

## CONCHOLOGY

# Inland Sea Shells

**Fossil shells found far from ocean or even high in the mountains tell of life in seas hundreds of millions of years ago.**

By **MARTHA G. MORROW**

► SEA SHELLS found far inland or high in the mountains often tell of life in little-known seas hundreds of millions of years ago. The history of America's remote past is written in the sedimentary rocks of our country.

A shell picked up from the mud or clay, or cracked out of a bit of limestone, may look like shells that you find on the beach today. Some are closely related to the animals that even now crowd the ocean bottom. But most ancient shells tell of sea animals who ceased to exist here on earth millions of years ago.

There are many good places throughout the North American continent to look for fossil shells. The Atlantic coast from New Jersey to Florida is an uplifted sea bottom and thus a rewarding hunting ground for shells that are millions of years old as well as for ones that are still in the making. The Appalachian Valley is cut into fossil-bearing rock and all along it prehistoric shells may be found.

Most of the Midwest once was under sea water, so numerous shell-bearing deposits can be found there. Many mountains in the West are made up of sedimentary rocks which contain fossils.

The best time to search for fossils is right after a hard rain, when some may have been washed clean of mud. The best place to look for them is in a freshly exposed area, where the bank of a stream is being washed away, or in a road cut.

## Many Different Types

There are many different types of fossils that you might find once you begin to look for them. If you are lucky, you might crack open a rock to discover the imprint of a fern that beautified the earth in its youth. The footprint of a prehistoric creature is a wonderful souvenir.

Occasionally the mummy of an early animal is preserved for man to ponder over. But much more often you will find a hard part like a bone or shell from which you can reconstruct a picture of the early creature to whom it belonged.

Fossil collecting is one of the cheapest hobbies that a person can have. All you really need is a pair of sharp eyes, a bag in which to put the specimens you pick up, and a good hammer. An ordinary hammer such as you might have in the tool chest is not adequate; you need a geologist's hammer which looks like a brick-layer's or slate-cutter's hammer.

It is not always necessary to go out into the country to look for fossils. Shells and skeletons of sea animals that lived hundreds of millions of years ago have been found right in the heart of Cincinnati, Cleveland, Chicago, Milwaukee and Buffalo.

In collecting fossils, always remember that they are evidences of ancient life and cannot be replaced. Occasionally there are only one or two of a kind, so handle with care. Take out the rock all around the fossil and label your specimen carefully, stating exactly where you found it and when. If you know the geological formation in which it was found, be sure to list it.

Do not confine your search to large fossils. Bones of ancient animals that reached a length of 80 or 100 feet long may be fun to find, but just where would you keep them? Small fossils less than an inch long are much more common.

## An Aid to Dating

Certain types of fossils are wonderful aids in dating geological deposits because some animals lived here on earth for only a few thousand years, which is a short time, geologically speaking. Minute changes through the centuries in the internal structure of their shells or in their skeletons indicate quite exactly the age in which they lived.

Billions of years ago the earth was a huge ball of liquid rock, so hot that no water would stay on its surface. As the earth cooled, a hard crust formed and water accumulated in the low places. It was in this water that life on earth first began.

The first animals were small, one-celled creatures. These developed into multi-celled forms with soft bodies. The first fossils were preserved when these primitive soft-bodied creatures developed hard parts which could be preserved.

Through the years some plants and animals learned to live on dry land. Seaweed was one of the first plants to become adapted to living in air. Scorpions, which hundreds of millions of years ago looked much as they do today, and lung fishes were pioneers among the animals.

Some plants and animals, however, never did learn how to survive on dry land nor could they adapt themselves to changes that took place in the sea. Eventually many groups of them became extinct.

Even the most short-lived of the plants and animals, however, today are helping scientists put together the jig-saw puzzle of life on earth millions and even billions of years ago. Those that differ most from the plants and animals that live in the world

today are the most helpful in dating deposits laid down in the sea-bottoms of the earth's crust eons ago.

Through fossils, paleontologists have been able to create a fascinating picture of the earth as it looked long before man appeared. They can visualize the animals and plants that inhabited the world long before horses developed, before mastodons lumbered through the forests and even before those 80-foot dinosaurs roamed over the land.

Though their fossils are now found on land, hundreds of millions of years ago the animals whose shells and skeletons you might unearth in your own back yard lived beneath the sea. They were preserved because they were covered by mud or sand during storms. When the sea-bottoms were uplifted and the marine water drained off, the old sea-bottoms became our sedimentary rocks. Often these rocks, in mountain-making movements, were subjected to heat and pressure so intense that the rock was altered and the fossils distorted or destroyed.

After being uplifted, rain washed some of the fossils clean of the clay and mud which had protected them through the eons. Ice and snow caused others to crack out of hard limestone in which they had been encased.

Strangely enough, shells of some rare modern sea animals that have lived from ancient times until today are abundant in fossil form. Hundreds of thousands of years ago, for instance, brachiopods with their familiar bi-valve shells lived in countless numbers along the North American coast, and the waters that spilled over the continent. Today in certain inland areas thousands of their shells can be found. But in the waters around our continent they occur in abundance in only a few places. They are found off the coast of Maine, Florida, Oregon, California and the West Indies; elsewhere they are scarce.

## Climatic History

Charles Darwin saw the past more clearly than others, and told us of the evolution of man and other animals. Since his time, geologists have been interpreting the story told by fossils. They explain how some ancient shells and other sea fossils laid down during different periods show that parts of our continent have been under the sea not just once or twice but many times.

Wrinkling and shifting of the earth's crust through the ages lifted land from the sea bottom, and the forces of weather etch the uplifted land into mountains. These mountains are worn down and may again sink beneath the sea.

Although some fossil-collectors travel all over the world in search of rare specimens, others prefer to be "arm-chair" collectors. Six interesting fossils have been collected for you by SCIENCE SERVICE. Each is more

than two hundred million years old; the combined age of the six is almost two billion years.

Each specimen in the kit is a relic of the earth's ancient past. It is the original skeleton or shell of an animal that lived in sea water when the earth was younger. It represents a form of life that is extinct today.

These fossils tell of life in the Paleozoic era, which began about half a billion years ago. During this age the land began to be covered with plants and lung-fishes first came out of the water to live on land. The era ended about two hundred million years ago, when amphibians and primitive reptiles ruled the earth.

The specimens were all collected on the North American continent. They were found in Ontario, Texas, Ohio, and one even came from within the city of Cincinnati. A wide variety of people, young and old, cooperated to complete this collection.

One specimen represents the lowest, primary subdivision of the animal kingdom; another is a sponge type that no longer grows in the sea. One is the "apartment house" in which a whole colony of prehistoric creatures once lived; another shows how tiny sea shells that lived almost four hundred million years ago can be cemented together with limestone.

This fossil collection, designed to give you some idea of the kind of animals that lived in the sea over two hundred million years ago, is available for the nominal cost of 75 cents each. Just write SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for the fossil kit.

Science News Letter, August 2, 1952

#### BIOCHEMISTRY

### Tung Nut Fat Used Tracing Fat Absorption

► **ELEOSTEARIC ACID**, a substance obtained from tung nuts grown in China, can be used as a tracer to follow the absorption of fat by the blood.

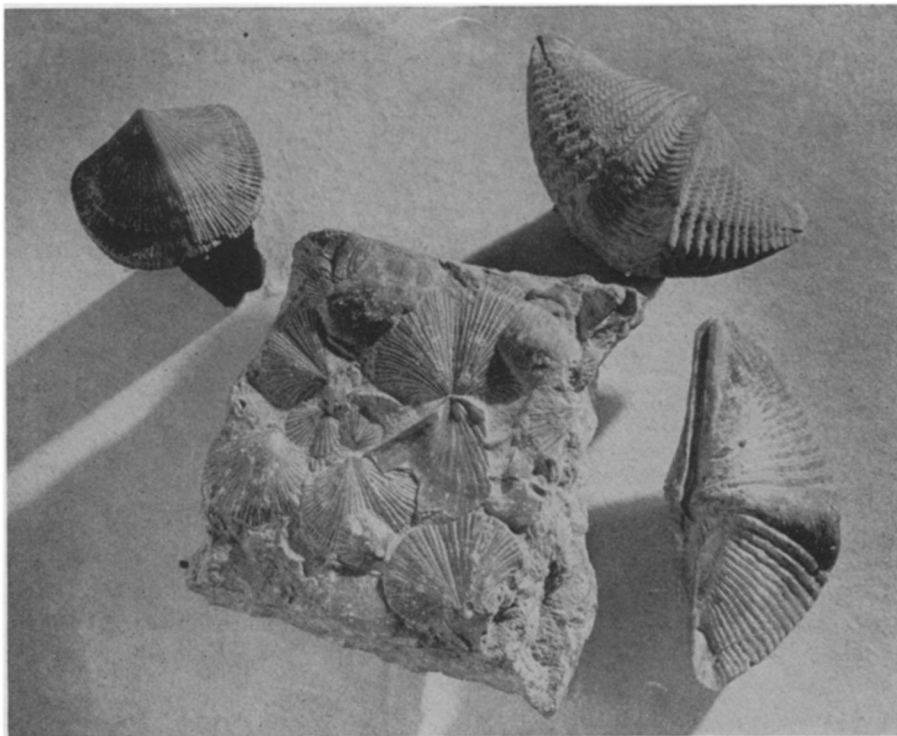
A new, rapid method of tracing fat absorption, announced by Dr. James F. Mead, chief of the biochemistry division of the Atomic Energy Project at the University of California at Los Angeles, may contribute to a better understanding of such diseases as sprue, jaundice, liver diseases and atherosclerosis.

A small blood sample can be drawn and studied in a spectrophotometer, which will record the amount of eleostearic acid in the blood. Previously, it had been necessary to remove entire intestines of animals to study their fat absorption.

The fatty acid is fed to the experimental subject with a fatty meal. At regular intervals following the meal, blood samples are taken and analyzed for eleostearic acid content.

Working with Dr. Mead were Mrs. Dorothy Long, laboratory technician, and Dr. Raymond D. Goodman, U.C.L.A. clinical instructor in medicine.

Science News Letter, August 2, 1952



**AMERICA'S PAST**—These sea shells, found far inland, are all over three hundred million years old. They were collected on the North American continent and throw light on the ancient past.

#### GENERAL SCIENCE

## Research Survey Begun

► AN INVESTIGATION into the nation's scientific research endeavors—in government, industry and colleges—will begin shortly. The National Science Foundation will conduct the investigation, a preliminary step to devising a national science policy.

The Foundation will try to discover how we are spending our research dollars, whether we are overemphasizing some fields at the expense of others, how our scarce resources of scientific manpower are being used.

Beginning of the work, one of the reasons for which the National Science Foundation was created, was made possible by an increase this year in the organization's appropriation. Congress came through with \$4,750,000, which was \$1,250,000 more than was appropriated last year.

In addition to the survey of the nation's scientific effort, the Foundation will continue supporting the fellowship program begun last year and will continue giving grants for basic research.

To conduct the survey, the Foundation will have to examine the research activities of all branches of the government—the Defense Department, the Bureau of Standards, Agriculture and others. In addition, industrial research and work being done in college and university laboratories will come in for appraisal. A study will be made of

how government contracts to universities affect their overall science programs.

As a first step, the Foundation has let a pilot contract to the American Physiological Society to make a study along these lines of its branch of science. If the contract works out, other such agreements will be made. The Foundation plans to go to the scientists themselves to appraise the scientific effort of the nation.

Science News Letter, August 2, 1952

*Sleeping bags* filled with processed chicken feathers yield twice the warmth of wool bags.

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