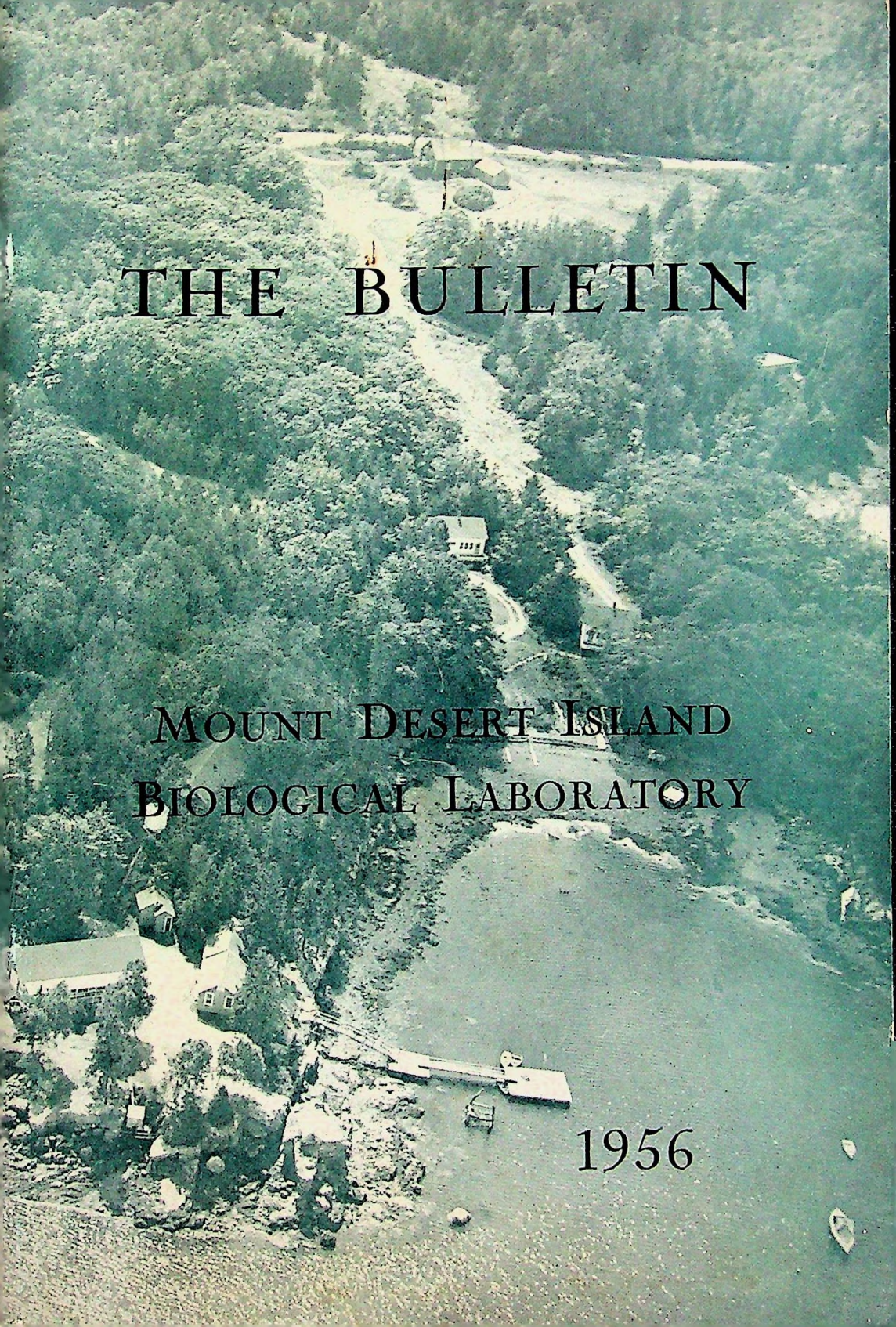

THE BULLETIN

MOUNT DESERT ISLAND BIOLOGICAL LABORATORY

1956

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JULY 1956

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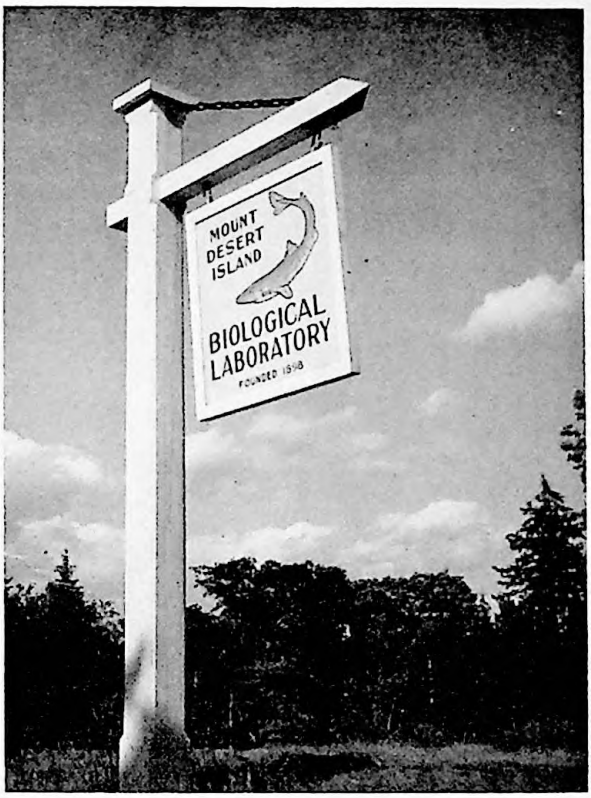


Volume IV of the Contributions of the Mt. Desert Island Biological Laboratory began with the Bulletin for 1953. No Bulletin was issued in 1954 or 1955. The 1956 Bulletin constitutes part 2 of Volume IV.

Aerial photographs by George C. McKay, Jr., Bar Harbor, Me.

Photographs on page 63 (upper) and page 64 (lower) by Margaret Markham, Medical News, New York, N. Y.

Submitted for publication July 31, 1956.

Warner F. Sheldon, M. D., Director

Laboratory Point at Ebb Tide

THE MOUNT DESERT ISLAND BIOLOGICAL LABORATORY 1956

The Mount Desert Island Biological Laboratory is a marine laboratory located on the coast of Maine. It is an institution owned and operated by an association of scientists for the purpose of providing basic research facilities for investigators who wish to work in a summer laboratory. All scientists, teachers, or advanced students are welcome. The bulk of the personnel are drawn from the biological and medical fields and many types of scientific backgrounds are represented. This diversity of scientific training, interests, and skills is a prime asset. The relaxed unhurried atmosphere of the summer laboratory provides unusual opportunities for discussion, consultation, and co-operative research. The tangible benefits of these collaborative efforts are evidenced by the research reports to be found in this and previous Bulletins.

These are only the more obvious results of the work of scientific institutions of this type. Other more profound benefits, to science in general, and to the participating investigator in particular, result from the broadening of outlook and thought occasioned by the easy interchange of ideas, information and philosophy. In the laboratory or at play, all discussions inevitably come back to "science", its broad aspects or its infinite detail. The opportunities presented by institutions of this type make more complete scientists and better investigators of those with the good fortune to be able to participate.

In the past the Laboratory has ventured sporadically into the field of formal undergraduate teaching. While these efforts have been eminently successful, the present members of the Laboratory feel that our best educational work can be done by training in research, graduate students who plan careers in biology or medicine. The student serves as a member of a team, learning research techniques and methods through actual participation in the work of a small group led by experienced investigators. Special seminars are held but no formal courses are given.

History and Organization.

The Laboratory was founded at South Harpswell, Maine in 1898 as The Harpswell Laboratory by Dr. J. S. Kingsley of Tufts College. In 1913 it was incorporated in the State of Maine as a non-profit scientific and educational institution. In 1921, the Laboratory was moved to its present location on Mt. Desert Island and its present name was adopted in 1923. The original land at Salisbury Cove, known as the Weir Mitchell Tract, was a gift from the Wild Gardens of Acadia. The present development in land, buildings, and equipment has been the result of many generous contributions by summer residents of the Island. Operating revenue derives from laboratory fees, cottage rentals, membership dues, and scientific grants from governmental and private sources. Capital improvements are usually

dependent upon the receipt of special gifts. The business and scientific management of the Laboratory is in the hands of the Director and the Executive Committee. The Directors have been: Ulric Dahlgren (1920-26), H. V. Neal (1926-31), William H. Cole (1931-40), Roy P. Forster (1940-47), J. Wendell Burger (1947-50), Warner F. Sheldon (1950-56), and Raymond Rappaport (1956-to date). The By-Laws of the Corporation are to be found in the 1934 Bulletin.

Location.

Mount Desert Island has long been world famous for its scenic beauty and agreeable summer climate. The Island lies in the Gulf of Maine about 150 road miles east of Portland, Me. and is connected to the mainland by a short bridge. The land area of more than 100 square miles, is featured by a range of bold, ice-eroded mountains that form a belt across the center and a narrow natural fiord 6 miles deep that partly divides the east and west halves. Between the mountains lie numerous deep fresh water lakes and shallow ponds. Much of the mountainous area is a part of Acadia National Park and is protected against human depredations. The Island lies near the mouth of the Bay of Fundy and is separated from the mainland and adjacent islands by narrow deep bays. Strong tides average 10-12 feet.

The many varied biological resources of the Acadian area are readily available. In summer the cold waters of the Gulf of Maine are extremely rich in marine life. The rocky shores, mud flats and strong tidal currents provide a large variety of unusual forms. Proximity to fresh water lakes and ponds, and the mixed terrain give further diversity to the forms available for experimental purposes. As in every region certain forms are abundant, others are scarce or absent. Perusal of the research abstracts in past Bulletins will often give a good indication of forms that are easily available. The Director will be glad to furnish a candid estimate about any special forms that investigators may propose to use.

Physical Plant

The Laboratory itself is a tract of about one hundred fifty acres, fronting on Frenchman Bay at Salisbury Cove, in the Township of Bar Harbor. This rural village is in the more level open part of the north shore of the Island. Besides shore frontage, the Laboratory owns part of a good-sized fresh water pond and brook, and its land varies from meadow to forest to bog.

Laboratory buildings are equipped with the basic facilities for research: Running salt and fresh water, electricity, Pyrofax gas, distilled water, compressed air, tanked O_2, a marine dock, aquaria, live-cars, darkroom, a refrigerated and several clinical centrifuges, chain-o-matic and torsion balances, electric ovens, refrigerators, incubators, Warburg apparatus with a cooling system, Baird flame photometer, Beckman pH

meter, colorimeter, basic chemicals, glassware, smaller apparatus, and collecting equipment. Investigators are urged to bring their own specialized equipment and chemicals. In special cases the Laboratory may be able to provide apparatus which would have long-term general usefulness for other workers. With the Laboratory closed for nine months of each year, the general policy has been to maintain as little delicate or especially valuable equipment as possible.

Laboratory Buildings

1. *Neal Laboratory* (Main Laboratory). The oldest and largest of the Laboratory buildings was completely remodeled in 1955 with funds provided by the National Science Foundation. There are now eight modern laboratories, four large rooms will each accommodate 3-4 persons and four small rooms each with space for 1-2 persons. Water troughs with racks for salt and fresh water aquaria and large stone sinks are located along the north wall of the building.

2. *Equipment Laboratory and Stock Room.* This laboratory was built in 1955 to house equipment used in common by members of the Laboratory. Working space for the refrigerated centrifuge (International PR2), Warburg apparatus (circular model), Baird flame photometer, torsion balance, pH meter, deep freeze, etc. occupy more than half of the building. The remainder serves as a stock room for chemicals, glassware and small apparatus.

3. *Hegner Laboratory.* This building was modernized in 1947 at which time it was equipped for workers utilizing culture techniques. There are eight separate laboratories, each capable of accommodating from 1-3 persons. A preparation room contains a drying oven, electric furnace, stills, gas stove and a small autoclave. Space is provided for several egg and general purpose incubators and a refrigerator. Half the building is provided with running salt water.

4. *Halsey Laboratory.* This building contains four large rooms, each capable of providing working space for 2-4 people.

5. *Fresh-water Laboratory.* This structure consists of two adjacent one-room buildings, each large enough to accommodate as many as 3-4 people.

6. *Kidney Shed.* A single large laboratory has been used for many years by Dr. Homer W. Smith and his group.

7. *Office and Library.* A separate building, newly built in 1955 with funds provided by the National Science Foundation, contains the Director's Office and houses the business records and library. The library is small, comprising reference texts for biology and medicine, with only a few complete journals (notably Biological Abstracts, Biological Bulletin, and the Journal of the Marine Biological Association) as well as monographs and a sizeable reprint collection.

8. *Dark-room Laboratory.* A one room structure with running salt and fresh water.

9. *Marine Dock.* An excellent double-float dock contains built-in live wells, and has large live cars attached. Row boats and a motor boat are available for collecting trips.

10. *Shop.* A two room structure with simple tools.

11. *Dahlgren Hall.* The former village school house has been converted to use as our meeting hall. The single large room is capable of seating more than 120 people. Projectors for regular lantern slides, 35 mm. slides and 16 mm. silent movies are available.

12. *Bowen Hall.* This building is one of the finest examples of "colonial-type" architecture on the island. It is used as a recreation center and dining hall by the Co-op group, those who occupy rooms in the village. It contains lavatories and showers and, upstairs, a single room for the Co-op manager.

Special Program

Renal and Electolyte Physiology.

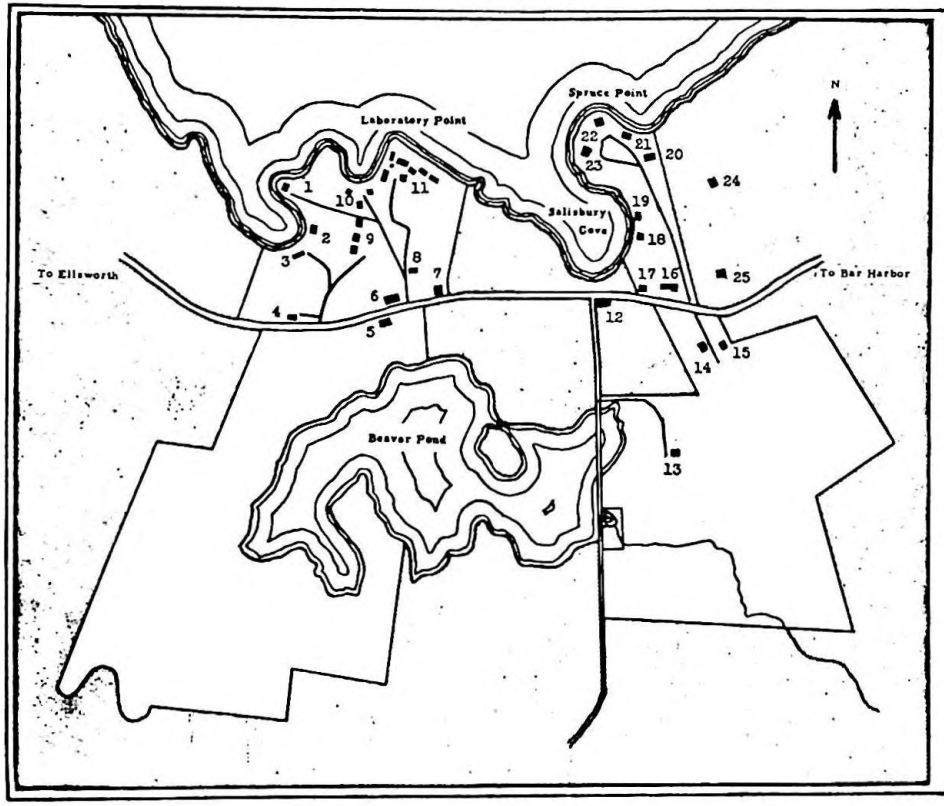
Studies of renal function carried out at the Mt. Desert Island Biological Laboratory by Drs. Homer W. Smith, E. K. Marshall, Jr., Roy P. Forster and many others over the last 30 years have won world renown. In many instances the basic research has been uniquely indebted to the opportunities presented at this Laboratory. These studies have culminated in the development of methods for measuring the rate of glomerular filtration, renal blood flow, and tubular function in man as well as in experimental animals.

In recent years often half of the total laboratory personnel have been working in this field. Leaders in a variety of allied fields are readily available for consultation or cooperative research. Here is a unique opportunity for the young research worker to get advice and help. Numerous informal seminars of special interest to workers in this field are scheduled.

Housing

Fourteen cottages suitable for families with children stand on land owned by the Laboratory. All are within easy walking distance of the Laboratory Point itself. These cottages are available for rent to workers by the season, or occasionally for shorter periods. Occupants supply their own blankets, linen, and silver and pay for utilities (electricity, gas, water and rubbish removal).

Single investigators and couples without children rent rooms in homes in the village and take their meals in the Laboratory Co-operative Dining Association in Bowen Hall. A manager-cook is hired by the Laboratory Director. Other household chores (cleaning, table setting, dish washing, etc.) are apportioned equally among the participants who usually number 20 to 25.



MT. DESERT ISLAND

BIOLOGICAL LABORATORY

1956

Building Key

1. Forster
2. Bevelander
3. Rappaport
4. Red House
5. Emery
6. Bowen Hall
7. Dahlgren Hall
8. Burger
9. New Cottages (1954)
10. New Cottages (1952)
11. Laboratory
12. General Store and Post Office
13. Liscomb
14. Byrnes
15. Hoskins
16. Neal
17. Zubrod
18. White
19. Hiatt
20. Smith
21. Sheldon
22. Lewis
23. Marshall
24. Kenlois
25. The Loft

Scale

1000'

Bowen Annex, a small single room building standing in the edge of the woods about 100 yeards from Bowen Hall, has cots for three young men. The cost is considerably less than for rooms in the village and occupants must supply their own blankets and linen.

Land Lease Policy

In order to encourage private construction and ownership of cottages by workers, the Laboratory has a policy of issuing leases on certain plots of valuable laboratory land at a nominal charge. Provision is made for sale or rental of the cottage to other workers in case the owner should find it impossible to continue to work in the Laboratory. In this way the Laboratory is able to encourage capital investments by individual laboratory workers and at the same time insure that the property will remain under Laboratory jurisdiction. Five privately owned cottages stand on land leased to members by the Laboratory. These are held by Drs. Bevelander, Forster, Rappaport, Sheldon, and Zubrod.

Recreational Activities

Besides notable scientific resources the Island provides many other features of interest for laboratory workers. Mt. Desert Island has long been known as one of America's most desirable summer regions. The cold waters of the Gulf of Maine make the summer climate superb. The ocean, rocky shores and mountains give unexcelled scenic beauty. The rather considerable distances from the large metropolitan areas have helped to keep it relatively unspoiled.

Swimming, hiking, mountain climbing, picnicking, boating and sailing, ocean or fresh water fishing and many other sports are easily available. Acadia National Park with its excellent naturalist's program contributes to the general interest. In addition there are small museums of Indian and local lore, public gardens, and cultural exhibits. The Island and adjacent coast serve as the summer home or vacation site for many well known scientists. Proximity to the two divisions of the larger year-around Jackson Laboratory adds to the scientific interest and resources.

Salisbury Cove itself is an old fishing and farming hamlet on the north shore of the Island. It lies on the main road between Bar Harbor and Ellsworth, the railroad terminus on the mainland. The atmosphere here is quietly rural. The Laboratory colony itself comprises about 75 adults and 50 children of assorted ages, the whole numbering a considerable proportion of the summer population of the village.

Bar Harbor proper, about six miles from the Laboratory, contains most of the services of a city, including excellent shopping facilities and a good hospital. The widely publicized fire of 1947 did no damage to the Laboratory area, nor were its visible effects on the Island as marked as might be supposed. For biologists the ecological changes produced by this fire are of great interest.

APPLICATIONS

Research rooms rent for $100-$250 for the season, June 15th to September 15th. Each individual, investigator or assistant, is asked to pay a laboratory fee of $100 if possible. This fee is ordinarily paid by the investigator's home university, department, or from a grant. In special circumstances reduced rates or fellowships can be arranged. Each worker is entitled to the general facilities of the Laboratory but special arrangements are necessary if unusual demands are anticipated. All workers are requested to bring their own specialized equipment.

Fourteen cottages owned by the Laboratory are rented to families by the season or occasionally for shorter periods. Several other privately owned cottages are usually available to laboratory workers. Rates for cottage rental are about $300-$350 per season depending on size and location. Distant cottages may often be rented through realtors at somewhat greater cost.

Single investigators or couples without children may rent rooms in nearby private homes. This group (usually 25) organizes the Co-operative Dining Association in Bowen Hall. A competent cook-manager is hired by the Laboratory Director. The domestic chores are apportioned equally among the participants.

Several Fellowships supported by income from the Ulric Dahlgren Memorial Fund (a gift of the American Philosophical Society) and by the National Science Foundation are awarded annually to research workers or their assistants. Awards may be used to assist workers to meet laboratory fees, living or traveling expenses.

All applications and inquiries should be addressed to the Laboratory Director:

Dr. Raymond Rappaport, Jr.
Department of Biology
Union College
Schenectady 8, N. Y.

Scientific Activities

The following sections of the Bulletin are devoted to recording the scientific activities of the Laboratory during the years 1953, 1954, and 1955. Each section contains a list of scientific personnel, staff, seminar program and brief reports of the results of investigations. These have been edited to insure uniformity of arrangement but otherwise are essentially in the form in which they were submitted by the author.