

Toothless, sluggish—and ultra-dangerous; two full-grown electric eels basking in their tank at the New York Aquarium.

New York Aquarium; Duntou Photo.

They Hope to SOLVE the RIDDLE of the ELECTRIC EEL

By Thomas M. Johnson

AN expedition has just sailed for South America, on a new quest after the secret of human life. It is an expedition not of Conquistadores but of scientists who hope to solve, with novel apparatus, the riddle of that strange creature, the electric eel.

How can its sluggish, eight-foot body shoot forth an electric current that will light a light, paralyze fishes or knock over a horse?

The answer may startle the world by solving a greater riddle: How does the human body generate a similar electric current and send it along the nerves? Modern medicine does not know, so the answer is being sought in the waters of the Amazon river.

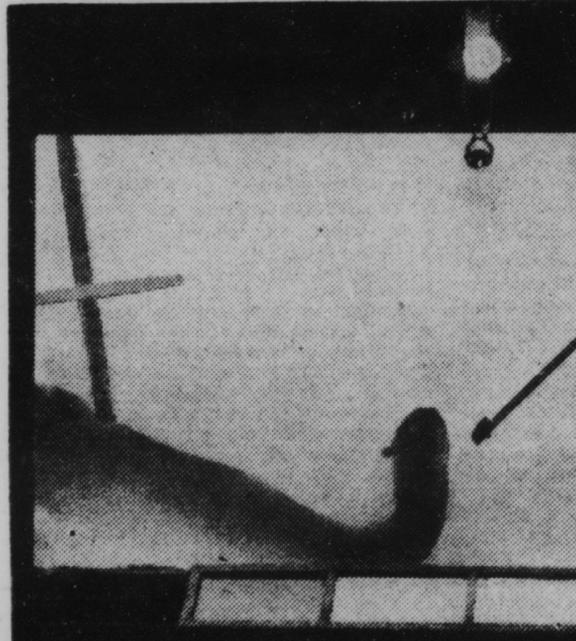
There the explorer-scientists will risk electrocution by the astonishing river monsters, while investigating their strange power by means of new inventions, also electrically operated. They will signal to the eels with an "eel caller," and listen to the eels' signals through telephones.

Incredible, but true, experiments along these lines have already been made at the New York Aquarium by Christopher W. Coates, authority on tropical fish; Prof. Richard T. Cox of the physics department of New York University, and Robert S. Mathews of Columbia University and the American Museum of Natural History. Professor Cox and Mr. Mathews left Feb. 1 for Brazil, enthusiastic over the prospect of significant new discoveries about this living submarine storage battery.

What an interesting creature is *Electrophorus electricus*! He draws more sightseers than any denizen of the deep in the Aquarium. When a fish is thrown into the tank, the great eel comes to life. A convulsive movement shudders along his body; his tail lashes. Then he darts forward. In the pink mouth gaping in his blunt brown head, he seizes the fish—which he has electrocuted by the electric current he has sent through the water. Then, slowly, the eel swallows the fish whole.

WERE he in his native Amazon, he would shock insensible a whole shoal of fish, then as they floated, bellies up, he would pick out the choicest morsels one by one. After he had wolfed down the last, the survivors would come to life and swim away.

Impossible? So said some New Yorkers until they had stood before the Aquarium tank and seen the eel light an electric light! It is a two-watt bulb, and it takes 85 volts to light it. Yet thousands of Aquarium visitors from New York and everywhere in the



Listening in on the eel's "conversation" (above) with a T-bar and headphones.

Stirred to action by a rubber-tipped stick, the eel (left) lights a two-watt bulb. (Photo copyright, Pathe News, Inc.)

country have seen it flicker on and off, in response to the powerful discharges of the electric eel.

A creature of infinite variety, as Mr. Coates has demonstrated by becoming more intimately acquainted with *Electrophorus electricus*, probably, than any American.

With a long hook in one hand, Mr. Coates guides the eel toward him. With the other hand, he reaches down and lifts him from the water. The long brown body scarcely wriggles, which is just as well, though the hook is rubber covered and so are Mr. Coates' hands, with gauntleted gloves.

"One big one shot me eight feet into the air, and knocked me cold," says Mr. Coates. "You can't fool with these babies, even if they are pretty tame."

Carefully he lowers this particular "baby" onto the "eel cradle." This device of his is a piece of hard rubber pipe, halved to make a small trough. Its bottom is ringed with tin bands at intervals that are marked in centimeters. At one end of the cradle is placed the eel's head—and then begins an odd performance.

Gently and carefully, but unmistakably, Mr. Coates shampoos the eel. With his rubber-gauntleted hand, he rubs its glistening head, until into even that slow brain penetrates the idea that something is going on that is so unusual as to call for an electric discharge.

The eel thrashes. By some process not yet fully understood, the current

passes out from his body.

It shoots through the tin bands to wires that are plugged in from a black, box-like apparatus somewhat like a camera, on whose face appears a translucent white dial. And suddenly across that dial dance tiny light green lines, weaving graceful, skipping patterns. They are made by the electric current from the eel, distributed through the switchboard of the eel cradle.

THE cradle is divided into sections and marked off in centimeters, to show whence comes this mysterious "juice"; from what part of the eel's body lying on the cradle.

There is an eel telephone, too. This interesting apparatus is a T-bar of glass tubing, 1½ feet long. At the extremities of the top bar are copper electrodes. Wires run through the tubing, and there are headphones. With these clamped over his ears, whoever dips the T-bar into eel-infested water can hear sharply an intermittent but distinct crackling sound—the eels' electrical discharges.

Dr. Cox may not only listen to the eels on the marshes of the lower Amazon; he may talk to them—also by telephone.

He will use an "eel caller" or "artificial eel" that Mr. Coates has also tried out in the Aquarium. It is an electrical apparatus that can discharge 500 volts in a thousandth of a second, almost exactly as the eel discharges. And when, through connecting wires, it

signals into the water, will the eel "talk back"?

Can it be that eels signal to one another under water? Are they not only living submarine power plants and death rays, but wireless plants as well? Dr. Cox and Mr. Coates have found hints of it in their studies of captive eels in tanks. Now they want to see how "wild" eels act.

How does the eel shoot forth this current that stuns fishes and knocks about able-bodied men, without shocking his own kind, too? Or indeed, without electrocuting himself? And just how does he generate such a current? The amazing answer is: "With his muscles!"

The *Electrophorus electricus* is one of the most muscular of creatures. Five-sixths of his six or eight feet are muscles. These muscles are among the miracles of science. They include special electrical organs that are in three pairs; a veritable living bank of dry batteries, within a flickering tail.

Like dry batteries, they store chemicals that produce electricity. By some mysterious means they can discharge that electricity at will. An eel's power may be measured in hundreds of volts—perhaps 300.

A human being is electrically powered, too, with the same sort of electricity as the eel, which is just the sort that lights our lights and rings our bells and runs our radios; but the human being's electric power can be measured only in thousandths of a volt.