

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12

OCTOBER, 1941

No. 10

INTERTIDAL VEGETATION OF NORTH ATLANTIC COAST SHOWN IN NEW EXHIBIT

By FRANCIS DROUET
CURATOR OF CRYPTOGAMIC BOTANY

A habitat group showing the intertidal vegetation of the rocky north Atlantic shore has just been completed and installed in Martin A. and Carrie Ryerson Hall (Hall 29, the Hall of Plant Life), in the Department of Botany. Placed immediately to the right of the large alpine meadow group which occupies a central position at the north end of the hall, the new group is of the same size as the Illinois woodland scene installed about a year ago in a corresponding space on the left side.

Work upon this exhibit has been in active progress for more than a year. The material and studies on which it is based were obtained by two expeditions to the north Atlantic coast, one in 1939 by Mr. John R. Millar, and one in 1940 by Mr. Emil Sella, Chief Preparator in the Department of Botany. The first was sponsored by Mr. Sewell L. Avery, a Trustee of the Museum. Both expeditions visited the shores of the Bay of Fundy. The first one resulted in a large quantity of material with photographic records and observations which have served as a basis for the planning of the general lines of the group. A sketch model was prepared by Mr. Millar (then a member of the Department of Botany staff, now Curator of the N. W. Harris Public School Extension) on his return to the Museum. When other duties later prevented Mr. Millar's further attention to the project, it was taken over by Mr. Sella who has since carried the work to its present successful conclusion.

Although water covers nearly three-fourths of the earth's surface, many of us

do not realize that there exists in it a vegetation which perhaps exceeds in number of kinds and individuals the more familiar land vegetation. The large plants found in fresh water are chiefly flowering plants. A few mosses and algae are easily seen, but the majority of species present are of micro-



SEAWEEDES ON ROCKS NEAR EASTERNMOST POINT OF UNITED STATES

At hundreds of places along the shores of Maine and Canada grow the conspicuous algal plants reproduced in this new habitat group just completed and opened to public view in Martin A. and Carrie Ryerson Hall (Hall 29, Plant Life).

scopic algae familiar to the naked eye only at certain times during the year when millions of individuals grow together as scum and water-blooms.

Most of the water covering the earth's surface is salty, however, and is to be found far from Chicago in the oceans and the seas. There the algae are represented by thousands of species. Many are so small that they can be seen only under the microscope or where they have developed in large enough masses to form floating scums or coatings on submerged objects. They range in size according to species and habitat from minute few-celled plants to giant kelps hundreds of feet long. Those which are visible to the naked eye are popularly called seaweeds.

The seaweeds, well-known to everyone who has visited the coast, mostly grow attached to rocks along the shore; the familiar forms are those which cover the rocks between high and low tide-levels. On the Atlantic coast of North America from Cape Cod southward, the water is shallow along shore, and vast meadows of rockweeds (*Ascophyllum* and *Fucus*) are often seen exposed at low tide wherever rocks or stones are present.

Some kinds of seaweeds grow only where the water covers them completely at all times. Others grow only at such heights between tide-levels that they are covered with water for half of each day. Others develop only where they are exposed to the air most of the day and are covered with water for a short time at high tide. This peculiarity gives rise to a distribution of the species in horizontal zones, especially where the rocks

rise steeply out of deep water. Along the coast of northern Maine and Nova Scotia the difference between high and low tide-levels is in places more than fifty feet; where the rocky shore is precipitous, one sees a broad upper zone of certain species of *Fucus*, a lower zone of other types of *Fucus* mixed with *Ascophyllum*, and a still lower fringe of a large number of species of red, brown, and green seaweeds. At certain levels, especially toward low tide-mark, narrow fringes of dulce and Irish moss are seen where only a certain peculiar degree of submersion and exposure is to be found.

The greatest number of species is present at and just below low tide-level. Here and in deeper water the red algae predominate in number of species, though rockweeds,

kelps, and sea-lettuce may be more conspicuous in some places. On rocks in deeper water the seaweeds are entirely red algae; these are as a rule seen only when they are dredged from the bottom or become caught in fish-nets.

In the north Pacific Ocean the seaweeds which attract attention are primarily the brown algae. Here, mostly at and below low tide-level, one finds giant kelps (*Nereocystis*, etc.), the bodies of which are longer than our highest trees. They present considerable variety in structure, and many of the larger ones possess bladders or floats, filled with gas, which buoy up the free ends. The rocks are covered with red algae quite different from those on the Atlantic coast, many attaining considerable size.

In shallow tropical and subtropical waters the striking species are often the calcareous seaweeds. These are mostly classed as green and red algae. The green algae present the bizarre shapes of shaving brushes, parasols, and mushrooms. The red algae (corallines) develop as fragile or stony branching masses or occur as crusts on rocks. These calcareous algae play a considerable role, along with the corals (which are animals), in the formation of coral islands and reefs.

Some seaweeds exist in unattached state in the warmer seas. Certain species of sargassum, branching brown seaweeds which possess small globular floats, so cover many square miles of the tropical Atlantic Ocean that a large area there has been called the Sargasso Sea. Reports are that these algae have at times been an impediment to navigation. Certain microscopic algae develop in such profusion as to cover the water with a scum or to color its upper layers markedly, as do the dinoflagellates and *Trichodesmium*. The latter alga grows aggregated into very small flakes that color the water blood-red, and it is said to be responsible for the naming of the Red Sea.

A small number of conspicuous algae grow in brackish ponds along low-lying coasts where the salt water is diluted periodically by rains, and also in the mouths of rivers where fresh water is mixed with salt. In such places most of the seaweeds are green algae: *Enteromorpha*, *Ulva* (sea-lettuce), and *Cladophora*. Certain red algae, especially species of *Gracilaria*, are often in evidence. Such habitats are occupied mainly by hundreds of species of sulfur bacteria and of microscopic algae: diatoms, flagellates, and blue-green algae.

The same type of vegetation is characteristic of harbors polluted by wastes from large cities. *Ulva* and *Enteromorpha* are the conspicuous seaweeds, sometimes to the exclusion of all others. It is here that most people become acquainted with the huge detached plants of the sea-lettuce, floating or cast up on shore among an unappetizing assortment of debris.

Though many of them attain massive

size and the majority are large enough to attract the attention easily, the seaweeds are scarcely comparable with the flowering plants in shape and structure. Only a few—sargassums and some of the rockweeds and kelps—have organs which superficially resemble roots, stems, and leaves. Their cellular structure is very different. Not the least conspicuous feature about them is their color. Most seaweeds contain in every cell various chemical substances that mask the green coloring matter which they have in common with the cells of flowering plants. Since differences in methods of reproduction and certain features of internal structure and outward appearance go hand-in-hand with the type of coloring matter present, the seaweeds are classified according to their color. Thus the chief classes of algae are designated as the red, brown, green, and blue-green. The members of the last class are mostly small, developing as slimes on objects between tide-marks or as crusts on rocks in the salt spray above high tide-level; some, like the *Trichodesmium* mentioned above, give a distinctive color to the water where they occur in great numbers.

Among the red and green algae the plants are made up of fine or coarse threads or cords, variously branched; others are hollow tubes or delicate or tough membranes. The great variety of delicately branched forms has always been a matter of interest to those who enjoy making collections of beautiful and artistic natural objects.

IMPORTANT IN "ECONOMY" OF OCEANS

The algae constitute the sole food of myriads of marine animals and are thus of fundamental importance in the economy of life in the sea.

Seaweeds are useful to man in many ways. In China and Japan they are a common article of food. The bird's-nest soup of the Chinese is made mostly of algae. At least in Japan many species used as food are especially cultivated in sea-gardens. Certain red algae—dulse and Irish moss—are often used as food along the shores of the north Atlantic Ocean. Much of the iodine of commerce comes from the kelps. The agar so widely employed in bacteriological laboratories and in medicine is prepared from various seaweeds. Much interest has been shown in extracting material from seaweeds that can be used in place of rubber and plastics. Along coasts where they are plentiful the seaweeds have considerable importance as agricultural fertilizer and as a source of potash.

From the point of view of museum technique the new diorama is a notable achievement. In the hands of Chief Preparator Sella, the usual plastic materials, from plaster of Paris to lucite, employed with great skill and judgment, have served to produce a faithful replica of a bit of rocky seashore with its seaweed covering exposed

at ebb-tide. Some of the purely repetitious, mechanical work required for this, as for other recent exhibits, was performed under Mr. Sella's supervision by handicraft workers furnished by the Works Progress Administration. The background was painted by Staff Artist Arthur G. Rueckert.

THINGS YOU MAY HAVE MISSED

Tree Oysters

Oysters that live in trees are a strange feature of life in the swamps of Florida. They grow in clumps or groups, attaching themselves to the roots of mangrove trees. Half of the time they are in the water, and half of the time they are high and dry, as



AMPHIBIOUS BIVALVES

These oysters, from the Florida swamps where they attach themselves to mangrove roots, live out of the water during alternate six-hour periods, when the tide is out.

the tides ebb and flow every six hours daily. Tree oysters are especially adapted for this type of living, according to Dr. Fritz Haas, Curator of Lower Invertebrates. Ordinary or normal oysters could not survive the repeated periods of dryness, although they might occasionally endure an isolated six-hour period out of the water, he says.

A small group of these odd creatures, attached to a section of mangrove as in their life habitat, is on exhibition in the Hall of Lower Invertebrates (Hall M). Those shown in the accompanying illustration will be installed at a future date. They have a distinctly plant-like appearance, resembling some sort of fungus growth. This is so marked that one of the Museum's specimens attracted the attention of a visitor to Dr. Haas's office and led him to inquire why a "plant specimen" had been transferred to the Department of Zoology.



Drouet, Francis. 1941. "Intertidal Vegetation of North Atlantic Coast Shown in New Exhibit." *Field Museum news* 12(10), 1-2.

View This Item Online: <https://www.biodiversitylibrary.org/item/25723>

Permalink: <https://www.biodiversitylibrary.org/partpdf/364947>

Holding Institution

Field Museum of Natural History Library

Sponsored by

University of Illinois Urbana-Champaign

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the Chicago Field Museum.
For information contact dcc@library.uiuc.edu.

Rights Holder: Field Museum of Natural History

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.