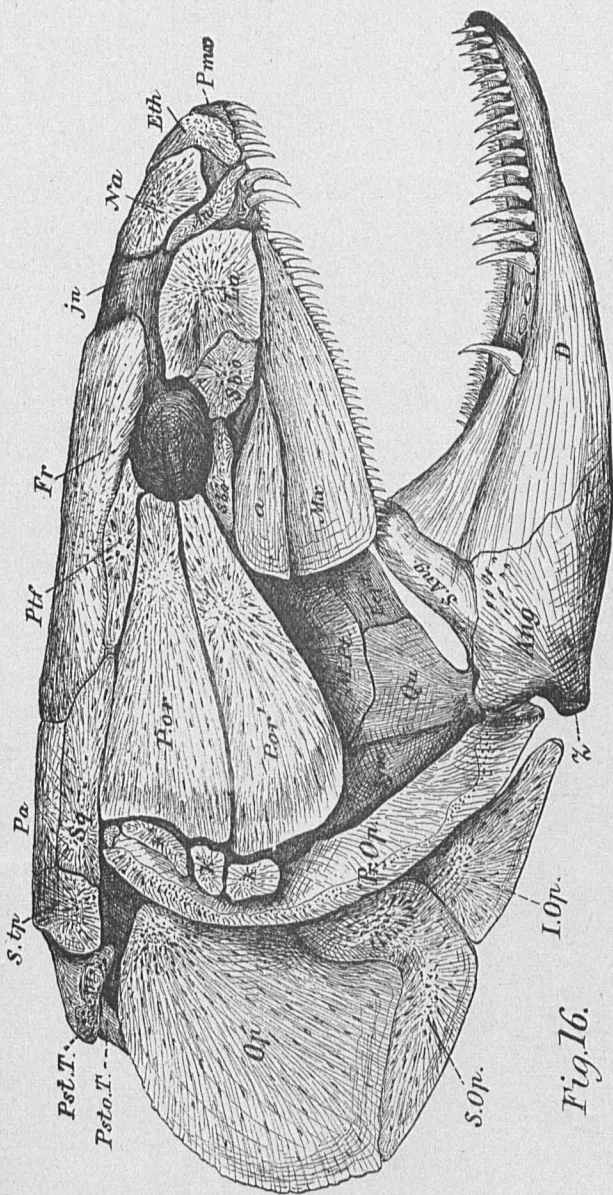


Fig. 16.

PLATE V.

- FIG. 17. Inner aspect of the right half of mandible of *Amia calva*, the splenial element removed. (By the author, after Bridge, somewhat enlarged.)
- FIG. 18. The same view from a specimen in my own possession; the splenial element *in situ*, together with the bones connecting it with the symphysis. Enlarged. (From nature, by the author.)

Fig. 17.

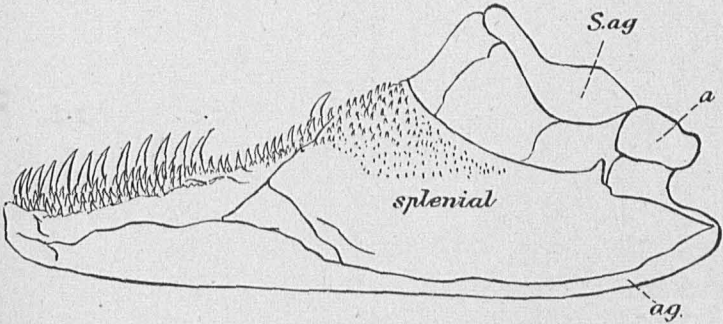
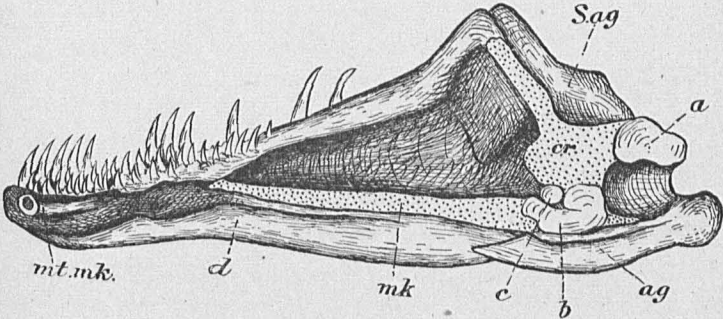


Fig. 18.

PLATE VI.

FIG. 19. The palatopterygoidean arcade of *Amia calva*, together with other associated bones and the hyoidean arch, to the outer side of which articulate the twelve branchiostegal rays, *Brs. R.* The dotted portions about the hypohyal, metapterygoid and epihyal represent cartilage, but all other cartilaginous and membranous portions have been carefully removed. This figure well shows the relation of the hyoidean arch to the other bones represented, as it does the position occupied by the semi-anchylosed preoperculum. Life size from nature, by the author.

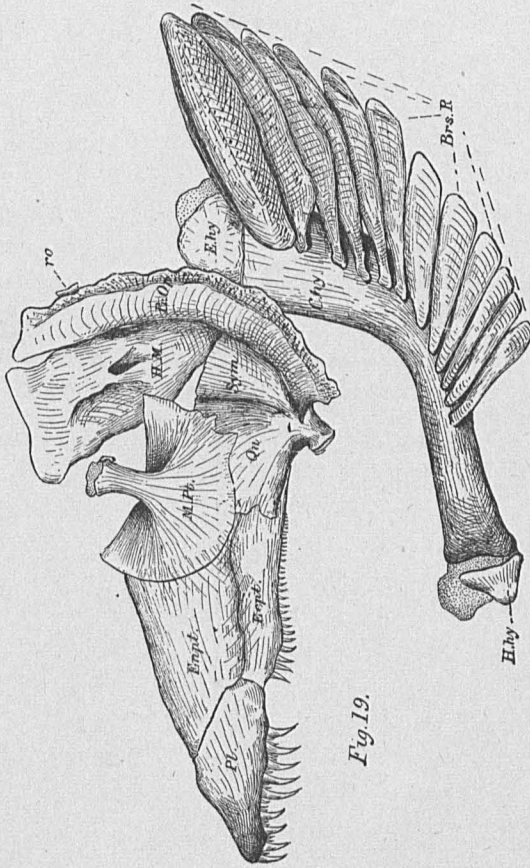


Fig. 19.

PLATE VII.

- FIG. 20. Inferior aspect of the mandible of *Amia calva*, showing the normal position of the gular plate, *G. pl.* Life size from nature, by the author.
- FIG. 21. A longitudinal, vertical, median section of the cranium of a perch (*Perca americana*), inside view showing the relations of the various bones, the position of the *otolith*, the eye-muscle canal, and the bones that enter into the ear capsule. Adult. Slightly enlarged from nature, by the author, from his own dissections.

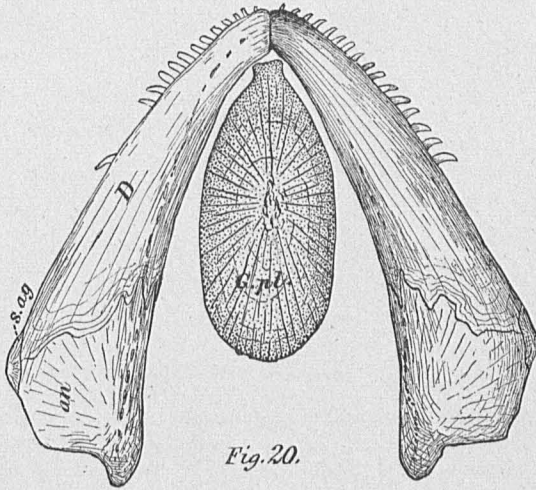


Fig. 20.

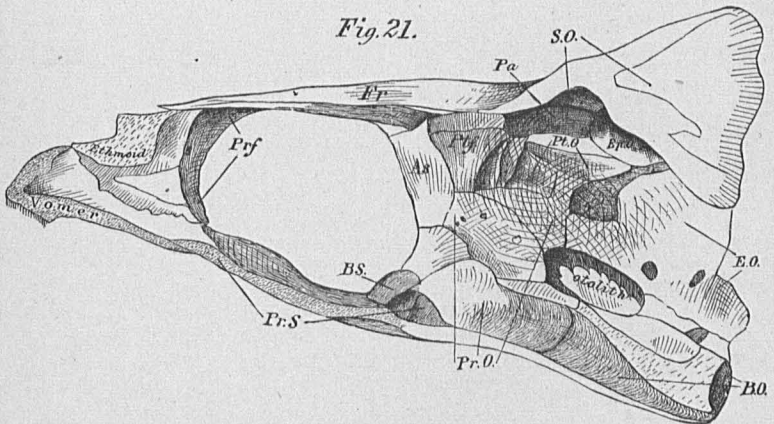


Fig. 21.

PLATE IX.

FIG. 25. The skeleton of the caudal extremity of *Amia*. The five small rods of bone, referred to by the letters *jj*, are the continuation of the interneural spines. These have not been previously described, and were overlooked by Franque, consequently do not appear in his figure. Taken in connection with the free spines found over the anterior vertebræ of the column, these bones rather lead me to believe that in the early ancestors of *Amia* the fin was continuous, from base of cranium to include the tail. Life size from nature, by the author.

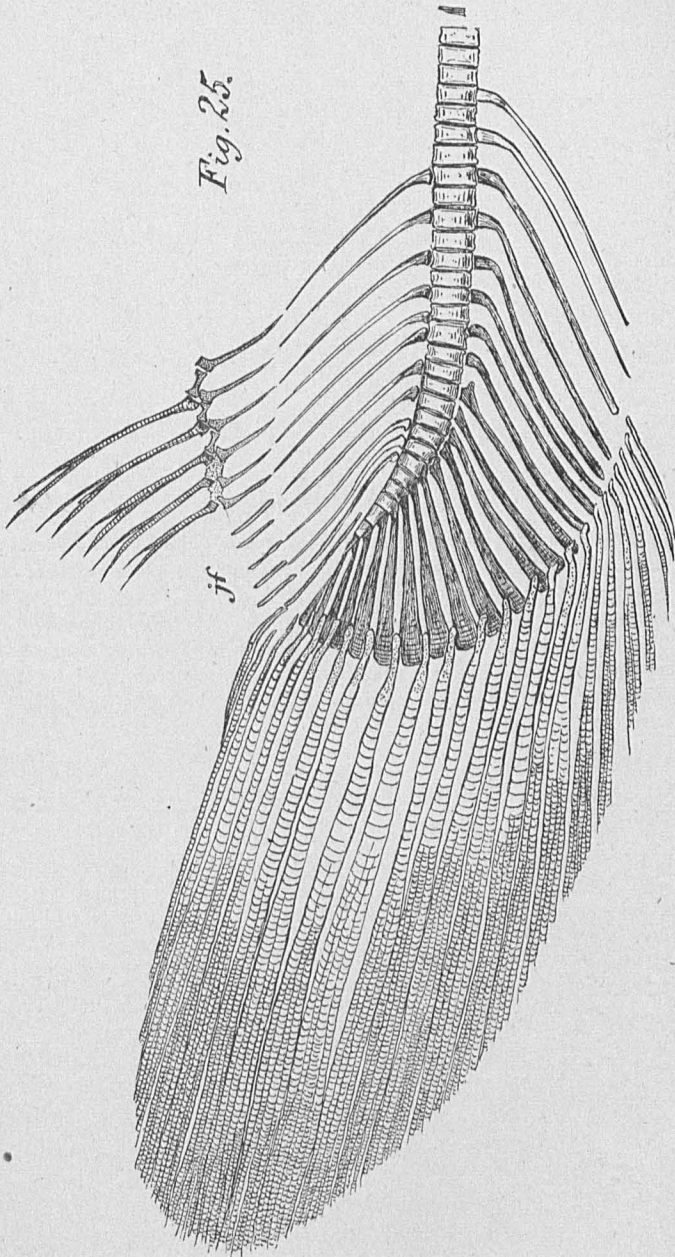


PLATE X.

FIG. 26. Left lateral view of the skeleton of *Amia calva*. Copied by Mr. H. L. Todd from Franke's figure and considerably reduced.

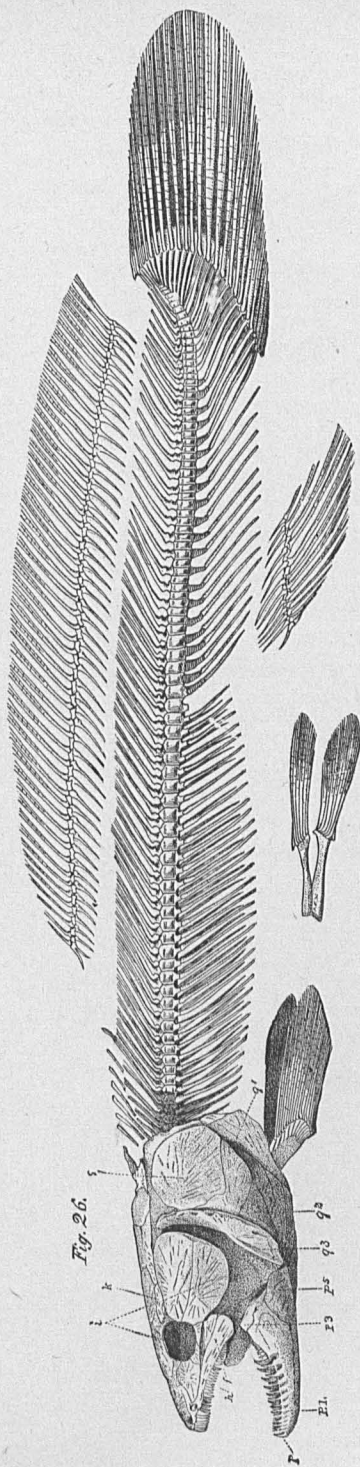


Fig. 26.

PLATE XI.

FIG. 27. Left lateral view of the skull of *Micropterus salmoides*, with the skeleton of other parts connected with it posteriorly. This figure is designed to show the relation of the bones, arranged *in situ*, of this part of the skeleton in a typical teleostean fish. Life size from nature, by the author, from his own dissections.

PLATE XII.

FIG. 28. Palatoquadrate arch, nearly complete, right side, inner aspect, of *Albula vulpes*. Same specimen as shown in Fig. 29. The area of teeth are seen just above the letters *Ecpt.* Life size. Drawn by the author from a specimen kindly lent him by Prof. Theodore Gill, from his private cabinet.

FIG. 29. Right lateral views of cranium of *Albula vulpes*, and the greater part of the palatoquadrate arch. Same specimen as figured in Fig. 28. Life size from nature, by the author, from the specimen in Professor Gill's cabinet.

Fig. 28.

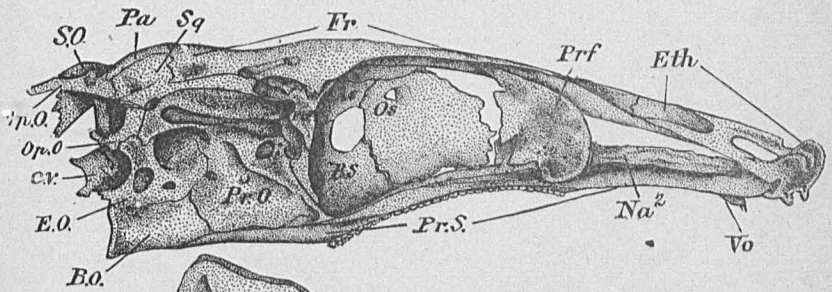
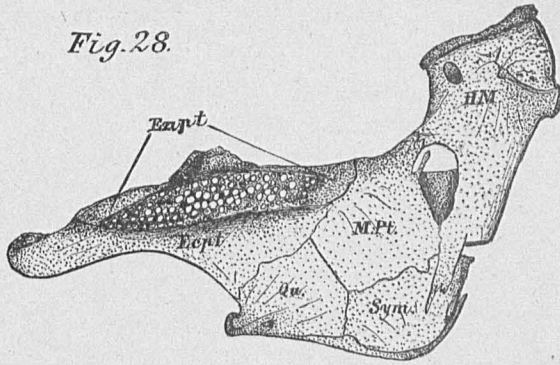


Fig. 29.

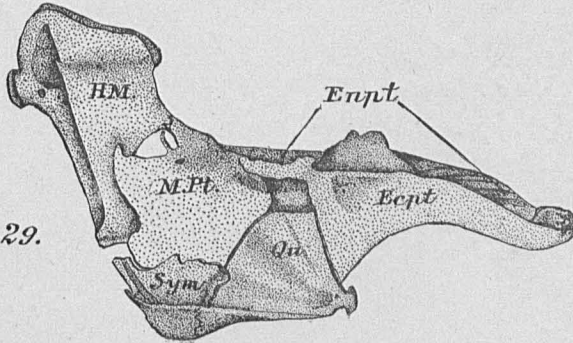


PLATE XIII.

- FIG. 30.** Superior view of the cranium of *Albula vulpes*. From the same specimen of which the lateral view is shown in Fig. 29 of this paper. Life size from nature by the author.
- FIG. 31.** Inferior view of the cranium of *Albula vulpes*. The elliptical area of teeth are here seen upon the parasphenoid, *Pr. S.* Same specimen as in Fig. 30, from Professor Gill's collection. Life size, from nature, by the author.
- FIG. 32.** Inner aspect of opercular bones, hyoid, symplectic, and other elements of *Micropterus salmoides*. Left side. Designed to show the relations of these parts as found in a typical teleostean fish. Life size from nature; drawn by the author from his own dissections.

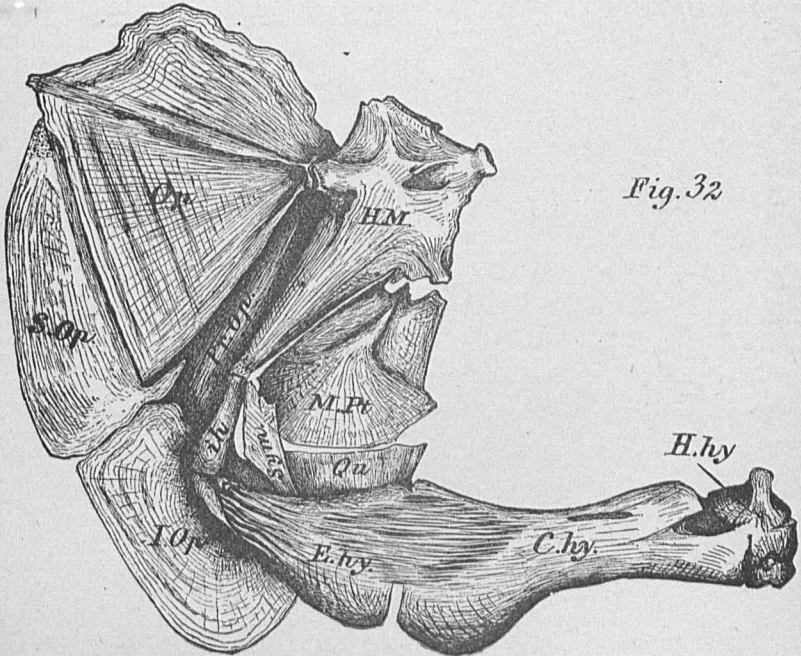
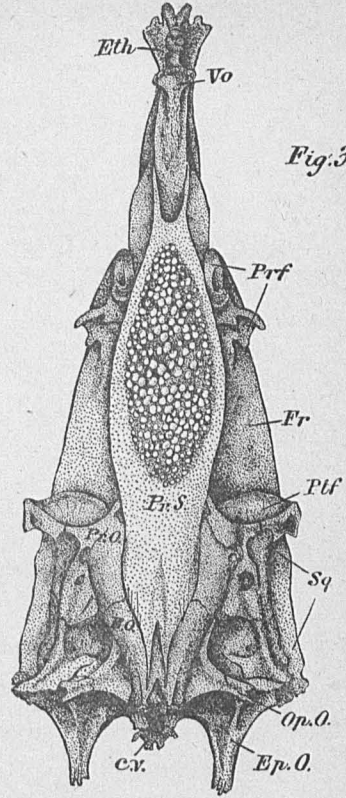
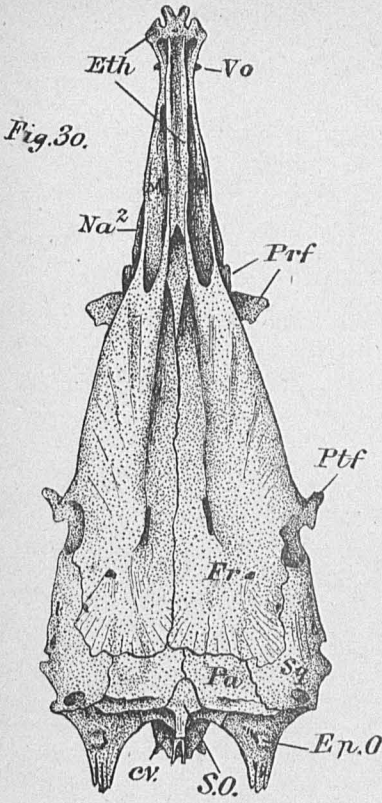


PLATE XIV.

- FIG. 33. Posterior view of the cranium of *Megalops*. The first vertebra of the column is ankylosed with the basioccipital, and is referred to by the letters *c. v.* Life size.
- FIG. 34. Right lateral view of the cranium of *Megalops*. Missing parts are seen from this aspect, as the parietals and basisphenoid. The normal position of this cranium would have the parasphenoid, *Pr. s.*, in the horizontal plane, but it is represented this way to save space. This specimen is the same as seen in Fig. 33, and both were drawn by the author from a specimen kindly lent him by Professor Gill from his private cabinet.
- FIG. 35. Outer aspect of part of shoulder girdle, and the pectoral fin of *Micropterus salmoides*. Life size. Drawn by the author from his own dissections.

Fig. 33.

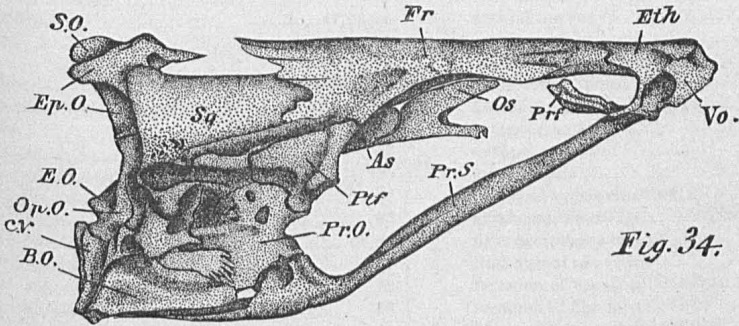
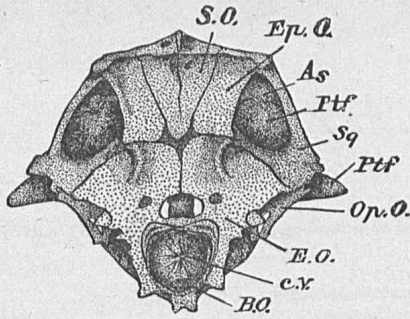


Fig. 34.

Fig. 35.

