

FISH TALK

SPINY LOBSTERS are like men insofar as their voices become deeper as they grow older.

This is one of the findings of Dr. James M. Moulton of Bowdoin College, Brunswick, Me. He spent the last summer at the Bermuda Biological Station eavesdropping on the conversations of undersea life.

In countless other marine biology stations and research laboratories throughout the world other researchers like Dr. Moulton are studying the various aspects of the oceans.

Their aim is twofold:

1. They hope to unravel some of the mysteries of what many scientists believe is the "last frontier"—the oceans.

2. They hope that their studies will one day provide mankind with limitless harvests that will feed an expanded population that the land will no longer be able to sustain.

ALTHOUGH THE SEA has been an integral part of mankind's history, little is actually known about the sea itself, and less about the life beneath its surface.

It is relatively recently that man has turned to the sea in an intensive effort to probe its secrets and map its nature. One of these secrets, the one Dr. Moulton is probing, is the "talk" of fish.

Historically, savants have, in passing, made note of the fact that beneath the surface of the sea there are fishy "conversations" taking place.

Aristotle compared the voices of fish with those of land animals. Capt. John Smith, when he was Governor of Bermuda in the early seventeenth century, noted that the grouper made a sound that earned the fish its name. And, William Penn chronicled the sounds of the drum fish as early as 1685.

But it was not until World War II that undersea noises made by whales, lobsters, shrimp and fish earned more than passing interest. Up to this point, man had pretty much relied on a tool that was not well adapted to hearing under water—his ear. The advanced technology gave him a new tool—electronic gear that could detect the screws of an enemy's

propeller or the echo from a submarine's hull.

AS OFTEN HAPPENS, the new tool carried along with it new problems. Submarines of both the Allied and the Axis fleets were plagued with reports of enemy craft in the vicinity, only to learn that there were no craft. Research since has implicated a host of undersea life as the culprits in the deadly game of ferreting out enemies while blinded beneath tons of water. The problem still exists.

The sounds emitted by fish and other marine animals plagued landlubbers too. The harbor defense forces in Chesapeake Bay, for example, were being alerted frequently until it was learned that they were responding to the calling of thousands of drums or croakers moving into the bay each spring to breed.

And it was found that a single call of a common toadfish was intense enough to trigger an acoustical mine that was meant to be tripped by the sound of a passing ship.

Dr. Moulton is interested in these more practical problems of undersea talk because he is interested in all its aspects. But his primary work is basic research. He wants to learn why crustacea and undersea mam-

mals and fish talk. What effect does the fish talk have on the behavior of other fish? How do they talk? How do they listen?

DR. MOULTON'S RESEARCH along the Atlantic Coast from Maine to Bermuda, together with that of other investigators, is now beginning to nibble away at the mysterious bait of fish talk.

For example, Dr. Moulton explains, not all fish talk as much as others. Curiously, it is found, sound production is more widespread among salt water fishes than fresh water fishes.

Similarly, another scientific enigma is the fact that fishes living in clear, warm seas such as those around Bermuda seem to have evolved a greater variety of sound-producing mechanisms than have fishes in Dr. Moulton's home territory of cold northern waters.

What does the talk sound like? Jacks and grunts, which produce sound by rubbing teeth or other skeletal parts of their body together, sound like the "noisy eating of celery," Dr. Moulton says.

"The toothplate rubbing of puffers and porcupine fishes produces a sound similar to that of a klaxon horn."

The tiny snapping shrimp, one to three inches long, literally snaps a single over-sized

claw. Together, several of the small shrimp sound like "fat frying."

The spiny lobster makes two sounds: a rasp when it is disturbed or injured; and a "rattle" during the daytime only, when it is unperturbed. At night, the lobster is quiet, although more active.

Why undersea creatures talk is a mystery. Dr. Moulton, and others, have speculated heavily and their theories run from sound produced for defensive purposes to mating calls. All or none may be true.

Sea robins, Dr. Moulton points out, have been shown to respond to imitations of their staccato calls played back to them underwater. Male gobies, some drums and cods all develop a call during the breeding season which, when played into the water, stir females in captivity.

SQUIREL FISH and grouper of the Great Bahama Bank, Dr. Moulton says, "bark at an approaching hydrophone much the same as a dog will bark at an approaching automobile."

"The black angelfish of the same waters incorporates a whining call into recognition behavior toward an approaching member of the same species," he says.

Other fish grunt at signs of danger. Still others moan when protecting their nests. The list of sounds and reasons for them almost as inexhaustible as numbers of fish in the oceans.

Dr. Moulton believes from his own work and that of others that "many fishes create sounds as integral parts of their normal behavior patterns and it is probable that at least in many instances the sounds may serve to facilitate breeding."

This aspect of fish talk may prove to be a key to harvesting the seas to feed future generations.

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