

DISCUSSION AND CORRESPONDENCE.

CAUSES OF THE SUDDEN DESTRUCTION OF LIFE IN
THE MARTINIQUE VOLCANIC ERUPTION.

TO THE EDITOR OF SCIENCE: During many years of teaching geology I have held in opposition to most text-books on the subject that explosive gases are evolved during violent volcanic eruptions and that the flames seen by eye witnesses do actually exist, independent of lightning and the glow of the hot lava reflected from the jet of steam, etc., which are usually given as the explanation of the appearance of flames.

My view has been that the heat is sufficient to cause the dissociation of hydrogen and oxygen from the water, on coming suddenly into contact with highly heated lava; and in case of sea-water the chlorine would also be dissociated from the sodium.

These gases suddenly ejected with great violence and exploding in the air, above the crater, would produce precisely the effects witnessed on an unusually large scale at Martini-que.

The people were mostly killed by the sudden explosion of a vast volume of hydrogen and oxygen, which will account for the sudden burning of flesh and clothes, as well as of the buildings and vessels.

The chlorine, at the same time, combining with some of the hydrogen would produce hydrochloric acid, a poisonous and suffocating gas, which would quickly kill most of those not instantly destroyed by the explosion.

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THE WHALE-SHARK (*Rhinodon typicus*) AS AN
AMERICAN FISH.

TO THE EDITOR OF SCIENCE: The notice by Mr. Barton A. Bean of "a rare 'whale-shark'" (SCIENCE, February 28, p. 353) is the first record of the *Rhinodon typicus* as a western Atlantic fish, but the species or an allied one has been several times noticed as a visitor to the Pacific coast of America. Mr. Bean has duly referred to my description of *Micristodus punctatus* in 1865. When I published that

article I had serious misgivings lest the species would prove eventually to be congeneric with *Rhinodon typicus*, but the positive ascription to that form of simply conic teeth by such eminent authorities as Müller, Henle and others restrained me from identifying the California shark with it, and consequently I described the American form as the representative of a new genus and species. A comparison of the teeth of the California species with those of the Caribbean animal has led me now to consider them to be at least congeneric. The later notices of the dentition of individuals undoubtedly belonging to *Rhinodon* force on me also the conviction that all the selachians of like appearance are congeneric.

Mr. Bean, whom I had told that there was a considerable literature on *Rhinodon*, informs me that he has gone through the zoological and other records without finding any references other than the early one to *Rhinodon*. This absence of data is a striking illustration of how unsafe it is to conclude that because no references are found in the zoological records, no literature exists, and I now enumerate such articles as I happen to know about in which *Rhinodon* is mentioned.

Neglecting the general works in which *Rhinodon* (or *Rhineodon*) *typicus* has been described, we pass at once to the comparatively late notices.

In 1870 Professor E. Perceval Wright noticed its occurrence about the Seychelles Islands in a letter published in the 'Spicelegia Biologica' printed in Dublin. This I have not been able to consult as it is not in the libraries of Washington or Philadelphia.

According to Dr. Christian Lütken, however, Wright (p. 65) claimed that 'this shark, which is—the north whale excepted—the largest of living animals, * * * contrary to the general habits of the true sharks, is not a carnivorous but a herbivorous fish.'

In 1873, Dr. Lütken compared it with the basking shark, called by him *Selachus maximus*, in an article on the latter species in the 'Oversigt over det K. Danske Videnskabernes Selskab Forhandlinger * * * i Aaret' 1873 (pp. 47-66, pl. 2; résumé, pp. 8-10). A brief

notice also appears in the 'Videnskabelige Meddelelser fra den naturhistoriske Forening i Kjöbenhavn,' for Aaret 1873 ('Oversigt,' p. 11). Dr. Lütken denies that the shark is herbivorous and maintains that it feeds on minute animals.

In 1874 Professor Wright described a crustacean parasite of the *Rhinodon* (*Stasiotes rhinodontis*) in an article 'On a New Genus and Species belonging to the Family Pandarina' in the *Proceedings of the Irish Academy* (pp. 583-585).

In 1876 Professor Wright incidentally treats of the *Rhinodon* in an article on 'The Basking Shark' in *Nature* (XIV., pp. 313, 314). He says "When engaged at the spermwhale fishery off St. Denis the fishermen often told me they dreaded to harpoon by mistake a *Rhinodon*. A whale must come up to breath or else choke itself. But there were stories told me of how a harpooned *Rhinodon*, having by a lightning-like dive exhausted the supply of rope, which had been accidentally fastened to the boat, dived deeper still, and so pulled pirogue and crew to the bottom—there, in spite of the harpoon in its neck and its attendant incumbrances, it was at home for a great length of time." (One would like to know the length of the rope and the depth of descent.)

In 1878, Professor W. Nation 'examined * * * a specimen captured at Callao. Of this specimen' the British Museum is said to possess "a portion of the dental plate. The teeth differ in no respect from those of the Seychelles chagrin [*Rhinodon typicus*]; they are conical, sharply pointed, recurved, with the base of attachment swollen." This notice is by Albert Günther in *Nature* (XXX., p. 365) and contains the first detailed account of the teeth, which had been previously described as simply conic.

In 1879, Professor Wright especially noticed the *Rhinodon* in his 'Animal Life.' (This work is not dated, a fault of the publishers, but it appears from the 'English Catalogue of Books' that it was published in 1879.) He repeats the information already given by him and postulates that the shark 'would appear to have a very limited geographical distribution.' If the animals else-

where found are conspecific with it, however, the possible range is large.

In 1883, Mr. A. Haly, director of the Colombo Museum, records the 'Occurrence' of *Rhinodon typicus* Smith on the west coast of Ceylon' in the *Annals and Magazine of Natural History* (5th ser., XII., pp. 48, 49). The specimen—a female—was 23 feet 9 inches long.

In 1884, Signor G. Chierchia, in a brief notice of the 'The Voyage of the Vettor Pisani,' an Italian corvette, in *Nature* (XXX., p. 365), alludes to a gigantic shark caught in the Gulf of Panama. The shark was called *Tintoreva* by the natives and the specimen was 8.90 meters (nearly thirty feet) long. Albert Günther adds a note identifying it with the *Rhinodon typicus* and expresses the opinion that the *Micristodus punctatus* is of the same species.

In 1884 Mr. Edgar Thurston, superintendent of the Madras Government Museum, records the capture of several specimens of *Rhinodon*; one '22 feet in length' which had been 'cast on shore at Madras in February, 1889,' and another '14 feet 6 inches in length was caught off Bambalapitiya (Ceylon)' in April, 1890. A photograph of the Madras specimen is reproduced in 'Bulletin No. 1' of the Madras Museum (Pl. III. A). A description is also interjected in a section of the report (pp. 36-38) on the 'Inspection of Ceylon Pearl Banks.'

In 1901 Kamakichi Kishinouye, of the Imperial Fisheries Bureau at Tokyo, published a notice of 'A Rare Shark, *Rhinodon pentalineatus* n. sp.,' in the *Zoologischer Anzeiger* for 1901 (XXIV., pp. 694, 695). It is not obvious how the species differs from *R. typicus*.

The question of specific differences (if any) within the genus must be reserved for a future occasion. Differences in the number of teeth and coloration may be of specific value.

Mr. Bean remarked that a specimen 'taken at the Seychelles Islands, is known from the teeth only' in the British Museum. That Museum has the fish itself, about 17 feet long, mounted by Gerrard. The only Museum speci-

men he knew of was the type in the Museum of the Jardin des Plantes. Besides that and the one in the British Museum, there are at least mounted specimens in the Ceylon Government Museum and the Madras Government Museum as well as, now, in the United States National Museum. The typical species is common about the Seychelles Islands. Dr. Bashford Dean informs me that it was also noticed during the voyage of the *Siboga*.

It is greatly to be deplored that the opportunity to obtain the skeleton and some of the soft parts of the Florida shark was not utilized for the National Museum. A rare opportunity was afforded by the waif of the Florida shore which is not likely to be repeated for a long time.

It may be added that *Rhineodon* was the first name applied to the genus and that possibly the American fishes may be specifically distinct from the type and entitled to the name *Rhineodon punctatus*.

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WASHINGTON, April 28, 1902.

A METEORIC IRON.

A METEORIC iron which weighed a little less than nine pounds, and which as respects its shape and its surface markings seems to be almost unique, has recently come into the possession of the University of Wisconsin. The fall of this iron was not observed, but it was turned up by a plow in 1887 on a farm near Algoma post office, Kewaunee county, Wisconsin. Since that time and until March of the present year it had remained about the farm upon which it was brought to the light.

Instead of the usual lumpy form, this find has the shape of an elliptical shield, the major axis of which is about ten inches, the minor axis six inches, and the maximum (central) thickness about an inch. The smoothness and density of the convex surface is in sharp contrast with the irregularities and the crust of oxide upon the concave side. There is no reason to doubt that the projectile moved broadside on with the convex surface (Brustseite) to the

front during its translation through the atmosphere. Upon this surface strongly marked radial lines are arranged like the rays of a solar plexus about a central, nearly flat elliptical boss some inches in diameter, and these lines increase steadily in depth as they approach the periphery. The Widmannstätten figures show no trace of deformation. Shortly after this find began to be studied by the writer a copy of Professor Cohen's paper on the flat meteoric iron from N'Goureyima in the Soudan (Griefswald, 1902) came into his hands. The two meteorites are in many respects similar, though the Algoma iron has the greater symmetry and much more perfect surface markings. It will shortly be more fully described.

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THE GEOLOGICAL SOCIETY OF AMERICA.

THE fourteenth summer meeting of the Society will be held in Pittsburgh on Tuesday, July 1, in the room assigned to Section E, American Association for the Advancement of Science. The place now designated is the lecture room of the Oakland M. E. Church, very near the hotel headquarters. The Council will meet on Monday evening at the hotel. The Society will be called to order by the president, Professor N. H. Winchell, on Tuesday morning immediately following the general session of the Association.

The preliminary list of papers will be mailed about June 7. The Fellows are requested to send their titles and abstracts of papers upon the printed form as early as possible, and not later than June 3. By rule of the Council abstracts are required. Papers offered for printing in the *Bulletin* should be fully described on the blank forms, copies of which will be promptly sent on request.

The circular sent to the Fellows March 11, announced an excursion, under the guidance of Dr. I. C. White, through the Coal Measures of western Pennsylvania and northern West Virginia during the week preceding the Association meeting. The party will assemble at the Monongahela House on Monday evening, June 23. This hotel will be headquarters during the week of the excursion; the rate will be