

Living Fossil Is Coming Ashore



—SY BARLOWE—

It's mating season for the horseshoe crab

By JONATHAN COHEN

TONIGHT, as the full moon rises, instinct will stir hundreds upon hundreds of horseshoe crabs to come ashore on Long Island beaches and lay their eggs. These living fossils mate once a year — during the moon tides, or highest tides, in June.

The horseshoe crab is one of the most successful creatures on the face of the earth. Its lineage goes back 300 million years, and it has changed little since the days of the dinosaurs. Actually, the horseshoe crab is not a true crab at all; rather, it is a "sea scorpion" whose closest living relatives are the arachnids — the spiders and scorpions.

When horseshoe crabs swarm ashore, it is at night and only for a period lasting a few days. The female crab, which may be up to two feet long, is quickly followed by the smaller male. Sometimes a train of three or four males attach themselves to one large female, partly propelled by her, awaiting the moment she lays her eggs in a nest of sand.

Each female lays 200 to 300 green eggs, which hatch in about two weeks. Then the young crabs, small but fully formed, head for deep water.

A young crab molts seven times in its

first year. The front rim of the shell splits, and the crab crawls out, leaving behind a complete shell. It soon grows a new one. In about three years, after a total of 14 molts, the crab has become an adult. It lives from 10 to 20 years.

An unusual feature of the molting process is the shedding of the six eye lenses and the subsequent regrowth of new ones. The horseshoe crab's scientific name, *Limulus polythemus*, comes from the location of these eyes. Two compound eyes, made up of 10 or 15 eye cells like those of an insect, are on the side (*Limulus* from the Latin *limus*, meaning sideward glancing). Two simple eyes are in the front (*polythemus* from the name of the Cyclops of Greek mythology who had one eye in the middle of his forehead). Two more eyes, on the underside, quit functioning when the crab reaches maturity.

For many years the horseshoe crab was considered a nuisance that destroyed some shellfish. But now the tide seems to be turning, and people have become concerned with conservation of this creature.

Today, the horseshoe crab is widely used in biological research. In the 1930's scientists began studying it, and the research has intensified in the last 10 years.

In 1967, an American biophysicist, Dr. Haldan Keffer Hartline, shared the Nobel Prize in Physiology or Medicine

with two others for research on the visual processes of the human eye. Much of Dr. Hartline's most important work in this area was based on his studies of the eye of the horseshoe crab.

Now physicists are engaged in studying the horseshoe crab because its compound eye is regarded as the most perfect light-gathering design found in nature. This rare property of the ancient animal's eye may yet be of use in designing solar energy-producing devices.

Last October, the first international symposium on the biomedical uses of the horseshoe crab was held at Woods Hole on Cape Cod. The unique pale-blue blood of the crab provides an extract that is used in medicine to detect poisonous bacteria.

It also provides natural blood proteins used in major cancer research to study human blood cells. Consequently, scientists also talked of plans for rearing horseshoe crabs in captivity.

At Adelphi University, Harry Brenowitz hatches the crabs from eggs in a laboratory and uses the young for his research. Other studies of the crab are conducted on the island, too.

Many horseshoe crabs are found in the Great South Bay and Long Island Sound, where they scavenge for dead fish, sea worms, clams and whatever else they can find on the bottom. This helps keep the water clean.

Horseshoe crabs are harmless creatures. They don't attack with their barbed tail spikes, which are used mainly to right themselves when knocked over by waves. If a crab is buried in the sand in shallow water, however, its tail spikes may be sticking up, so people should step carefully.

In the past, Indians on the island used the tail spikes to make fishing spears. They also ate the eggs and what little meat they could find inside the crab's shell. Early settlers used the crab — which they called the "horse foot," a more accurate name since it looks like a horse's hoof rather than a U-shaped horseshoe — as feed for pigs and chickens. Today horseshoe crabs are still eaten by some people.

Occasionally they are used as bait in eel and lobster pots or as bait to catch the killifish that South Shore fishermen use to bait the summer flounder.

To watch the crabs swarming ashore, it's best to go out on nights with a full moon. They can be found at just about any Long Island beach, especially around the lee shore of bays and inlets. ■

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