



## A Shark Encircled with a Rubber Automobile Tire

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repeatedly by workers. Indeed in our collection of materials we have slides showing these. It is true also that the researches of Van Beust and others indicate channels of a sort within enamel itself. Nevertheless, the lumina of these passages is so small that one can not conceive that a cell of any sort may pass through them. Circulation if it exists at all can include at most merely the slow passage of an extremely small amount of fluid entirely without cell contact. Even this degree is by no means an assured fact. In light of these considerations, it seems very likely that there can be no immunity in the usually defined sense of this term of a host towards dental caries. Resistance has been demonstrated, but that is not immunity.

In this discussion, then, it has been our endeavor to show that it is probable that there is a bacterial etiological factor in dental caries. No claim is entered that this is the sole factor, but we have attempted to prove that organisms which may be cultivated nearly always from a carious lesion, may in turn induce the result. A certain degree of hydrogen

ion concentration is necessary in order to break down human teeth by solution. These organisms produce this appropriate degree of hydrogen potential. Likewise they can dissolve the calcareous structure of dead teeth. The metabolism of these forms is in large degree dependent upon decomposing food materials found about the teeth. In addition dental caries includes more than the mere solution of dental calcareous material since an organic matrix in enamel is liquefied also. These organisms are not identical in all respects to other groups found within the intestine since the final degree of acidity produced is not the same in the two series. A commensal relationship between two different groups of bacteria appears to function within the mouth since one series may furnish anchorage for another.

These caries-inducing bacteria do not show constant cultural reactions particularly as regards their effects when in contact with certain carbohydrates. Neither do they show immunological types. The probabilities of true immunity in dental caries seem to be remote.

## A SHARK ENCIRCLED WITH A RUBBER AUTOMOBILE TIRE

By Dr. E. W. GUDGER

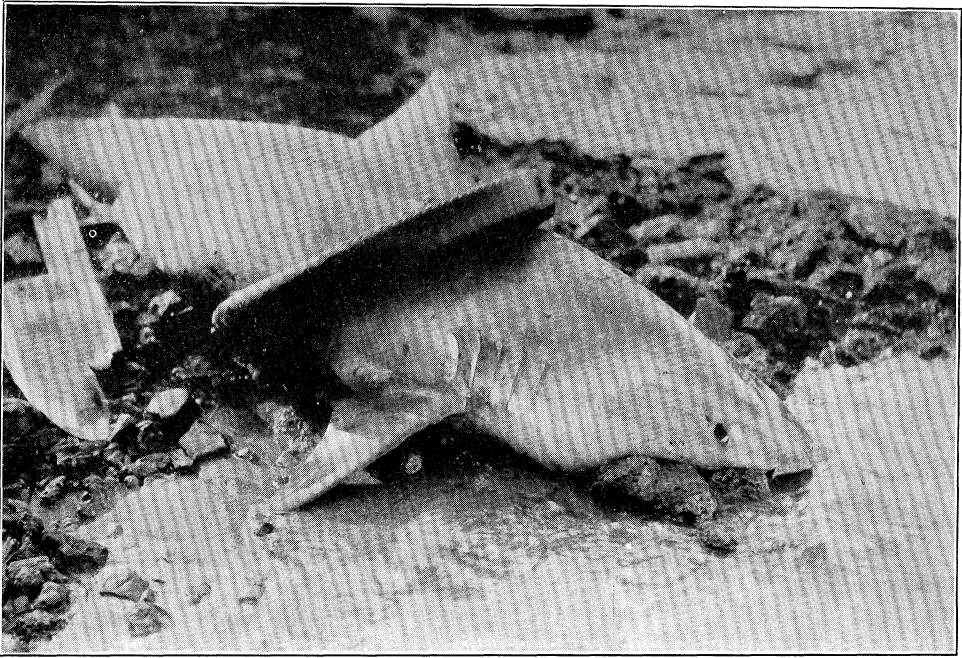
AMERICAN MUSEUM OF NATURAL HISTORY

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THE senior author has already published two articles (*American Museum Novitates*, 1928, No. 310; and *Annals and Magazine of Natural History*, 1929, ser. 10, vol. 4) describing mackerel and other fishes with rubber bands encircling and even partly imbedded in their bodies, and has on hand six other specimens showing this phenomenon in more exaggerated form. What then

could be more logical than for the junior author to send him a clipping from the rotogravure section of the *Diario de la Marina*, of Habana, Cuba, for Sunday, September 21 last, containing a reproduction of the picture which is included in this article. Above the picture was a short caption and below an interesting account of the phenomenon. A translation follows herewith.



—Photograph by courtesy of *Diario de la Marina*, Habana.  
THE SHARK, ENCIRCLED BY A RUBBER AUTOMOBILE TIRE, ON THE SHORE OF COJIMAR BAY, EAST OF HABANA HARBOR.

#### THE LAST CONTRIBUTION OF A RUBBER TIRE

In the vicinity of the coast opposite Habana, where fishermen are navigating their small boats daily, two fishermen, when outward bound as usual, recently saw an enormous shark which was making a great disturbance at the surface of the water. It was unable to swim and apparently remained stationary as if moored by an anchor at the bottom of the sea. The fishermen, actuated by curiosity and the desire to make a good catch, decided to approach the fish. When they did so they were surprised to see that it was a shark of the "Alekrin" kind about five meters long which had been caught by a rubber tire . . . which the owner had thrown into the sea, having decided to replace it by another.

This shark, one of the most voracious of its kind, seeing the circle of the rubber tire, had thrust its head into its center and there remained trapped in the manner in which we see it in the photograph. This placed it in a position to be easily captured thanks to the rubber tire. This latter, after having for many years rendered its service to an automobile, nevertheless cheers us with a last contri-

bution—the deliverance from one of these terrible sharks.

A letter to the director of the *Diario de la Marina* brought a copy of the photograph and a very courteous reply from Señor Gonzalo Menéndez, the managing editor, expressing his regrets that he could give us no further information than that contained in the note above set out. Inspection of the figure showed the shark in question to be a male of a non-determinable species.

Information has been hard to obtain, but the persistence of the junior author has finally produced some data. Our first efforts were to ascertain if the fish swam into the tire or if it was caught and the tire put on it by human hands. Our earliest information was that the fish when seen by the fishermen as noted above was literally "alive and kicking" but unable to move save at a snail's pace. It was in the bay of Cojimar, off

a small fishing village about five miles to the east of the mouth of Habana Harbor—from which place we have recently put on record the capture of a second whale shark from Habana waters.

Our next information came from a gentleman who saw the fish alive but who described it as very weak, almost dead. This exhaustion was undoubtedly in part due to the efforts it had made to swim in spite of this great hindrance, and in even greater degree because it had practically been unable to catch any food since it became encumbered with this tire.

Finally Dr. Hoffmann himself made a trip to Cojimar and there found the fisherman who gave us our most reliable information about the second whale shark. He also saw and talked with the two boys who actually caught the shark. All three of them saw the fish swimming along and trying to jump out of the water in its efforts to free itself of the incumbrance. But these only drove the tire further back until it had come to encircle the body of the shark just in front of the first dorsal fin. One man said that the tire was so tight on the fish that one could see the ring it had made in the skin and flesh, and that the only way to get the tire off was to cut the shark to pieces—as was done. This, if correct, would indicate that the tire had been on the fish for some time.

The shark was actually caught by two boys who cautiously approached it as it was floundering along on the surface of Cojimar Bay. When they saw that it was practically helpless they approached

nearer and getting a lasso over its head brought it to shore where they killed it after it had been photographed.

Now the final question is how did the tire come to encircle the shark as is shown in the photograph? And at once we may dismiss the idea that it was placed there by the hand of man. No sane man is going to attempt to put an automobile casing over the head of a large vigorous savage shark and to drive it back clear of the pectoral fins. We believe that the explanation is to be found in the following facts, which agree in essence with those offered by Dr. Gudger to explain how his specimens of northern fishes came to be adorned with rubber bands.

As in New York, so in Habana, garbage, street cleanings, wastes of all kinds are collected, loaded on scows or barges, and these are towed out to sea and their loads dumped overboard. Sharks are scavengers and they attend these scows to their unloading grounds to feed on garbage. When this with the worn automobile tire and other like débris was dumped overboard, our shark dashed into it to pick up what he could to ease his hunger. The open ring of the automobile tire confronted him with something edible beyond. Laying his pectoral fins close against his sides, he drove through to find himself stopped when his non-bendable dorsal fin struck the rim. Finding himself caught he became panic-stricken and pushed against obstacles to sweep this clinging thing free from his body—with the results that we have seen.