THE condition of the Rockefeller Foundation's offer of $6,000,000 for the construction of a model faculty of medicine in Paris was that a similar sum should be raised in France. It is said that there was every prospect until a few months ago that the necessary contribution would be forthcoming from the French Government in the form of a credit allocated under the national equipment plan voted by Parliament. No such provision was made, however, for the reason that agreement had not been reached on the question of where the proposed laboratory and other new buildings should be constructed.

DISCUSSION

THE FIFTH FLORIDA WHALE SHARK—1932

SINCE the capture of the fourth whale shark at Marathon, Florida, in June, 1923, reports have been coming in of others seen in the Keys and in the Gulf Stream between Miami and the Bahamas. However, all efforts to get definite information about these have been in vain. Recently an 18-foot specimen was taken off Miami and the facts have been gathered to make a new faunal record, the fifth for Florida waters and the seventh for that general locality—the Straits of Florida.

The first news of this fish that reached the American Museum was a telegram which simply read: "Huge shark captured here. Do you want it?" From my personal knowledge of Florida sharks, I judged this shark to be first a great hammerhead (*Sphyrna zygaena*), secondly a huge tiger (*Galeocerdo tigrinus*) and lastly and most improbably a whale shark. Hence I was not very much excited, and when the identity of the shark was ascertained twenty-four hours had passed and it was too late to do anything. However, as will be seen the skin has been preserved and will be mounted.[1]

On January 18, 1932, Captain Thomas Gifford took a party of anglers in his boat out in the Gulf Stream off Miami for a day's fishing. About 2 P. M., while about 30 miles south of the entrance to Miami Harbor, the mate, James O'Neil, saw a large fish, and the vessel's course was set to intersect that of the shark. When the huge fish crossed the vessel's bow it was thought from its color to be a huge leopard or tiger shark (*Galeocerdo tigrinus*). But when Captain Gifford went out to the harpooning "pulpit" on the bowsprit he saw that it was a whale shark (*Rhineodon typus*) with which he and other Florida sailors are somewhat acquainted by reason of various captures of late years in the Florida Keys.

In the excitement over its great size (great in comparison with that of other Florida sharks) and the unusual coloring (vertical yellowish bars separating vertical rows of large yellowish spots), the first throw went wild. The second, however, struck the whale shark in its most vulnerable part—the gill region. The harpoon—one used for striking sailfish—though bent, held, and the fish towed the boat a considerable distance out into the Gulf Stream. Presently, however, it began to weaken from loss of blood and to work toward shore. As it grew weaker, it was drawn up to the boat, lashed fast, and with much resistance was towed into the yacht basin at Miami. Later by means of block and tackle it was swung up clear of the water and photographs were made of it hanging clear.

The fish was harpooned in water about 25 feet deep in the edge of the Gulf Stream, but the capture was made near Beacon O, between Cape Florida and Sand Key, in water between five and ten feet deep. Like other Florida specimens this fish put up no fight other than to tow the boat around in trying to escape. Being of relatively smaller size (18 feet over all) and because of loss of blood by reason of being harpooned in the gills, it offered less resistance than larger specimens harpooned in the back, and was lashed to the boat for towing after about three hours' effort to escape. Three hours more were required to tow it into the yacht basin at Miami, some 25 miles distant.

Mr. Pflueger made a plaster cast of the fish while it was fresh and secured the skin. As noted there were excellent photographs made of the fish swung up by the tail. With the help of these things Mr. Pflueger plans to mount the skin in fashion as near to nature as possible.

The length is variously given as 17 feet, 8 inches, to 18 feet, 6 inches. Various estimates have been made of the weight of the fish, the liver and the heart; but, as they are all merely estimates, they will be disregarded. Mr. Pflueger opened the stomach but found therein nothing but seaweed and a great quantity of partly digested and hence unrecognizable food material.

This is the fifth Florida whale shark and the seventh for this general region—the Straits of Florida. The first specimen (18 feet long) came ashore on Ormond Beach on January 25, 1902. The second (32 feet long) was taken near Knight's Key in May, 1912.

[1] For the information and for photographs of the fish on which this note is based I am indebted to my friends, Commodore R. M. Munroe of Cocoanut Grove and Mr. John Mills of Miami, and to Mr. Albert Pflueger taxidermist and naturalist of Miami.

The third was 31 feet over all and was captured in the Bay of Florida in June, 1919. The fourth (31.5 feet in length) was harpooned at Marathon in June, 1923. This, the fifth specimen, was taken on January 18, 1932. In addition, two specimens have been captured off Havana Harbor. The first (32 feet long) was taken west of the mouth of the harbor in 1927; the second (about 34 feet in length) was caught east of the harbor mouth in March, 1930. All these fish, save the first, I have put on record but only after the receipt of photographic evidence. Such data have come for this specimen, and since one photograph is the best ever made, I hope later to publish it and others and thus make them available for the use of ichthyologists.

These seven captures in the region of the Straits of Florida indicate that there is a breeding ground somewhere to the southwest from which the fish drift northeast with the Gulf Stream. From various data coming to me over a period of years, I am convinced that this is somewhere in the Yucatan region. The reasons for this are set out in a recent paper of mine,[2] to which the attention of those interested in this particular matter is called.

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THE WHALE SHARK ON THE COAST OF BORNEO

DARVEL BAY is a large indentation on the northeast coast of British North Borneo. In the jungles behind its flat sandy shore live deer, wild boar, tambadu or huge wild ox, elephant and rhinoceros.

Last summer I discovered that the waters of the bay held monsters even greater than anything on its shores. As the Philippine revenue cutter, *Mindoro*, entered Darvel Bay from the Sulu Sea on August 4, 1931, my friend, the Spanish engineer of the boat, spoke to me of the great "chacon" and its mate which were always seen whenever the *Mindoro* passed that way. To my surprise, while we were talking about it a great whale shark broke water and swam about on the surface, perhaps a little more than two hundred yards away. It was a typical specimen of *Rhineodon typus*, the white spots and longitudinal ridges being more distinct than I had ever seen them before. We estimated the length of the "chacon" to be between 12 and 15 meters.

Our boat was running parallel with the flat sandy coast, and we soon left the great shark behind, as it was merely circling about. Perhaps a quarter of a mile further on another whale shark broke water but did not emerge sufficiently to show its spots. Only its gigantic size, equal to that of the one seen first, told what it was.

The *Mindoro* frequents these waters during several months each year, while watching for smugglers, and anchors not far from the place where we saw the sharks. The engineer told me that he had seen these two sharks almost every time the ship had passed the point during the past fifteen years.

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DETERMINISM AND THE WEATHER

IN commenting on Professor Compton's[1] remarks on the uncertainty principle and free will, Professor Noyes[2] has contributed to clarity of thought and discussion by pointing out the important distinction between events which are indeterminable and those which are indeterminate. The illustration he has chosen, however, seems to imply a view of causation which calls for a certain amount of comment. He says: "I think no scientific man would claim that because the weather is indeterminable it is indeterminate—that the weather to-morrow will not depend, inevitably, on conditions which exist to-day." On the contrary—be it said for whatever measure of philosophic comfort weather forecasters may derive therefrom—I think that a considerable number of scientific men would decline to commit themselves to any such statement, for excellent reasons which Hume pointed out nearly two centuries ago. Sequence of events, however oft repeated, affords no proof of causal connection. The best that can be said, from the strictly critical standpoint, is that the weather to-day is related to the weather to-morrow through a chain of intermediate unknown events which, if we were able to find them out, we should be likely to naïvely regard as establishing a causal connection.

If it be objected that this strikes at the root of all scientific method, it may reasonably be replied that the scientist should himself be the most eager to examine critically the bases of his own procedure. Such an examination is inevitable when the boundary between physical science and metaphysics becomes as indefinite as it is at the present time.

It may be admitted that there are excellent pragmatic reasons for assuming a causal connection between events or series of events characterized by a high degree of statistical correlation (the relation of the weather on two successive days is not the best example of this!), but it should be pointed out that this assumption does not justify the ordinary idea

[2] E. W. Gudger, "The Fourth Florida Whale Shark, *Rhineodon typus*, and the American Museum Model Based on It." *Bulletin American Museum of Natural History*, 61: 630–632, 1931.

[1] A. H. Compton, SCIENCE, 74: 172, 1931.
[2] W. A. Noyes, SCIENCE, 74: 595, 1931.