ON FOSSIL FISH-TEETH FROM THE NICOBAR ISLANDS.[1]

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(Communicated by Rai Bahadur S. L Hora, D.Sc., F.R.S.E., F.N.I.)

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The fossil fish-teeth described below were sent by the Geological Survey of India to Dr. S. L. Hora for identification. After a preliminary study, he handed over the material to me for a detailed report. I am very grateful to him for affording me an opportunity to study these interesting fossils.

The history of these specimens is very meagre. They were collected along with specimens of celts and rocks on the Trincat Island, Nicobars, and presented to the Geological Survey of India in March 1941 by Mr. R. H. Scott, K.I.H., Assistant Commissioner, Nicobars, the Andamans. No further information regarding the localities, etc. from which the material was collected is available.

Class **Elasmobranchii.**

Genus *Carcharodon* M. and H.

This is an imperfect tooth of a shark. The base towards the sides is broken off and the enamel coating near the tip of the crown on its outer surface is also chipped off in certain

[1] Published with permission of the Director, Zoological Survey of India. This paper had been accepted in 1942 for publication in the *Rec. Geo. Surv. Ind.*, but due to the cessation of publication of the journal, it could not be published. My grateful thanks are due to the Director, Geological Survey of India, for permitting me to publish this article in the *Proc. National Inst. Sci. India.*—K. K. Nair, Supdt. of Fisheries, Bengal.

areas. The tooth had presumably been used as an implement of some kind and as a result the lateral serrations which are of importance for specific identification have disappeared while the outer surface is polished to a considerable degree. However, enough traces of serration are left in some places (Pl. IV, fig. 3) for the identification of the tooth.

The crown of the tooth is fairly large and triangular. Its outer surface is highly convex while the inner is more or less flat, with the apex of the crown gently bending inwards. The base of the tooth is concave. Both the outer and inner surfaces of the crown are ornamented with vertical striae which are more in number on the outer convex surface than on the inner flat surface. The lateral edges and the tip are thin and sharp, but this may be due to the grinding which the tooth had been subjected to while in use as an implement. The lateral edges are definitely serrated, though in the specimen, they are not easily made out. The greatest thickness of the tooth, 18 mm., is in the centre of the crown towards the base. The whole tooth is grey coloured.

This tooth is apparently of a shark of the genus *Carcharodon* Müller and Henle, species of which, according to Zittel possess large teeth and are abundantly represented in the Tertiary and later formations of nearly all parts of the world, and also on the beds of existing oceans. They are mostly Tertiary but one species is reported from the Upper Cretaceous and one recent species is also known.

With the kind permission of Mr. V. P. Sondhi, Assistant Director, Geological Survey of India, I was able to study and compare some of the type specimens of *Carcharodon* fossil teeth in the collections of the Geological Survey of India with the above specimen. This tooth exhibits striking resemblance to some teeth of *Carcharodon megalodon* Agassiz. The lateral edges are bent since the tooth itself is slightly arched inwards, as in the case of the type-specimen, No. 7780 of the Geological Survey of India, which was identified and described as a lateral tooth of *C. megalodon* Ag. by Noetling. Presumably the unequal lateral sides might have influenced the author to assign to it a lateral position. Noetling was not sure of the horizon from which his material came, but Stuart (1910) in a later article says that the specimen was collected by Noetling from the Pegu shales at Padaukpin. The age of the Pegu shales is believed to be Middle Tertiary. The sides of the fossil tooth described above are symmetrical, and its general shape is exactly like that of an imperfect tooth described and identified by Martin as of *Carcharodon megalodon* Ag. from the Tertiary of Europe. In the absence of the marginal serrations referred to above it is not possible to definitely assign the tooth to any species of *Carcharodon*.

Genus *Oxyrhina* Agassiz (Pl. IV, figs. 4-5.)

The crown and the base of this tooth are fully exposed. The inner surface of the crown is convex while the outer surface is flattened. The convex surface, just above the base, is slightly constricted in the middle region. The tip of the crown is slightly hooked laterally and as a result the sharp lateral edges of the tooth are unequal. The convex surface bears a number of vertical striae more or less confined to the middle region. The enamel of the crown descends lower at the sides than at the centre so that the boundary line is in the shape of an obtuse angle. Lateral denticles are absent in this specimen. The whole crown is highly polished, of an ivory white colour resembling somewhat the claw of a tiger.

This tooth does not possess any crenulations or longitudinal ridges on the crown near the base, as in some of the type-specimens of *Oxyrhina triangularis* Egerton or *O.* (*Meristodon*) sp., preserved in the collections of the Geological Survey of India. But its general shape, absence of lateral denticles and serrations along the lateral edges would justify its reference to the genus *Oxyrhina* Agassiz, species of which are distributed from the Cretaceous to the recent times.

Class **Teleostei.**

Genus *Diodon* Linn (Pl. IV, figs. 6, 7 and 8).

The three available pieces, *a*, *b*, and *c* are the inner dental plates of a species of the genus *Diodon* Linn. These plates are situated immediately behind the modified jaws, both the upper and the lower. The pieces (*a*) and (*b*) appear to belong to the same plate (Pl. IV, figs. 7 and 8), while piece (*c*) (Pl. IV, fig. 6) belongs to a different species.

The dental plates are formed by more or less oblique piles of lamellae with crenulated edges closely pressed together. The lamellae are unequal in size; the biggest lamellae lie near

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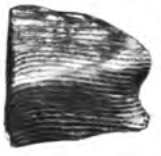
2.

3.



6.

7.

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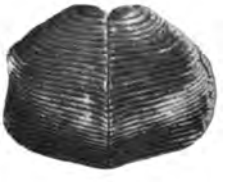

8.

the middle and the smallest are at the apex. These lamellae are divided into symmetrical halves by a vertical line. On the exposed face, there is a sort of rough parallelogram, with its longest axis transversely placed, slightly raised from the rest of the face. The parallelogram in its turn shows a gradual concavity in the centre. There are about twenty-seven closely packed lamellae in this plate (Pl. IV, figs. 7 and 8).

This dental plate differs from that of *Diodon scillae* Agassiz (Woodward, pp. 572-573) in not possessing a constricted waist, while it differs from *D. foleyi* from Ramri Island, off the Arakan Coast (Lydekker, 1880, pp. 59, 60), in not having a pronounced concavity on the exposed face. In *D. ventus* (Leidy, pp. 255-256) the number of lamellae is very small, about ten. The apex of the dental plate of *D. sigma* (Martin, pp. 726-727; Rothpletz and Simonelli, Pl. xxxvi, figs. 1, 1*a*) is rather truncate and not slightly tapering as in the present specimen; further there are only about eighteen lamellae in it. The dental plate of *D. sinhaleyus* (Deraniyagala, pp. 365-366) also does not agree fully with the tooth in question, for the apex is more or less ovate and there is a much smaller number of lamellae in it. Out of the two common recent species, only one, *Diodon histrix* Linn., possesses an inner dental plate. This plate, while it is similar in shape to the fossil plate in question, has a smaller number of lamellae. Hence this plate has to be left as belonging to species of the genus *Diodon* which according to Zittel occurs in the Eocene, Oligocene and Miocene.

The specimen *c* (Pl. IV, fig. 6) is one-half of the inner dental plate of a species of *Diodon*. It differs from the two halves described above in having a sort of constricted waist and resembles closely the inner dental plate of *Diodon scillae* Ag., as figured by Woodward in his 'Catalogue of Fossil Fishes in the British Museum'. *Diodon scillae*, according to Woodward, has been reported from the Miocene of Italy, Sicily and Malta.

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Explanation of Plate IV.

Fig. 1.—Outer surface of an imperfect tooth of *Carcharodon* Müller and Henle.
Fig. 2.—Inner surface of the same.
Fig. 3.—Side view of the same.
Fig. 4.—Inner surface of a tooth of *Oxyrhina* Agassiz.
Fig. 5.—Outer surface of the same.
Fig. 6.—Front view of one-half of the inner dental plate of *Diodon* Linn.
Fig. 7.—Back view of a dental plate of *Diodon* Linn.
Fig. 8.—Front view of the same.