

THE THIRD ANNUAL REPORT OF THE BOWDOIN SCIENTIFIC STATION

Bulletin No. 4 Bowdoin College, Brunswick, Maine February 1, 1938

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Donald B. MacMillan
Alfred O. Gross
Manton Copeland
John S. Rockefeller
Sumner T. Pike
Edward N. Goding
Albert T. Gould
Alger W. Pike
Henry S. Shaw
Charles F. Brooks
Philip W. Meserve

Field Director

William A. O. Gross

THE BOWDOIN SCIENTIFIC STATION

Kent's Island, Bay of Fundy

New Brunswick, Canada

THE THIRD ANNUAL REPORT OF THE BOWDOIN SCIENTIFIC STATION

44 Geological Museum
Harvard University
Cambridge, Mass.
February 1, 1938

To the President and Trustees
of Bowdoin College and the
Directors of the Bowdoin
Scientific Station

Sirs:

I have the honor to submit the third annual report of the Bowdoin Scientific Station at Kent's Island covering the year 1937.

The past season was marked by a successful research program and by notable additions to the Station's equipment including two new buildings, a 150-foot wharf, a 500-watt radio transmitter, and a new electric generating plant. The personnel of the Station was the largest in its history. This expeditionary group spent three profitable and pleasant months on the island without experiencing any accident or sickness of any kind.

It is with great pleasure that I announce that Professor Philip W. Meserve of Bowdoin has accepted a place on our Board of Directors.

THE STAFF

The present directing board of the Station includes:

Donald B. MacMillan, Provincetown, Mass.
Alfred O. Gross, Bowdoin College, Brunswick, Maine
Manton Copeland, Bowdoin College, Brunswick, Maine
J. Sterling Rockefeller, 25 Broadway, New York, N.Y.
Sumner T. Pike, 120 Wall Street, New York, N.Y.
Albert T. Gould, 1 Federal Street, Boston, Mass.
Edward N. Goding, 626 Tremont Building, Boston, Mass.
Alger W. Pike, Lubec, Maine
Henry S. Shaw, 136 High Street, Exeter, N.H.
Charles F. Brooks, Blue Hill Observatory, Milton, Mass.
Philip W. Meserve, Bowdoin College, Brunswick, Maine
W.A.O. Gross, Secretary, 44 Geological Museum, Cambridge, Mass.

In the field staff which was officially based at the Station from June 15th until September 15th were W.A.O. Gross, Director, Harvard, Brunswick, Maine; Robert W. Harrington, Jr., Assistant Director, Bowdoin, Newton, Mass.; Nahum R. Pillsbury, Jr., Commissary Officer, Bowdoin, South Braintree, Mass.; Newell E. Gillett, Chief Navigator, Bowdoin, Worcester, Mass.; Daniel W. Healy, Zoologist, Bowdoin, River Edge, N.J.; Ernest A. Joy, Caretaker, Little Wood Island, N.B.; Lester E. Tate, Maintenance Dept., Ingall's Head, N.B.; Thomas A. Gross, Radio Engineer, Bowdoin, Brunswick, Maine; Robert M. Cunningham, Meteorologist, Cambridge School, Cambridge, Mass.; Charles W. Valencourt, Ornithologist, Carleton College, Milwaukee, Minnesota; Frederick H. Crystal, Radio Operator, Bowdoin, Woodmere, L.I.; George M. Cadman, Radio Operator, Harvard Dental School, Pleasantville, N.Y.; Donald Patt, Invertebrate Zoologist, Bowdoin, Jamaica, L.I.; Everett L. Giles, Bowdoin, East Baldwin, Maine; Charles F. Taylor, Cambridge School, Weston, Mass.; Orin C. Pillsbury, Boat Engineer, Thayer Academy, South Braintree, Mass.; Sydney M. Barker, Artist, Boston, Mass.; Robert M. Goehring, Cambridge School, Cambridge, Mass.

Robert W. Harrington, Jr., a Teaching Fellow in Biology at Bowdoin, will serve as Assistant Director next year. Naham R. Pillsbury, Jr. and Newell E. Gillett will enter upon their third season as Commissary Officer and Chief Navigator respectively.

Visiting scientists and college professors offered assistance at various times. Mr. Albert R. Brand of Cornell University made an extended stay during the sound recording activities. Dr. Ollin S. Pettingill of Carleton College and Dr. Alfred O. Gross of Bowdoin were of great aid in the ornithological investigations. More scientific people will be able to visit the station in the future since adequate facilities to handle guests are rapidly becoming available.

Lester Tate was in charge of building construction and will superintend the planting of our new vegetable garden. Ernest Joy has rounded out his third year as caretaker of the Station. He is now able to send his winter reports in via radio.

STATION EQUIPMENT

Two new buildings were built during 1937. The "Tool House" is 12' x 30' in size. It has a roof of asphalt shingles and brick-like siding presenting a very effective appearance. These materials were donated by Bard & Son, Inc. of Walpole, Mass. The north half of the structure is used for the Ford car and other equipment during the winter. It also contains work benches and tool for carpentry and mechanical work. Since the Station must be comparatively self-sufficient, the need of a well equipped repair and construction shop has been long felt. A darkroom and

the electricity generating room occupy the rest of the building. A two kilowatt, 110 volt A.C. gasoline driven plant and the 32-volt Exide batteries represented our power facilities last summer. However, a most fortunate recent purchase has enabled us to secure a heavy-duty three kilowatt plant powered by a water-cooled 4-cylinder engine. This unit weighing more than ton and its elaborate switch board with fuses, switches, meters, and rheostats will amply provide for all future electricity needs. The smaller plant is to be used for the radio station. Overhead wires connect with the other buildings for lighting purposes. There will be space in the generating room for a water pump to serve the well in progress nearby. It is hoped that next summer will see the completion of the well and plans laid for a running water system.

The valuable equipment of the 1000-watt short wave transmitter of our radio station, VE1IN, is housed in a new 9' x 12' building which is also completely covered by Bird materials. It is planned to mount two permanent masts to replace the temporary aerial masts used last summer.

A 150-foot wharf was built replacing the old one. It is ten feet wide and is planked with heavy timbers. An extensive rock-filled cribwork extends throughout its length. The old wharf house has been reshingled and otherwise reconditioned. Its second floor is fitted up as sleeping quarters for three people. The old smoke house was torn down and much of its wood used on new construction. The long building near the wharf is to be reshingled next summer and otherwise reconditioned.

Another Kalamazoo stove was given by President Blakeslee of the Kalamazoo Stove Company, and it was installed in the kitchen of the dormitory. Twenty new mattresses and cots were purchased. A watch tower was built atop the dormitory. The Hodgson House was painted. A new outdoor toilet building was erected. A Ford car was purchased on Grand Manan and rafted to the island. It has proved most useful for transporting equipment and supplies to and from the wharf and the main buildings.

The Scientist under the command of Newell E. Gillett completed its second successful season. It will be necessary to install a new 90 hp engine as the present 45 hp motor is not adequate. The latter is to be overhauled and used in a smaller boat the Station hopes to acquire in the future. The Scientist with its two motors should have a combined horsepower of about 160. Additional life jackets, another fire extinguisher, and new gasoline tanks are needed. It is planned to install two-way radio and a radio compass next summer.

Dr. Nahum R. Pillsbury generously contributed a complete medical kit to the Station.

I want to take this opportunity of thanking the Socony-Vacuum Oil Company for their kind donation of all of our gasoline, kerosene, and engine oil for the third consecutive season. We are also indebted to the kind contributions of other firms among whom the following made notable contributions:

Aluminum Company of America
American Bronze Company
Bird & Son, Inc.
Briggs & Stratton Company
Celotex Corporation
Champion Spark Plug Company
Coleman Lamp and Stove Company
Dazey Churn and Manufacturing Company
Electric Storage Battery Company
Hood Rubber Company
Ithaca Gun Company
Kalamazoo Stove Company
Marbles Arms and Manufacturing Company
B. F. Moore and Company
Palmer Match Company
Plymouth Cordage Company
Socony-Vacuum Oil Company
Thermos Bottle Company
Western Cartridge Company

COMMISSARY

An excellent board was offered last summer thanks to the efforts of Nahum R. Pillsbury, Jr., the commissary officer, and of Donald Patt, the cook. The new Kalamazoo stove was a great aid and the Electrolux refrigerator again proved its worth. On many occasions more than thirty-five people were served. Besides the regular chef, a full-time dishwasher should be hired in future years. A vegetable garden is to be planted in the spring by Mr. Tate, and a cow will be purchased for milk during the summer and then resold in the fall. Having our own fresh vegetables and source of milk supply will effect both economies and better meals. We plan to butcher a calf or a lamb each week, and fresh seafood and seal meat will be obtained as often as possible.

The following concerns made generous contributions for the second and in the instance of Burnham & Morrill for the third consecutive time:

Burnham and Morrill Company
Cape Cod Cranberry Company
Corn Products Sales Company
General Food Sales Company
Hawaiian Pineapple Company
F. M. Hoyt Company
Libby, McNeill & Libby Company

National Biscuit Company
Phillips Packing Company
Quaker Oats Company
R. J. Reynolds Tobacco Co.
Standard Brands, Inc.

RESEARCH PROJECTS

Meteorology: Weather Observations begun last summer are being carried on regularly. Instruments include a Hygrograph, Thermograph, Maximum and Minimum Thermometers, Sling Psychrometer, and Rain Gauge. Observations for evaporation and moisture content of the air were made at various times with special devices. An anemometer and an anemoscope are to be installed so that accurate records of wind velocities and directions can be kept. The Blue Hill Observatory is giving us full co-operation and much credit goes to Robert M. Cunningham for his excellent work.

Geography: Mr. Adriel U. Bird kindly lent the use of his airplane for a photographic flight to the island. However, heavy fog grounded the plane at Rockland, Maine and prevented it from reaching the island. Robert Stone from Blue Hill was aboard as meteorologist. It is to be hoped that this project can be carried out next summer. Newell E. Gillett and W.A.O. Gross are to make a topographic map of the island using the control established by the triangulation of James E. Levings of the Institute of Geographical Exploration two years ago. It is hoped to have our map completed and published by next fall. A stand for the automatic recording tide gauge was erected in the outer harbor. It is supported by four piles and should last for many years. Its completion comes after an unsuccessful attempt last year and represents a great deal of effort.

Ornithology: Dr. Ollin S. Pettingill's paper on the "Birds of Grand Manan" is ready for publication. Dr. Alfred O. Gross is completing a treatise on the Eider Duck. Latimer B. Hyde and Howard B. Miller have completed studies of the Black Guillemot and the Black-backed Gull respectively.

Bird Banding: Nahum R. Pillsbury, Jr. reports another excellent season with Kent's Island being station No. 1 of an international bird banding survey. More than 23,000 birds have been banded at the island to date.

Sound Recording: The first sound recordings of bird songs ever to be made with a radio link were successfully secured. Mr. Albert R. Brand was in active charge of the project. The combined efforts of the radio operators, Cornell sound truck technician, and the ornithologists were responsible for this unique exploit.

It is planned to make more recordings next summer.

Botany: The field work of Dr. David Potter of Clark University and Henry A. Gleason of Cornell University represent our main contributions in this field. There is much more room for additional collections and ecological studies. Some collecting should be done during the latter part of May.

Invertebrates: Daniel W. Healy made a collection of insects during the past season. These are now in process of being identified and catalogued. Donald Patt added to our data on the littoral life.

Radio: A contribution entitled "Designing the First Stage of the Speech Amplifier" was published as one result of experimental work. Adequate facilities are available for a considerable research program next summer.

Winter Observations: Ernest Joy is keeping records of the bird movements and meteorological observations during the winter. He is operating a small power short wave transmitter and so is in contact with the mainland. A winter visit was made by Dr. A.O. Gross, Newell E. Gillett, Thomas Gross, Charles Brand, Murray Litchfield, and W.A.O. Gross from December 28, 1937 to January 1, 1938. A bird census was taken and other observations made.

THE GREAT BLACK-BACKED GULL (Larus marinus)
(by Howard Miller, Bowdoin 1938.)

The Great Black-backed gull is increasing in numbers as a nesting bird of Kent's Island. It is reported that only one pair of the birds was present in 1930. During the summer of 1936 the author located four nests with eggs and observed the chicks of three others making a total of seven pairs of nesting birds. In 1937 the members of the Bowdoin Scientific Station reported more than a dozen pairs nesting on the island.

The nests of the Black-backed Gull are restricted to the higher sections of the southern end of the island in the midst of the thickly populated Herring Gull colony. The nests are generally located relatively near each other. In 1936 no two of the four nests which I studied were placed more than 240 feet apart.

Nesting: According to Mr. Ernest Joy, resident naturalist warden of Kent's Island, the first Black-backed Gulls arrive the last of February or the first week of March. In 1936 the first egg of this species was found by Mr. Joy on April 29. However, the majority of these gulls do not lay their eggs until the first week of May. The nesting site selected is usually on the top of a mound. A slight excavation is made to which the nesting materials of grasses,

feathers and dead weed stalks are added. The measurements in inches of the four nests studied in 1936 are as follows:

	1	2	3	4
Diameter of nest	22	22	16 x 25	18 x 23
Diameter of bowl	11	11	11 x 12 1/2	12
Depth of nest	2	2 1/4	2 1/2	3

Measurements in millimeters were made of the eggs in three of the above nests as follows:

		Long Diameter	Short Diameter
Nest Number 2	1.	78.5	53.0
	2.	74.0	54.5
	3.	72.5	55.0
Nest Number 3	1.	76.0	54.5
Nest Number 4	1.	80.0	53.5
	2.	79.5	55.0

The long diameter of egg number 3 of nest number 2 is of interest since it is much less than the minimum for this measurement in a series of 59 eggs of various collections examined by A. C. Bent. The weight of freshly laid Black-backed Gull eggs varies from 105 to 125 grams. The average weight is approximately 115 grams. The loss of weight during incubation is .36 grams per day making the average total loss of each egg during incubation at about 10 grams.

Incubation. Both adults incubate. Each bird occupies the nest for a period of about two or three hours before changing places. In the case of a pair observed continuously from a blind one bird remained on the nest for five hours before being relieved by her mate. The incubation period of the Black-backed gull is twenty-eight days. After the egg is pipped it requires 24 to 28 hours for the young to emerge.

The young are precocious and leave the nest a few days after hatching. The adults are noisy on the breeding grounds especially after the young have made their appearance. The calls while similar to those of the Herring Gulls are considerably deeper and hoarser.

The Black-backed Gull dominates the colony of sea birds on Kent's Island. Being the first to start nesting they choose the best sites and establish their territories (a radius of about twelve to fifteen feet) which is kept clear of other nests. The Herring Gulls avoid the Black-backed Gulls on the ground but it is not unusual for the Herring Gull, the more agile flier, to be aggressive on the wing and to vigorously attack the larger intruders. The Black-backed Gulls cause the death of many Herring Gull chicks which unwittingly wander into their territory.

Food. Fish comprises the major part of the food of the Black-backed Gull but they are also known to eat crabs and other crustaceans. This gull has been accused of eating other birds especially the downy young Eiders. However, during the two years I have studied this bird on Kent's Island I have yet to see one of these gulls devour a young bird. This in spite of the fact that they nest in the midst of the colony of 300 pairs of Eider Ducks and about 10,000 pairs of Herring Gulls. If the normal sea food is abundant I am inclined to believe they will not eat other birds although they may seriously molest the young.

The measurements, weights and temperatures of the young at different ages are presented in the following tables, -

Age	1	2	4	8	12	20	35	50	1 year
Length	172	179	208	254	305	380	480	635	660
Extent	151	164	193	255	357	630	1170	1512	1390
Wing	27	28	30	36	50	113	237	381	412
Wing-body	65	70	74	114	167	281	520	695	675
Tail					5	10	50		142
Bill	18	19	21	26	30	37	49	57	64
Bill-eye	30	32	36	43	50	65	76	92	101
Bill-gape	30	33	37	44	55	63	79	95	96
Bill-nostril	9	9.5	10	11	13	15.5	19	24.5	29
Bill depth	9	10	10	10.5	12.5	13.5	15	19.5	23
Eye diameter	7	7	7.5	8.5	10			13	12
Tarsus-toe	52	60	65	81	96	119	143	160	153
Tarsus	22	26	27	36	41	57	72	91	
First toe	6	7.5	7.5	8.5	10	10.6	13.5	13.5	17
Second toe	23	26	29	34	42.5	49	56	60	57
Third toe	30	34	38	44.5	55	62	71	79	83
Fourth toe	26	29	32	39.5	49	57	67	70	77
First nail		2.5	3	3.5	4	4.6	6	7	10
Second nail		4.8	5.5	6	6.5	7.6	9	11	11
Third nail		6	6.5	7	8	8.7	11	14	18
Fourth nail		4.2	4.5	5	5.2	6	8	10	13
6th Primary						35	137		252
6th Secondary						23	93		156
Weight	80	88	132	236	410	742	1183	1562	
Temperature	100.4,	101.7		103.9		102	106.8		

PARASITOLOGY

Preliminary Report on the Internal Parasites of the Herring Gull.
(by R.W. Harrington Jr. and N.R. Pillsbury Jr.)

Forty-four Herring Gulls were examined: thirty-four apparently healthy and ten sick ones. One Black-backed Gull, one Harbor Seal, and two Herring were also examined. The birds were shot either on the shore or in the trees of the wooded parts of the island, but a number of sick birds were picked up on the beach. The majority of the gulls were females.

The maximum, minimum and average weights of the adult gulls were as follows, -

	Healthy (20 birds)	Sick (5 birds)
Maximum	1244 grams	998 grams
Minimum	671 grams	633 grams
Average	1003 grams	815 grams

Stomach contents. Nineteen contained Herring, eighteen were empty, seven each contained respectively, - maggots; insects and fish bones; herring, stones and molluscs; grass; twenty-seven isopods of the species *Idothea baltica*; salmon; shrimp. No parasites were found in the stomachs.

The alimentary tracts of two immature and three adult gulls were apparently free of parasites. Parasites were found in the following number of cases: Cestodes 12; Nematodes 9; Trematodes 6; and Acanthocephalids 1. Nematodes were found in the Seal, Black-backed Gull and the herring.

Technique. The birds were weighed, sexed, the contents of the stomach noted, the walls of the stomach, the oesophagus, liver, bile duct and pancreas examined. The intestines were cut into six inch lengths. A glass nozzle rubber tube conveying water under the pressure of gravity was inserted into one end of the segment, and its contents flushed on to a cheese cloth stretched over a frame. The frame divided the cheese cloth into squares, so that the contents of the various segments were segregated. Water was poured over the specimens, rinsing them, and with the aid of a dissecting microscope they were removed, placed in Zenker's fixing reagent, and later transferred to vials containing seventy per cent alcohol. In addition the intestines were cut open longitudinally and examined under the microscope.

In conclusion the writers of this paper wish to state that this is merely a preliminary report contributing to the 1937 annual report of the work in progress at Kent's Island. A complete paper awaits the identification of specimens by specialists of the United States Department of Agriculture.

Much more work is indicated to clarify the relations of the food of the gull to the life cycles of its parasites. As an instance, the larvae of certain Acanthocephalids are known to live in isopods and the worms themselves in marine fish. In one of the forty-four gulls examined, isopods were found, in another Acanthocephalids belonging to the genus Fillicollis apparently F. sphaerocephalus according to Dr. Chitwood.

BIRD SONG RECORDING

One of the unique projects attempted at Kent's Island is the recording of bird songs by means of radio. The recordings were made possible by the cooperation of Mr. Albert R. Brand of the Laboratory of Ornithology, Cornell University, Ithaca, New York.

Since it was impracticable to transport the heavy Ford sound truck to Kent's Island, it was driven to Eastport thence carried by steamship to Grand Manan, the nearest accessible point to Kent's Island. From Kent's Island the bird songs were transmitted by the Station's short wave radio and picked up by the sound truck stationed at Seal Cove, Grand Manan, eight miles distant.

To the pet raven "Croaky" goes the distinction of being the first bird to transmit his harsh sonorous voice over the air to be permanently recorded. Calls from the gull colony nearly a mile away were also picked up with the aid of a parabolic reflector.

The recordings of the petrel presented a more difficult problem. It was necessary to set up a sensitive microphone very near the burrows of the nesting colony. The petrel utters its song at very uncertain and irregular intervals. The best performances are given only at night between ten in the evening and three o'clock in the morning. Furthermore, the birds are most active when the island is enshrouded in a dense fog. From the microphone the voice of the birds was run through a field amplifier constructed by Mr. Paul Kellogg of Cornell University. From the amplifier it was continued through an insulated cable to the radio station a quarter of a mile away. The difficulties to prevent extraneous sounds and so called "feed back" taxed the skill and ingenuity of the radio department. On the nights when the recordings were made the dew was so heavy that the cable extending through the wet grass was saturated with water accentuating the transmission difficulties.

One of the most difficult problems was the lack of adequate communication facilities between the field party, the radio building on Kent's Island and the sound truck on Grand Manan. In spite of these handicaps and seemingly insurmountable difficulties Mr. Brand through his enthusiasm and skillful leadership made this first attempt at recording bird songs by radio a success. Records have been completed and it is now possible for the ornithologist to hear the wierd sea calls of the petrel without traveling to the distant outpost sea island.

It is hoped that through the lessons learned from this first attempt and by improved facilities of communication and important additions to the Kent's Island transmission equipment, even better results may be obtained in the future.

RADIO

(by Thomas A. Gross, W1JZM)

Radio plays a very important part in the expedition's activities because not only does it provide the station with the only satisfactory means of communication, but its work extends into other fields as well.

The radio station is licensed under the call VE1IN. It has unlimited privileges for phone operation in the amateur bands.

The transmitter is powered by a 2 K.V.A. 60 cycle 115 volt gasoline motor driven generator. A 40 volt bank of storage batteries is floated across the exciter field for ballast purposes.

The plant is located about 200 feet from the transmitting house and is connected by a 500 pound armoured 8 gauge cable. The plant is small for the purpose for which it is used and care has to be taken to improve the regulation as much as possible. The batteries and the heavy duty cable give material aid but it is found very important that the power factor be corrected as much as possible. To this end a 100 mfd. condenser was connected across the AC line.

The power convertors for the transmitter are the usual transformer rectifier filter systems. Large filters with swinging input reactors are used to provide good regulation. The total hum content of the carrier with modulator and speech amplifier on, but the microphones disconnected, is lower than .2 of 1% by the use of trick filters and application of the inverse feedback principle.

The radio frequency section of the transmitter is designed with very high efficiencies and good linearity of the modulated stage in view. A two tube exciter is used which furnishes up to 200 watts to a pushpull class C Modulated final amplifier. This final amplifier would be capable of 3000 watts power should the power plant and regulations permit. The plate voltage to this stage is 2200. Experiments were made using more than 4000 volts but although even greater efficiencies resulted the 2200 volts is used because it more nearly suited the L/C ratios of the amplifier and the available impedences of the modulation transformer. At 2200 volts the efficiency of the amplifier is the very high figure of 85% on phone. The simplicity of the transmitter is very unusual since the radio frequency section consisted of three stages using four tubes.

The modulator is particularly fine. It is capable of excellent fidelity even when completely modulating the transmitter at high power. The speech amplifier and the modulator which were designed by the writer consists of eight stages terminated by a pair of 805s driven by Western Electric 300As. The speech amplifier uses special filters for high "Intelligibility efficiencies". Experi-

ments last summer with high pass filters and resonant equalizers using the primaries of bell and filament transformers as chokes gave success. Equalization was found particularly desirable with velocity operated microphones. Even crystal types with response peaked for voice frequencies required definite low frequency attenuation in order that greatest intelligibility would obtain.

Tone equalization was attempted by inserting either inductive or capacitative reactances in the negative feedback return leads. While it was found that it is a simple matter to improve low frequency response in this manner, difficulty was found in finding proper chokes to attenuate the low frequencies. R.F. negative feedback was tried but the results were not completely satisfactory because of the presence of phase shifts.

The most baffling problem that existed for some time was filament voltage control. A General Radio "Variac" together with an automatic line ballast having a positive temperature characteristic controlled by the "Send-Receive" switch finally solved the problem.

The transmitting antenna is a 1/2 wave hertz, which was frequently recut for the particular frequency used. It was fed by a low impedance untuned line. A strong third harmonic which was disrupting commercial services was eliminated by a low pass filter inserted between this line and the link to the final amplifier tank.

The antenna was located so that a directional effect would be realized in Eastern United States and incidently to countries in Northern Europe via a great circle path. A number of reports indicating strong signals on all frequencies used, down to 3.5 megacycles, have come from these countries.

George Cadman, W2FEF, was in charge of communications. A very competent operator, Cadman transmitted many hundreds of messages. VELIN was the only station that was able to maintain regular schedules with WHFN of the MacMillan Expedition during the summer.

The bird recording was the first job the radio staff undertook outside of our regular routine of operating, repairing and improving the transmitter. As to be expected the longitudinal interference pickup from the 1/4 mile length of cable was tremendous. Various kinds of RF filters, bucking and negative feedback arrangements were tried without a complete elimination of the pickup. Objectionable background noise was reduced at the time of the recording to the discs by a 400 cycle high-pass filter.

Soon after the recording the writer found that longitudinal interference could be greatly reduced if the input stage of the speech amplifier used a pentode with certain modifications. The results of this development are described in the December 1937 QST (Page 33).

Fred Crystal, W2JKE, of our radio staff was stationed at Grand Manan equipped with the recording apparatus, receiver, and a small CW battery operated transmitter. The latter was used for communication purposes. Mr. Crystal's abilities both as an operator and technician aided our work materially.

Our most dramatic undertaking was the broadcast relayed over the Blue network of the National Broadcasting Company which was scheduled December 30th during our trip to Kent's Island this past winter. Murry Litchfield, W1KJU, and myself composed the staff at this time. Only thirty hours were available to prepare the transmitter and power generating apparatus for the broadcast. Special coils, antennae, and whole stages had to be either changed or added to the transmitting equipment. Seventy-five meter crystals had to be ground down to the 63 meter wave-length with scouring powder, the power-plant needed new brushes, antenna masts, heavily guyed for strong winds had to be erected on frozen ground, the 500 lb. cable had to be installed; all of this to be done within 30 hours! A few minutes before the scheduled time the transmitter was on the air with everything working properly except the mercury vapor rectifiers which had to be heated by a blow torch.

NBC reported the signal as excellent and plan to rebroadcast more programs next summer.

During the winter time a 1 1/4 watt phone transmitting station is operated by Mr. Joy, the station's winter observer. Called "Little IN" by amateur operators for miles around, this station provides Mr. Joy with his only communication with the outside world during the winter months. A wind driven generator provides the power for the receiving and transmitting apparatus.

Next summer plans are even more ambitious than previously. The entire station is being rebuilt so that greater reliability and safety will be had. The Kenyon Transformer Company is co-operating with us by supplying transformers for this new equipment. A new antenna will be installed using a concentric line feeder and two seventy foot masts. The main operating frequency will probably be 14,285 kilocycles instead of the usual 3885 kc. frequency used last summer in view of the expected poor conditions on the latter frequency. Special events will be handled on 4797.5 kc. The boat will be installed with a modern 15 watt phone transmitter and a receiver. The main station will use a RME-69 receiver with a DB-20 preselector. This fine receiving unit was given by the Radio Mfg. Engineers Inc. It is very important that the station be equipped with measuring equipment. An oscilloscope must be obtained to serve as a modulation monitor and to analyze circuit troubles. Automatic relay control devices will be installed to protect the equipment and add to convenience in operation.

We are indebted to the following manufacturers who have co-operated with our department by extending generous discounts and contributions. We find their products very satisfactory under the severe service they render on our expedition.

Centralab
Astatic Microphone Labs.
Barker & Williamson
Bassett Research Corp.
Belden Mfg. Corp.
Bell Telephone Labs. (Mr. Long)
Bruno Laboratories, Inc.
Burgess Battery Company
Burton-Rogers Company
C & S Xtals
General Cable Corp.
General Radio Co. (Mr. H. S. Shaw)
Kenrad Tube and Lamp Corporation
Kenyon Transformer Co., Inc.
P. R. Mallory Inc.
Radio Mfg. Engineers, Inc.
Solar Mfg. Corporation
Taylor Tubes Inc.
Triplett Electrical Instrument Co.
Lenz Mfg. Company

BIRD BANDING 1937
(by Nahum R. Pillsbury Jr.)

As in past years bird banding was given an important place on the program at Kent's Island. During the summer of 1937 Mr. Nahum R. Pillsbury was in charge of the banding of gulls and Mr. William Valencourt of Carleton College, Northfield, Minn. concentrated his activities on banding of land birds.

The interest in the banding of Herring Gulls has been given great impetus by the Co-operative Gull Banding Project sponsored by the Linnean Society of New York. Professor Alfred O. Gross of Bowdoin College is chairman of the Committee which has charge of the work. In this new project nine of the largest colonies of Herring Gulls in Eastern United States and Canada were selected. In order to facilitate the identification of the gulls of the different colonies by field observers, colored celluloid bands were used in addition to the numbered aluminum Biological Survey bands. A color combination was allotted to each of the colonies. The one used at Kent's Island was a red celluloid band placed beneath the aluminum band. In the case of adults a black band was placed on the other leg.

Mr. Pillsbury and his assistants banded 4851 gulls on Kent's Island and of this number 2,350 were marked with the additional red bands. Unfortunately the second allotment of celluloid bands was not received from the Biological Survey in time to include all of the gulls banded. Of the 2,350 marked with red bands two

hundred were adults. Incidentally five of the adults captured were banded as young at Kent's Island. The old numbers were removed and replaced with new bands as follows, -

Old band Number	Date banded	Date rebanded	New Number
35-556005	Aug. 26, 1935	Aug. 27, 1937	37-657106
35-556028	Aug. 26, 1935	Aug. 27, 1937	37-657191
35-556056	Aug. 26, 1935	Aug. 27, 1937	37-657119
35-557917	July 25, 1936	Aug. 27, 1937	37-657148
35-557970	July 25, 1936	Aug. 27, 1937	37-657162

The above records are of interest since they provide evidence that some of the birds return to the colony of their birth. It is recommended a greater attempt be made in the future to band the adult gulls since less is known of their migratory movements than we know of the immature birds. At Kent's Island the capture of adults has been accomplished by "jacking" with flash lights on foggy nights. This method has not proven satisfactory because of great personal inconvenience and our inability to secure large numbers of the adult gulls. It is suggested that large traps about 20' x 15' x 8' in dimensions be constructed in the midst of the colony to facilitate this important work.

The population of young gulls on Kent's Island and especially on the surrounding islands was much less in 1937 than it has been in previous years. One apparent factor in this decrease is the recent legalizing of egging by the Canadian Government. The Station has not permitted egging on the southern end, the main part of the gull colony, on Kent's Island.

The following accepted sight recoveries of gulls banded at Kent's Island (identified by the presense of the red band beneath the Survey band) have been reported to date January 1, 1938.

Month	State	Number of birds reported
September	Maine	6
October	Maine	1
	New Hampshire	1
	New York	10
November	New Hampshire	1
	Massachusetts	1
	Rhode Island	1
	Connecticut	4
	New York	14
	New Jersey	2
December	Connecticut	1
	New York	27
	Total	69

One adult Kent's Island gull was observed in New Jersey by G. A. Cadbury on November 21 and another by A. H. Durow at the Fulton Fish Market, New York City on December 15, 1937.

The following 280 recoveries are of gulls banded at Kent's Island and not previously reported in the Station Bulletins. It includes gulls banded by Burton Whitman and Fred Fisher at Kent's Island in 1934 and 1935. These were not available for the previous reports. Fifty-nine recoveries were reported in the 1936 Bulletin and ninety-nine in the 1937 Bulletin. These with the 280 being reported in this issue makes a total of 438 recoveries of gulls since the Bowdoin Scientific Station has been in operation. Up to the time of writing, February 1, 1938, we have received thirteen recoveries of birds banded in 1937.

The following number of gulls have been banded at Kent's Island and neighboring islands since work was started.

Whitman and Fisher	1934-35	2,248
John Crystal	1935	6,804
John Crystal	1936	8,000
Nahum Pillsbury	1937	4,851

Of the 17,152 gulls banded from 1934 to 1936 inclusive we have obtained 425 recoveries of birds marked with Biological Survey bands. This makes an average return of 2.47 per cent or approximately 25 recoveries for every thousand birds banded.

RECOVERIES OF HERRING GULLS BANDED AT KENT'S ISLAND

Number	Banded	Recovered	Place of recovery	How recovered
B-216731		1-30-35	Deer Island, N.B.	Found dead
B-614278	7-21-34	12-9-34	Galveston Bay, Tex.	Found dead
B-624521	7-21-34	1-10-35	Willis Wharf, Vir.	Found dead
B-624594	7-21-34	4-1-35	Manteo, N.C.	Found dead
B-624673	7-22-34	12-1-34	Staten Island, N.Y.	Shot
B-624694	7-22-34	11-29-34	Thibodeaux, La.	Caught
B-624887	7-25-34	1-9-35	Sea Island, Georgia	Caught
B-624936	7-25-34	3-26-35	Tampico, Mexico	Captured & released
B-624954	7-25-34	10-6-34	Back Bay, N.B.	Found dead
34-516007	7-20-34	8-25-34	Cutler, Maine	Found dead
34-516063	7-25-34	12-25-34	Southfort, N.C.	Found dead
34-516153	7-25-34	10-18-34	Marbeque, P.E.I.	Caught
34-516244	7-25-34	2-10-34	Donaldsonville, La.	Found dead
34-516246	7-23-34	12-4-35	Little River, Nova Sc.	Shot
34-516309	7-29-34	12-15-34	Coronado Beach, Flor.	Found dead
34-516398	7-29-34	10-25-34	Grand Manan, N.B.	Found dead
34-516462	8-12-34	11-6-34	Newport News, Vir.	Killed by car
34-516472	8-12-34	2-20-35	Ferdandina, Flor.	Found dead

34-516493	8-12-34	11-7-34	Cayman Brac, Jamaica	Shot
34-542039	8-12-34	1-6-35	Canso, Nova Scotia	Shot
34-542044	8-12-34	10-3-34	Cape Sable, Nova Sc.	Found dead
34-542064	8-12-34	1-16-35	Galveston, Texas	Found dead
34-542087	8-12-34	12-6-34	Baltimore, Md.	Found dead
34-542171	8-12-34	3-22-35	James River, Va.	Found injured-killed
34-542348	8-12-34	12-16-34	Torresdale, Penn.	Found dead
34-542349	8-12-34	2-20-35	Coast of New Berne, NC.	Choked to death
34-542379	8-13-34	3-1-35	Bayon La Batre, Ala.	Crippled
34-542536	8-13-34	11-10-34	Pigeon Point, Del.	Found dead
34-542723	8-13-34	2-22-35	Pahopee, Florida	Captured & released
34-542888	8-13-34	11-5-34	Ipswich, Mass.	Found dead
34-543054	8-27-34	2-10-35	Biloxi, Miss.	Broken wing
34-543311	8-27-34	1-19-35	Vera Cruz, Mexico	Shot
34-543355	8-27-34	12-1-34	Hampton, Virginia	Found dead
34-543388	8-27-34	2-14-35	Daytona Beach, Fla.	Found wounded
34-543401	8-27-34	2-3-35	Melbourne, Fla.	No information
34-543438	8-27-34	12-23-34	Watch Hill, R.I.	Remains found
34-543458	8-27-34	11-20-34	St. Louis, N.B.	Caught-Gill net
34-543459	8-27-34	12-24-34	Naragansett Bay, R.I.	Remains found
34-543624	8-27-34	7-20-36	Grand Manan, N.B.	Found dead
34-543624	8-27-34	3-21-35	Pambico Sound, N.C.	Caught & released
34-543710	8-27-34	11-5-34	Seaside Park, N.J.	Found dead
34-543777	8-27-34	12-9-34	East Pass, Fla.	No information
34-543829	8-27-34	12-25-34	Deltaville, Va.	Found injured, killed.
34-543943	8-27-34	10-30-34	Wilmington, Del.	Found dead
34-543957	8-27-34	3-23-35	Apalachicola, Fla.	No information
34-628031	7-30-34	2-24-35	Jacksonville, Fla.	Found dead
34-628090	7-30-34	11-18-34	Yonkers, N.Y.	Found dead
34-628109	7-30-34	3-24-35	Biloxi, Miss.	Broken wing
34-628148	7-30-34	2-3-35	Melbourne, Fla.	No information
34-628121	7-30-34	11-29-34	St. George, Georgia	Found dead
34-628188	7-30-34	10-21-34	Atlantic City, N.J.	Captured
34-628354	8-1-34	10-15-34	Nansemond Co., Va.	Found dead
34-628377	8-1-34	11-29-34	Pt. Arthur, Texas	Found dead
34-628387	8-1-34	8-29-37	Kent's I., N.B.	Found dead
34-628391	8-1-34	11-9-34	Phila., Penn.	Remains found
34-628446	8-14-34	11-11-34	Wabasso, Fla.	Found dead
35-528045	8-11-35	7-20-36	Grand Manan, N.B.	Found dead
35-529250	8-6-35	55-5-36	Savannah, Ga.	Found dead
35-530174	8-7-35	7-20-36	Grand Manan, N.B.	Found dead
35-530883	6-7-35	7-20-36	Grand Manan, N.B.	Found dead
35-548232	8-1-35	fall 1936	Neptune, N.J.	Found injured
35-548276	8-1-35	4-36	Norwalk, Conn.	Found dead
35-548328	8-1-35	1-14-37	Staten I. N.Y.	Found dead
35-548487	8-1-35	1-1-37	Jordan Bay, N.S.	Found dead
35-548488	8-1-35	-35	Brooklyn, N.Y.	Found dead
35-548830	8-1-35	3-18-37	Bridgeport, Conn.	Found dead

35-549149	7-22-35	3-18-37	St.Petersburg,Fla.	Found
35-549196	7-22-35	3-9-37	Westport, N.S.	Found wounded
35-549230	7-22-35	11-35	Cordele, Ga.	Shot
35-549321	7-22-35	5-4-37	Norfolk, Va.	Found dead
35-549362	7-22-35	11-1-36	Montauk Point, L.I.N.Y.	Found dead
35-549551	7-22-35	5-24-37	Leesburg, La.	Found dead
35-549596	7-22-35	10-12-36	Boston, Mass.	Found injured
35-549635	7-22-35	7-20-36	Grand Manan, N.B.	Found dead
35-549681	7-22-35	4-2-37	Campobello I. N.B.	Found
35-550141	8-10-35	7-20-37	Nantucket, Mass.	Found dead
35-550254	8-10-35	5-20-37	Riverhead, L.I.N.Y.	Found dead
35-550458	8-10-35	6-6-37	Norwalk, Conn.	Found dead
35-550594	8-10-35	1-19-37	No information	
35-551115	8-10-35	1-21-37	Block Island, R.I.	Found dead
35-551386	8-1-35	9-15-36	Wildwood Crest, N.J.	Found dead
35-551610	8-1-35	7-17-37	Montauk, L.I. N.Y.	Caught in fish net
35-552378	7-27-35	12-21-36	Greenport, L.I. N.Y.	Found dead
35-552494	7-29-35	2-12-37	Barrington Beach,R.I.	Found dead
35-552618	7-29-35	4-20-37	Brooklyn, N.Y.	Found
35-552657	7-29-35	4-7-37	Sylvester, N.S.	Found crippled
35-552746	7-29-35	11-10-36	Galveston, Texas	Killed by auto
35-552877	8-25-35	2-15-37	East Moriches, N.Y.	Found dead
35-552902	7-30-35	10-26-36	Nahant, Mass.	Found injured
35-552919	7-30-35	8-27-37	St.Margaret's Bay,N.S.	Found dead
35-552985	7-30-35	7-17-37	Karsdale, N.S.	Caught and released
35-555632	8-25-35	6-6-37	Marblehead, Mass.	Found dead
35-555887	8-25-35	1-17-37	No information	
35-556005	8-26-35	8-27-37	Kent's Island,N.B.	Captured and released
35-556028	8-26-35	8-27-37	Kent's Island, N.B.	Capt.& released
35-556056	8-27-35	8-27-37	Kent's Island, N.B.	Capt. & released
35-556087	8-27-35	9-36	So.Dartmouth, Mass.	Found dead
35-556262	8-27-35	9-36	Oak I., L.I., N.Y.	Found dead
35-556275	8-27-35	11-10-36	Smithfield, R.I.	Band found in fox den
35-556653	8-27-35	7-12-36	Kent's Island, N.B.	Found dead
35-556736	8-27-35	8-16-36	Kent's Island, N.B.	Found sick
35-556764	8-27-35	8-16-36	Kent's Island, N.B.	Found sick
35-556822	8-29-35	12-21-36	Bronx, N.Y.	Found dead
35-557784	7-28-36	10-28-36	Stamford, Conn.	Found dead
35-557917	7-25-36	8-27-37	Kent's Island, N.B.	Capt.& released
35-557970	7-25-36	8-27-37	Kent's Island, N.B.	Capt. & released
36-641091		3-28-37	Savannah, Ga.	Found dead
36-641302		8-3-37	Manomet, Mass.	Found dead
36-641417		3-18-37	Port St. Joseph, Fla.	Found dead
36-641423	7-22-36	4-19-37	Beaufort, N.C.	Found dead
36-641440	8-28-36	3-20-37	Annapolis, Maryland	Found injured
36-641464	7-22-36	5-3-37	No information	
36-641481	8-28-36	9-10-36	Middle Caraquet,N.B.	Caught
36-641526	7-27-36	3-25-37	Georgetown, S.C.	Found dead, starved.

36-641556	7-22-36	8-11-37	Prospect Harbor, Maine	Found dead
36-641557	7-22-36	7-10-37	Charleston, S.C.	Found dead
36-641580	7-22-36	8-12-37	No information	
36-641676	7-27-36	3-5-37	Johnson's Bayou, La.	Caught
36-641686	7-27-36	9-16-36	Lubec, Maine	Found dead
36-641748	7-27-36	12-26-36	Bayou Current, La.	Found sick or injured
36-641762	7-27-36	1-4-37	Galveston, Texas	Capt. & released
36-641782	7-27-36	1-19-37	Seadrift, Texas	Found dead
36-641849	7-27-36	2-6-37	Galveston, Texas	Caught on fish line
36-641854	7-27-36	8-12-37	Moriches Inlet, L.I.N.Y.	Found dead
36-641870	7-27-36	9-15-36	Francois, Newfoundland	Shot
36-641882	7-27-36	1-18-37	Carrabelle, Fla.	Fell down chimney
36-641902	7-27-36	10-20-36	Grande Anse, N.B.	Shot
36-641919	7-27-36	4-21-37	Terence Bay, N.S.	Picked up
36-641926	7-27-36	2-1-37	Daufuskie Is. S.C.	Found dead
36-641970	7-27-36	8-10-37	Jones Beach, L.I.N.Y.	Found dead
36-641997	7-27-36	8-9-37	Staten Island, N.Y.	Found dead
36-642037	7-26-36	11-14-36	Austwell, Texas	Found dead
36-642106	7-26-36	8-17-37	Harrington, Maine	Found dead
36-642108	7-26-36	9-17-37	Starboard, Maine.	Found injured, killed
36-642122	7-26-36	10-13-36	Halifax, N.S.	Found dead
36-642176	7-26-36	8-30-37	Bogalusa, La.	Killed
36-642179	7-26-36	2-7-37	Tampico, Tamanlipas, Mex.	Found injured
36-642184	7-26-36	1-6-37	New Orleans, La.	Found injured, died
36-642232	7-22-36	2-28-37	Matamoros, Tamanlipas, Mex.	Captured
36-642244	7-26-36	4-10-37	Rockaway Point, N.Y.	Found dead
36-642307	7-26-36	5-26-37	Galveston, Texas	Found dead
36-642374	7-26-36	9-20-37	Essex, Conn.	Found dead
36-642401	7-26-36	9-9-36	Recontre, Newfoundland	Shot
36-642403	7-26-36	3-1-37	High Island, Texas	Caught in trap
36-642438	7-26-36	9-10-37	W. Hyannis, Mass.	Found dead
36-642514	7-26-36	2-24-37	Corpus Christi, Tex.	Caught on fish hook
36-642524	7-26-36	3-8-37	Brownsville, Texas	Found dead
36-642560	7-26-36	11-5-36	Lawrence, L.I., N.Y.	Found dead
36-642697	7-26-36	6-23-37	Perth Amboy, N.J.	Caught
36-642775	7-26-36	12-19-36	New Orleans, La.	Found dead
36-642796	7-26-36	10-4-36	Lambertville, N.B.	Found injured
36-642857	7-26-36		New Orleans, La.	Caught
36-642925	7-26-36	11-13-36	Core Sound, N.C.	Caught
36-642929	7-26-36	1-11-37	Luling, La.	Floating in river
36-643026	7-26-36	7-10-37	Barnegate Light, N.J.	Found dead
36-643105	7-26-36	1-25-37	Calhoun Co., Texas	Captured
36-643107	7-26-36	12-29-36	Morehead City, N.C.	Found dead
36-643179	7-26-36	4-10-37	Hatteras, N.C.	Found dead
36-643237	7-26-36	5-26-37	Little Compton, R.I.	Found dead
36-643315	7-26-36	2-19-37	Orange, Texas	Capt. & released
36-643344	7-26-36	9-1-37	No information	

36-643431	7-26-36	3-1-37	Burton, S.C.	Found dead
36-643461	7-26-36	5-24-37	Jones Beach, L.I., N.Y.	Found dead
36-643483	7-26-36	2-8-37	Tarpon Springs, Fla.	Found dead
36-643530	7-26-36	2-15-37	Ocracoke, N.C.	Caught in net
36-643710	7-26-36	11-22-36	Croton-on-Hudson, N.Y.	Found sick, died
36-643750	7-26-36	2-4-37	Carrabelle, Fla.	Capt. & released
36-643756	7-26-36	7-26-37	Briar Island, N.S.	Found dead
36-643781	7-26-36		Salisbury, N.C.	Collected as specimen
36-643786	7-26-36	2-5-37	Galveston, Texas	Found in oil, died
36-643932	7-26-36	5-22-37	East Hampton, L.I., N.Y.	Found dead
36-643947	7-26-36	5-8-37	Ville Platte, La.	"Taken"
36-643961	7-26-36	2-8-37	New Bern, N.C.	Found dead
36-643969	7-26-36	1-6-36	New Orleans, La.	Found dead
36-644027	7-30-36	10-16-36	Little Neck, N.Y.	Found dead
36-644043	7-30-36	1-25-37	St. Andrews, Fla.	Captured
36-644070	7-30-36	3-4-37	Georgetown, S.C.	Found dead, starved
36-644095	7-26-36	4-7-37	Atlantic Highlands, N.J.	Found dead
36-644123	7-30-36	2-20-37	Terrebonne Parish, La.	Found dead
36-644264	7-30-36	10-2-36	Portaux Basque, Nfld.	Shot
36-644327	7-30-36	1-31-37	House Shoe Bayou, La.	Caught
36-644340	7-30-36	10-24-36	W. Jonesport, Maine	Found dead
36-644368	7-30-36	2-14-37	Placeds Junction, Va.	Broken wing
36-644377	7-30-36	1-29-37	West Palm Beach, Fla.	Killed by truck
36-644463	7-30-36	5-15-37	Taft, Texas	"Band removed"
36-644470	7-30-36	9-15-36	Francois, Nfld.	Shot
36-644586	7-30-36	1-4-37	Pensacola, Fla.	No information
36-644679	7-30-36	1-28-37	St. Bernard, La.	Caught in trap
36-644720	7-30-36	3-26-37	Norfolk, Va.	Found dead, shot
36-644796	7-30-36	11-1-36	Brooklyn, N.Y.	Killed by airplane
36-644821	7-30-36	2-25-37	Morehead City, N.C.	Found dead
36-644824	7-30-36	12-11-36	Altamaha, Ga.	Killed
36-644833	7-30-36	8-13-37	Yarmouth, N.S.	Trapped in scow
36-644905	7-30-36	1-5-37	Pascagoula, Miss.	Collected as specimen
36-644936	7-30-36	1-30-37	New Orleans, La.	Broken wing
36-645018	7-30-36	4-11-37	Margati, N.J.	Found dead
36-645038	7-30-36	9-13-37	Gloucester, Mass.	Found dead
36-645157	7-30-36	2-15-37	Fernandina, Fla.	Capt. & released
36-645166	7-30-36	10-12-36	Nantucket, Mass.	Found dead
36-645191	7-30-36	1-8-37	Long Branch, N.J.	Caught on fish line
36-645288	7-30-36	1-8-37	Live Oak Point, Tex.	Found sick
36-645301	8-3-36	1-10-37	Mobile, Ala.	Found injured
36-645365	8-3-36	10-12-36	Tormentine, N.B.	Found dead
36-645488	8-3-36	3-24-37	Beaufort, N.C.	Capt. & released
36-645489	8-3-36	6-30-37	Staten Island, N.Y.	Killed
36-645490	8-3-36	9-10-37	Millbridge, Maine	Found dead
36-645493	8-3-36	7-25-37	Newport, R.I.	Found dead
36-645553	8-3-36	1-10-37	Belmar, N.J.	Found dead

36-645560	8-3-36	9-7-37	Paulsboro, N.J.	Found dead
36-645616	8-3-36	9-17-37	Upper Nyack, N.Y.	Found dead
36-645754	8-3-36	1-1-37	Demopolis, Ala.	Found dead
36-645756	8-3-36	2-13-37	Texas City, Tex.	Found dead
36-645758	8-3-36	2-19-37	Lemon Park, Fla.	Caught in trap
36-645761	8-3-36	3-25-37	Vera Cruz, Mexico	Killed
36-645782	8-3-36	4-11-37	Gulfport, Miss.	Found dead
36-645783	8-3-36	9-24-36	Petites, N.S.	Found
36-645794	8-3-36	5-29-37	Sandy Neck, Cape Cod, Mass.	Found dead
36-645890	8-3-36	6-29-37	Anapolis, N.S.	Found injured
36-645934	8-3-36	2-19-37	Lake Harbor, Fla.	"Taken"
36-645957	8-3-36	2-28-37	Corpus Christi, Tex.	Oil soaked
36-645990	8-3-36	1-9-37	Dauphin Island, Ala.	Broken wing
36-646013	8-3-36	3-1-37	Golden Meadow, La.	Found dead
36-646022	8-3-36	1-37	Mobile, Ala.	Caught in trap
36-646222	8-6-36	9-5-36	Eastport, Maine	Found dead
36-646259	8-6-36	11-4-36	Kecaughton, Va.	Found dead
36-646314	8-10-36	1-9-37	At sea off Carrabelle, Fla.	"Taken"
36-646403	8-10-36	1-5-37	Grand Chenier, La.	Dead in trap
36-646448	8-10-36	11-1136	Newport, R.I.	Caught and released
36-646458	8-10-36	12-15-36	Mobile Bay, Ala.	Found dead
36-646723	8-10-36	2-11-37	Pass Christian, Miss.	Recovered
36-646743	8-10-36	6-17-37	Waverly, Ga.	Found
36-646914	8-10-36	8-23-37	Hebron, N.S.	Found dead
36-646953	8-10-36	1-24-37	Galveston, Tex.	No information
36-647057	8-11-36	2-20-37	Portsmouth, Va.	Found dead
36-647140	8-11-36	9-11-37	City Island, N.Y.	Found dead
36-647163	8-11-36	3-24-37	E. Keansburg, N.J.	Found dead
36-647323	8-11-36	2-9-37	Corpus Christi, Tex.	Found dead, shot
36-647328	8-11-36	1-2-37	Severn, Va.	No information
36-647391	8-11-36	2-16-37	Gloucester, mass.	Found dead
36-647435	8-11-36	8-10-37	Belfast, Maine	Found dead
36-647485	8-11-36	10-26-36	Bath, Maine	Found dead
36-647529	8-11-36	1-5-37	N. Birmingham, Ala.	Killed
36-647567	8-11-36	2-21-37	Berwick, La.	Caught on fish line
36-647600	8-11-36	2-16-37	Corpus Christi, Tex.	No information
36-647626	8-11-36	9-8-37	Southport, Maine	Found dead
36-647648	8-11-36	5-12-37	Gulfport, Miss.	Found dead
36-647809	8-11-36	8-11-37	Marblehead, Mass.	Found dead
36-647813	8-11-36	11-22-36	Yorktown, Va.	Found leg
36-647854	8-11-36	1-17-37	Ocean Springs, Miss.	Found wounded
36-648042	8-13-36	6-13-37	W. Galveston Bay, Tex.	Found dead
36-648130	8-13-37	11-13-37	Aboard ship Lat. 46° 30' Long. 14° W	Alive, died next day
36-648154	8-13-36	12-19-36	Mobile, Ala.	Found floating in bay
36-648206	8-13-36	10-31-36	Fox Hill, Va.	Found dead
36-648238	8-13-36	2-18-37	Port Sulphur, La.	Found dead
36-648251	8-13-36	1-5-37	New Orleans, La.	Caught in trap
36-648287	8-13-36	12-13-36	Cedar Key, Fla.	Caught
36-648514	8-12-36	7-10-37	Westbrook, Maine	Shot

36-648563	8-12-36	2-16-37	Salem, N.J.	Found dead
36-648647	8-12-36	3-3-37	Aransas Pass, Tex.	Caught on boat
36-648686	8-12-36	8-24-37	Seal Island, Maine	Found dead
36-648834	8-13-36	12-3-36	Montgomery, Ala.	Killed
36-648886	8-13-36	2-22-37	Pensacola, Fla.	Found dead
36-648896	8-13-36	5-8-37	Brant Beach, N.J.	Found dead
36-648941	8-13-36	3-15-37	S. Thomaston, Maine	Found dead
36-650031	6-27-37	9-12-37	Millbridge, Maine	Found dead in weir
37-653151	7-10-37	12-24-37	Tela, Honduras	Caught and released
37-653593	7-11-37	9-24-37	Grand Manan, N.B.	Found dead
37-653900	7-12-37	9-17-37	Campobello, N.B.	Found dead
37-654207	7-12-37	9-17-37	Beaver Harbor, N.B.	Found dead
37-654896	7-18-37	9-5-37	Milltown, N.B.	Capt. & released
37-654915	7-18-37	9-24-37	Prospect Harbor, Me.	Found dead
37-655017	7-18-37	9-10-37	Beaver Harbor, N.B.	Found dead
37-655368	7-19-37	9-10-37	Dipper Harbor West, N.B.	Captured and released
37-655487	7-19-37	8-29-37	Big Duck Island, N.B.	Found sick, died
37-655643	7-20-37	12-13-37	Havana, Cuba	Caught near Tortuga Key
37-656735	7-21-37	8-14-37	Kent's Island, N.B.	Found dead
37-657100	8-6-37	8-19-37	Outer Wood Island, N.B.	Found dead
37-657618	8-28-37	9-18-37	St. John, N.B.	Found dead

(Editor's note. Since the above list was compiled 48 additional records have been received from the United States Biological Survey and numerous sight records of Kent's Island gulls marked with red bands have been reported. These will be included in the next ANNUAL REPORT.)

A large map of North America showing the exact location of each gull recovery is being prepared. This will greatly aid the reader in visualizing the distribution of the recoveries.)

BANDING OF LAND BIRDS AND SEA BIRDS OTHER THAN HERRING GULLS
(by William Valencourt, Carleton College, Northfield, Minn.)

The Station's banding operations for 1937 began on the 19th of June when an adult Barn Swallow flew against a window pane in the dormitory and was captured. However, I began work in earnest on June 22nd when several nestlings of perching birds were banded.

A total of 192 birds of nine species other than gulls were banded during the summer. This represents an increase of 112 over the numbers banded during the preceding summer.

There are many species of small birds nesting on the island and it would be desirable if most of these could be banded during the

course of the summer. Since many of the nests are inaccessible, it would be necessary to bait these birds. It is hoped, therefore, that in the future there will be an appropriation which will enable the banding department to purchase the materials for a large number of small bird traps. A supply of burlap with which to make blinds would also be desirable.

The number of migrating shore birds which visit Kent's Island is tremendous. Some can be taken by means of flash lights without the use of traps. For the capture of others special traps will need to be designed. At any rate, these birds are numerous enough to warrant a large share of the banding department's attention and an effort should be made to tag as many as possible.

The following lists compare the banding operation (excluding gulls) of 1936 and 1937.

1936		1937	
Barn Swallow	42	Barn Swallow	65
Black Guillemot	13	Black Guillemot	10
Black-backed Gull	6	Black-poll'd Warbler	1
Razor-billed Auk	5	Leach's Petrel	28
Leach's Petrel	3	Robin	4
Robin	2	Savannah Sparrow	11
Spotted Sandpiper	2	Sparrow Hawk	1
Chimney Swift	1	Spotted Sandpiper	8
Cat Bird	1	Tree Swallow	64
Savannah Sparrow	1		
Tree Swallow	1		
Northern Water Thrush	1		
Black-billed Cuckoo	1		
Arctic Tern	1		
Total	80	Total	192

A tree Swallow Number H-15762 banded on Kent's Island by Mr. F. Burton Whitman on June 26, 1934 was killed by a cat at Western Shore, Lunenburg County, Nova Scotia on June 27, 1936. Reported by R.W. Tufts, Wolfville, Nova Scotia.

BIRD BANDING AT MACHIAS SEAL ISLAND

Dr. Clin S. Pettingill Jr., Instructor, Department of Zoology, Carleton College, Northfield, Minn. reports a total of 813 birds banded at Machias Seal Island as follows,-

Arctic Terns	588	Leach's Petrel	6
Atlantic Puffin	169	Cliff Swallow	1
Spotted Sandpiper	35	Savannah Sparrow	1
Barn Swallows	12	Red-breasted Nuthatch	1

Dr. Pettingill found five puffins which had been banded by F. Burton Whitman Jr. a member of the Kent's Island staff 1934-1935, as follows,-

34-542903	August 15, 1934	35-528915	July 23, 1935
35-528910	July 22, 1935	35-528917	July 23, 1935
35-528913	July 22, 1935		

Bands worn by birds that breed among sharp-edged, rough surfaced rocks and that are subject to alkaline waters do not withstand long wear. The Biological Survey has experimented on copper and monel metal but as yet nothing has been found entirely satisfactory.

A special puffin trap was devised by Dr. Pettingill which has proven very successful. The important banding work at Machias Seal Island will be continued.

METEOROLOGY

(by Robert M. Cunningham, Cambridge School)

The data gathered on the weather at Kent's Island give information about weather and climatic conditions on a well isolated small island. Conditions here offer an interesting study of the interaction of very warm moist continental air currents over a sea of small temperature range, typical of summer only. A permanent weather station at Kent's Island especially equipped for the study of the cold water type fog and accompanying phenomena should yield valuable results. With this goal in mind, special equipment has already been built.

Our work last summer, however, primarily pointed toward clarifying our needs in the way of special equipment for next summer. One piece of apparatus which seems desirable is a meterograph hitched to a captive balloon that may be raised and lowered a number of times a day. In this way it will be possible to keep track of the interesting inversion prevalent most of the summer over cold water. Another instrument which we constructed but did not permanently install was a fog precipitator. It consisted of a copper wire mesh screen one-meter square, set perpendicular to the front end of a vane so that fog would always blow through the screening, and drip into a container. In this way, for example, on September 11 between 3 P.M. and 8 P.M. three quarters of a gallon was collected, this quantity corresponding to .09 inches of rainfall. Such a fog precipitator tells approximately the water content of different fogs, and also gives some idea of the amount of fog water that is intercepted by the vegetation. We also plan to investigate continuously the chlorine content of the fog and rainfall. Moreover, we hope next summer to increase the accuracy and usefulness of the wind-direction and wind-velocity recordings by placing a recording anemometer and anemoscope on top of the administration building.

INSTRUMENTS IN USE IN 1937

The standard maximum and minimum thermometers are exposed in a regulation shelter placed on a wooden platform 2 1/2 feet above the high growing hay field. One shelter houses the thermograph and hygograph, and another houses the psychrometer close by. Next summer the shelters will all be placed on separate sets of legs, thus increasing the accuracy of the readings and more closely conforming to accepted standards. The rain gauge is fairly well exposed, three buildings and a wood surrounding it at distances far enough away to get an accurate catch. An instrument to measure evaporation was set up during the summer. Owing to the presence of a tame raven, which used it as a drinking station, it had to be enclosed with chicken wire, which somewhat affected its accuracy.

OBSERVATIONS

The highest temperature of the summer was 79, while Eastport, Maine., Yarmouth, Nova Scotia, Nantucket and Boston had a maxima respectively of 87, 84, 86, and 99.

The number of days with a maximum temperature of 70° or over during June, July, and August was 21, while Eastport, Nantucket, and Boston had 51, 66, and 80 days respectively. Most of our hot days came with winds from the northern quadrant, that is, they were days of generally clear weather with a wind from the continent. A southwest wind, in other sections a hot one, would almost invariably bring a cool fog over the island. Another striking trait of the summer marine climate of the Island is the frequency with which minimum temperatures close to fifty (which is about the water temperature) are recorded. To obtain an idea of the probably monthly mean temperature over a period of years the temperature departures from normal at Eastport and Yarmouth were averaged and applied to the Kent's Island mean temperatures for 1937. The following figures were obtained; January, 24.7; February, 25.7; March, 30.9; April, 39.2; May 45.0; June, 50.8; July, 55.8; August, 56.0; September, 55.2. These are probably not over 2° from the true normal for the Island. The lowest humidity of the summer occurred on September 8 at 4:20 p.m. when the hygograph registered 18%. Curiously enough, there were at the same time streaks of fog to the north with light variable winds. In June there were three thunder storms; in July, two; in August, three. On August 18 occurred "the worst thunder storm in years" in these regions. It lasted from 5:30 a.m. to 6:35 a.m., one bolt striking the Island near Crocket's Point.

NOTES ON DATA

Certain signs and abbreviations may need explanation. Parentheses are used to enclose figures that apply to more than one day. Also used in Monthly Mean to show data incomplete. An asterisk * shows

that the precipitation is included in the figure recorded for the next day. Wind velocities are given in the Beaufort scale. From January 1 to March 21 the following abbreviations were used for the sky observations: cl means clear; ov means cloudy; sl means sleet. Other abbreviations are according to the International usage, which after March 21 was used exclusively. Visibility is recorded according to this scale. A day was recorded as foggy when at the times of observation visibility was less than one-half mile. The number of days of fog recorded is therefore less than it would have been if each instance of less than one-half mile visibility had been counted. Observations are taken at 9 A.M. and 4 P.M. from January 1 to June 26 and September 16 to December 31. From June 27 to September 15 at 8:30 A.M., 2 P.M. and 8 P.M. All Atlantic Standard time (60th mer.)

MONTHLY METEOROLOGICAL SUMMARY FOR KENT'S ISLAND, N.B., CANADA.

Date	Temperature OF				Rel. Humidity %	Precip. inches	Wind Beaufort		Sky		Vic. 0-9	
	Max.	Min.	Mean	Range			9 a.m.	4 p.m.	9 a.m.	4 p.m.	9 a.m.	4 p.m.
January, 1937												
F 1	49	37	43	12	87	43	0	w 2	SW3	f-cl	2-9	
S 2	44	24	34	20	75	65	0	NE4	E 5	cl-ov	9-7	
S 3	44	29	36	15	84	100	.44	E 6	S 5	m-f	6-3	
M 4	49	33	41	16	66	71	0	NW3	W 4	cl-cl	8-7	
T 5	42	30	36	12	82	64	0	W 5	SW6	cl-cl	9-8	
W 6	41	17	29	24	69	77	0	N 5	N 3	cl-cl	9-9	
T 7	37	13	25	24	76	78	0	S 3	SW62	ov-ov	8-7	
F 8	41	31	36	10	83	74	.25	N 1	NW2	ov-ov	9-7	
S 9	44	33	38	11	81	93	0	S 4	W 5	f-f	3-3	
S 10	25	26	235	19	46	75	0	N 5	N 3	ov-cl	9-9	
M 11	27	15	21	12	80	85	0	N 3	NW2	cl-cl	9-9	
T 12	39	22	31	17	48	63	0	W 5	W 4	ov-cl	7-8	
W 13	43	34	38	9	83	65	0	W 5	NW3	cl-cl	8-9	
T 14	46	34	40	12	84	93	0	SE6	SW7	ov-f	7-5	
F 15	46	41	44	5	93	99	.46	SW3	NW2	r,f-ov	3-7	
S 16	42	23	33	19	76	-	0	NE4	N 4	ov-cl	8-9	
S 17	25	11	18	14	37	87	0	N 3	S 4	cl-ov	9-7	
M 18	47	25	36	22	93	99	.92	SW6	SW5	f-f	2-3	
T 19	43	36	40	7	64	65	0	NW4	N 5	cl-ov	9-7	
W 20	38	12	25	26	61	-	0	N 5	NE3	cl-cl	9-9	
T 21	40	15	27	25	72	60	0	SE6	W 6	sl-cl	5-9	
F 22	40	33-37	7	92	85		0	NW3	N1	ov-ov	7-7	
S 23	39	25	32	14	88	73	0	N 3	N 3	cl-cl	9-9	

Date	Temperature °F			Rel. Humidity %	Precip. inches	Wind Beaufort		Sky		Vic. 0-9	
	Max.	Min.	Mean			Range	a.m.	p.m.	a.m.	p.m.	a.m.
S 24	26	16	21	10	72	87	0	N 2	SW3	cl-ov	9-9
M 25	42	21	32	21	100	92	.64	W 6	W4	ov-ov	7-7
T 26	41	34	37	7	63	57	0	NW4	W 4	cl-cl	8-9
W 27	38	4	21	34	78	59	0	N 6	N 5	cl-cl	9-9
T 28	20	6	13	14	26	74	0	N 4	NE2	cl-cl	9-9
F 29	34	14	24	20	76	90	0	S 4	W 3	ov-ov	9-7
S 30	35	20	28	15	87	89	0	NE5	N 4	cl-cl	9-9
S 31	32	17	24	15	76	88	0	N 4	E 3	cl-cl	8-8
(Total)											
Mean	39.3	23.6	31.4	31.4	74.1	77.7	2.71	4.2	3.8		7.4-7.5

Highest Temperature 49 on the 4th Prevailing wind North. Days with
 Lowest 4.4 on the 27th sky clear 12 Pt. cldy. 9
 cloudy 10 Foggy 5

February

M 1	36	22	29	14	91	59?	0	E 4	N 2	m-ov	8-8
T 2	29	20	24	9	64?	88	0	N 2	N 4	ov-ov	8-8
W 3	31	25	28	6	88	67	0	NE3	NE5	ov-ov	8-8
T 4	30	17	24	13	85	73	0	N 5	E 1	cl-ov	9-8
F 5	25	20	23	5	76	74	0	SE2	E 4	ov-cl	7-9
S 6	30	23	26	7	81	89	0	E 6	SE5	ov-ov	9-8
S 7	35	23	29	12	81	46	0	SW4	NW5	ov-cl	8-9
M 8	29	15	22	14	85	68	0	N 3	NW2	cl-ov	8-8
T 9	41	25	33	16	86	100	.50	S 6	S 3	ov-f	8-3
W 10	41	34	37	7	100	48	0	N 2	N 2	ov-cl	8-9
T 11	41	19	30	22	71	60	0	N 4	N 4	cl-cl	9-9
F 12	37	13	25	24	78	82	0	N 4	SW6	cl-ov	9-8
S 13	44	33	39	11	75	77	0	W 4	SW3	cl-z	9-7
S 14	44	38	41	6	92	85	.28	S 4	SE6	ov-ov	8-7
M 15	44	33	38	11	91	81	0	W 7	W 8	ov-sq	8-7
T 16	35	18	26	17	71	75	0	N 4	NE4	cl-cl	8-9
W 17	31	17	24	14	84	46	0	NE3	NE7	ov-cl	8-8
T 18	35	17	26	18	86	70	0	NE4	N 3	cl-cl	9-9
F 19	40	26	33	14	58	51	0	O 0	SW2	cl-cl	9-9
S 20	46	32	39	14	91	62	0	N 2	NW3	cl-cl	9-9
S 21	45	32	39	13	65	92	0	E 2	SE3	f-z	6-7
M 22	45	32	38	13	80	76	0	E 5	E 6	ov-ov	8-8
T 23	41	34	38	7	91	88	.40	SE6	S 4	ov-ov	8-8
W 24	39	33	36	6	100	83	0	N 3	SW2	ov-cl	8-9
T 25	40	33	36	7	100	81	0	SE3	NW4	m-ov	8-9
F 26	35	25	30	10	56	71	0	N 3	NW3	cl-cl	9-9
S 27	38	26	32	12	77	46	0	N 4	NW5	ov-cl	8-9
S 28	36	15	25	21	52	55	0	NW4	N 3	---	9-9

Mean 37.2 25.0 31.1 80.5 71.2 1.18 (Total) 4.0 3.0 8.2-8.1

Highest Temperature 46.0 Prevailing wind North. Days
 Lowest 13.4 on the 12th with sky clear 6 Ft. Clody.
 11 Cloudy 10 Foggy 1

Date Temperature OF Rel. Humidity % Precip. inches Wind Beaufort Sky Vic.

Date	Temperature OF				Rel. Humidity %	Precip. inches	Wind Beaufort		Sky		Vic.	
	Max.	Min.	Mean	Range			a.m.	4 p.m.	a.m.	p.m.	a.m.	p.m.
March												
M 1	37	23	30	14	35	57	0	NW4	SW5			9-9
T 2	42	31	37	11	58	60	0	NW3	W 2			9-8
W 3	42	20	31	22	88	43	0	N 3	N 4			9-9
T 4	40	24	32	16	57	99	.15	SW5	NW6			9-7
F 5	36	22	29	14	76	46	0	N 3	N 3			9-9
S 6	26	9	18	17	81	39	0	N 4	NW4			9-9
S 7	30	13	21	17	65	34	0	N 5	N 5			9-9
M 8	35	20	27	15	63	63	0	N 3	SW4			9-9
T 9	43	32	38	11	95	75	.64	NE4	N 1			8-9
W 10	42	24	33	18	98	87	0	W 6	W 7			9-8
T 11	29	14	22	15	65	55	0	NW6	W 4			9-9
F 12	30	15	22	15	86	89	0	N 2	W 2			9-9
S 13	33	20	27	13	75	89	0	N 2	NW3			9-9
S 14	38	23	31	15	88	72	0	N 2	W 3			9-9
M 15	40	28	34	12	66	83	*	E 2	E 3			9-8
T 16	40	33	36	6	92	100	2.50	E 6	SE8			8-5
W 17	38	31	35	7	100	72	S	W 7	W 8	sq-sq		7-7
T 18	42	30	36	12	71	76	0	NW4	W 7			9-8
F 19	45	32	38	13	83	76	0	E 1	E 1	ov-ov?		9-8
S 20	43	32	37	11	75	47	0	N 3	W 3			9-7
S 21	42	32	37	10	95	100	.82	E 5	E 5	s-r & s		4-4
M 22	39	32	35	7	74	95	0	N 6	N 4	bc--		8-9
T 23	39	20	30	19	42	54	0	N 5	N 4	b-bc		8-9
W 24	37	17	27	20	40	43	0	N 4	NW5	b-bc		9-9
T 25	35	16	25	19	53	38	0	NE3	NE2	c-o		8-9
F 26	39	24	31	15	49	74	0	NE3	W 4	bc-o		9-8
S 27	-	30?	-	-	71	-	-	N 4	-	bc--		8--
S 28	-	-	-	-	-	-	-	-	-	---		---
M 29	(46)	(25)	(36)	(21)	-	58	0	-	N 3	---		---
T 30	50	32	41	18	55	59	0	N 3	W 3	c-o		9-8
W 31	41	32	37	9	53	58	0	N 3	W 3	bc-bc		9-9

Mean 38.6 24.5 31.5 70.7 67.0 4.11 (Total) 3.8 4.0 8.6-8.2

Highest Temperature 49.8 on the 30th Prevailing wind North Days with
 Lowest 9.4 on the 6th sky clear (2) Pt. Clody (3)
 cloudy (7) Foggy 0

Date	Temperature OF		Rel. Humidity %	Precip. inches	Wind Beaufort		Sky	Vic. 0-9		
	Max.	Min.			Mean	Range		a.m.	p.m.	a.m.
W 5	66	40	53	26	49	75	0	E 1 S 2	c-bc	8-8
T 6	50	42	46	8	100	100	*	SW2 SW4	f-f	2-1
F 7	51	42	9	77	66		1.54	NE6 NE6	o-c	8-8
S 8	50	40	45	10	92	86	0	E 2 E 2	o-c	8-8
S 9	49	41	45	8	100	93	.83	E 4 E 2	o-f	7-5
M 10	49	41	45	8	100	96	0	SW1 W 2	f-f	1-1
T 11	52	41	46	11	92	79	0	NW4 W 6	c-bc	9-8
W 12	54	40	47	14	80	73	0	N 2 W 3	b-c	9-9
T 13	51	43	47	8	86	100	0	W 6 SW2	bc-p	8-6
F 14	46	40	43	6	100	-	*	NE4 NE-	r-d	5-7
S 15	49	38	44	11	100	-	.64	NE5 S 6	o-r	7-6
S 16	52	41	47	11	100	80	.60	W 1 SW2	f-bc	1-8
M 17	56	42	50	12	75	82	0	E 2 E 1	bc-bc	9-8
T 18	56	40	48	16	98	76	0	S 3 SW4	f-bc	3-7
W 19	57	40	48	17	86	86	0	S 2 E 1	f-z	6-7
T 20	50	42	46	8	96	93	1.14	SE6 S 7	f-o	2-7
F 21	52	42	47	10	80	81	0	W 3 W 2	c-bc	8-9
S 22	62	42	51	22	87	60	0	W1 S 2	Bc-bc	9-9
S 23	63	42	52	21	87	72	0	E 3 E -	bc-bc	9-9
M 24	58	43	51	15	93	86	.28	SE4 S 1	r-f	7-3
T 25	63	40	52	23	88	96	0	E 2 NW1	bc-bc	8-9
W 26	55	45	50	10	87	81	0	E 3 W s	c-c	9-8
T 27	51	42	47	9	85	100	.48	SE4 E 4	r-r	5-4
F 28	61	43	52	18	94	82	0	N 1 NW1	0-b	8-8
S 29	63	43	53	20	77	77	0	N 1 W 2	b-bc	9-9
S 30	63	44	53	19	73	67	0	W 2 SW5	b-bc	9-9
M 31	59	45	52.9	14	81	77	0	W 4 W 6	z-z	7-6
(Total)										
Mean	55.9	41.4	48.6	80.9	78.4	5.51	3.0	3.0	7.0-7.2	

Highest Temperature 88 on the 4th Prevailing wind East Days with
 Lowest 36.8 on the 1st sky clear 6, Pt. cldy 12, Cloudy
 15, Foggy 6

June

T 1	58	46	52	12	82	87	0	SW3 NW6	f-t	6-6
W 2	65	43	54	22	76	76	0	E 2 NW3	b-bc	9-9
T 3	59	42	51	17	84	87	0	NE3 NE1	bc-o	9-9
F 4	60	45	53	15	93	88	.80	N 3 W 1	c-f	8-6
S 5	59	45	52	14	88	87	0	NW2 W 3	bc-q	8-8
S 6	62	42	52	20	88	64	0	N 2 W 3	b-bc	9-9
M 7	61	46	53	15	87	88	0	SW3 W 3	bc-o	8-7
T 8	53	46	50	7	100	95	0	s 2 SW2	f-f	1-1

Date	Temperature				Rel. Humidity %	Precip. inches	Wind Beaufort	Sky	Vis.		
	°F										
	Max.	Min.	Mean	Range	9-8.30 a.m.	4 p.m.	6 p.m.	9-8.30 a.m.	4-2 p.m.	5 p.m.	
W 9	61	46	54	15	89	79	.52	0 0 SW3	f-bc	1-7	
T 10	60	45	52	15	84	81	0	W 1 SW1	bc-f	7-6	
F 11	64	45	54	19	94	83	.70	NE4 NW2	o-c	8-9	
S 12	65	44	54	21	74	77	0	E 1 W 3	bc-bc	9-9	
S 13	60	45	52	15	88	75	.12	NW3 W 3	bc-bc	9-9	
M 14	60	47	53	13	85	94	*	S 4 S 5	f-o	5-7	
T 15	68	46	57	22	100	83	.17	NW2 W 2	f-b	2-6	
W 16	65	47	56	18	64	66	0	SE2 W 2	b-bc	9-9	
T 17	59	45	52	14	70	88	0	S 3 W 3	bc-f	8-3	
F 18	54	43	49	11	87	100	.78	E 3 E 3	f-f	1-1	
S 19	61	47	54	14	85	88	.36	NE6 NE2	o-bc	8-9	
S 20	59	45	52	14	88	74	0	W 2 SW2	bc-f	9-3	
M 21	57	46	51	11	94	97	0	S 3 S 3	f-f	2-2	
T 22	56	47	51	9	100	97	.9	S 4 W 2	f-f	1-3	
W 23	57	49	58	18	83	75	0	N 5 E 2	bc-bc	9-9	
T 24	73	49	60	24	75	71	0	NW2 NW2	b-bc	9-9	
F 25	70	50	60	20	87	100	.16	NE5 NE6	o-r	8-8	
S 26	65	48	57	17	99	-	0	NE5 E 3	bc-bc	8-9	
S 27	69	53	61	16	88	84	82	0	NE3 NE2 NE1	o-bc-bc	9-9-8
M 28	59	47	53	12	88	78	99	T	W 2 SW2 E 1	f-f-f	4-5-1
T 29	65	50	57	15	94	75	99	.14	SE2 NE2 E 1	f-c-r	1-8-6
W 30	67	48	58	19	98	86	97	T	NE3 W 3 N 2	f-f-f	2-2-2
(Total)											
Mean	62.0	46.2	54.1	37.4	83.7		(4.06)	2-8	2.6	6.2-6.6	
Highest temperature	72.9 on the 24th						Prevailing wind West Days				
Lowest	42.4 on 3rd and 6th						with sky clear 4, Pt. cldy 13, Cloudy 13, Foggy 11				

July

T 1	61	48	54	13	96	94	-	T	S 2 S 2 S 3	f-f-f	1-2-1
F 2	59	47	53	12	85	88	96	0	W 2 W 3 W 2	bc-c-bc	8-9-8
S 3	60	47	53	13	91	81	97	0	W 2 W 4 W 2	b-bc-bc	7-8-6
S 4	64	47	56	17	88	78	99	0	W 2 W 2 W 2	bc-bc-f	5-5-1
M 5	61	47	54	14	88	82	95	0	W 2 W 3 W 3	f-bc-bc	2-7-7
T 6	67	50	58	17	82	82	91	.07	NW3 W2 W 3	bc-bc-bc	7-8-7
W 7	67	51	59	16	95	74	88	.06	NW1 SW2 S 1	r-c-c	8-8-8
T 8	72	51	62	21	85	77	89	T	NW3 W 2 W 2	c-bc-bc	8-8-8
F 9	79	54	67	25	65	66	82	0	N 1 W 3 W 2	bc-bc-bc	8-8-8
S 10	76	50	63	26	80	56	94	0	W 2 W 1 W 2	c-bz-bc	8-8-8
S 11	75	53	64	22	52	63	73	0	NE2 SE1 W 2	bc-c-c	9-9-8
M 12	70	49	59	21	89	78	75	0	NW2 E 2 SE1	c-bc-c	9-9-9
T 13	61	50	55	11	95	92	93	.54	E 5 NE4 N 1	r-r-bc	8-8-8

Date	Temperature				Rel. Humidity		Precip.		Wind			Sky			Vis.		
	OF				%		inches	Beaufort									
	Max	Min	Mean	Range	5:30 a.m.	2 p.m.	8 p.m.	8p-8p	8:30 a.m.	2 p.m.	8 p.m.	8:30 a.m.	2 p.m.	8 p.m.	8:30 a.m.	2 p.m.	8 p.m.
					July	(con.)											
W 14	74	48	61	26	76	58	81	0	NE3	W 2	NW2	bc-bc-bc	8-9-9				
T 15	62	48	55	14	76	79	94	0	SW4	SW4	SW3	bc-bc-bc	9-7-7				
F 16	65	50	57	15	97	97	95	.10	S 3	SW2	SW2	f-f-f	2-1-2				
S 17	66	50	58	16	86	79	91	T	W 2	SW3	W3	f-b-bc	4-7-7				
S 18	69	49	59	20	91	80	95	0	W 3	W 3	W 2	bc-bc-bc	5-8-8				
M 19	75	51	63	24	81	71	67	0	NE3	NE2	NE1	c-bc-bc	8-8-8				
T 20	70	50	60	20	65	68	94	0	E 1	SW3	W 2	bc-bc-bc	9-8-8				
W 21	63	49	56	14	88	84	97	0	W 2	W 3	W 2	f-bc-f	3-7-3				
T 22	64	48	56	16	91	74	90	0	W 2	SW3	W 3	bc-bc-bc	8-9-9				
F 23	65	50	58	15	83	79	91	0	W 3	SW4	SW4	bc-bc-c	8-7-8				
S 24	67	52	59	15	79	75	97	0	S 4	S 4	S 3	bc-bc-c	8-9-7				
S 25	69	50	60	19	86	78	97	T	W 2	W 2	SW1	f-f-f	6-6-3				
M 26	66	51	58	15	99	89	98	0	S 3	S 3	S 4	f-f-f	2-1-1				
T 27	65	54	59	11	95	94	100	T	SW4	SW4	SW2	f-f-f	3-2-2				
W 28	63	51	57	12	91	76	94	0	W 3	W 3	NW2	c-bc-c	7-8-8				
T 29	73	49	61	24	84	68	94	0	W 2	W 2	W 1	bc-bc-bc	8-8-8				
F 30	69	49	59	20	97	74	100	0	S 1	S 2	W 1	f-c-bc	1-7-7				
S 31	67	50	57	17	91	82	94	0	E 2	E 2	SE1	c-c-c	7-7-7				
(Total)																	
Mean	67.2	49.8	58.4	85.4	77.9	91.4	.77	2.3	2.6	2.1		6.3-7-6.4					

Highest temperature 79.1 on the 9th Prevailing wind West Days
 Lowest 47 on the 2,3,& 5 with sky clear 12, Pt. cldy.
 9, Cloudy 10, Foggy 9

August

S 1	60	54	57	6	95	99	100	.72	NE4	NE6	NW3	o-o-r	7-6-3
M 2	67	52	59	15	91	80	94	.20	W 4	SW4	SW2	bc-bc-f	7-7-2
T 3	60	52	56	8	100	100	99	.33	SW2	S 3	SW1	f-frt-f	3-2-1
W 4	70	49	69	21	94	77	94	0	W 2	W 3	W 3	f-bc-c	3-7-7
T 5	62	53	58	9	100	95	100	0	W 3	SW4	W 2	f-f-f	1-2-1
F 6	70	51	60	19	91	75	99	0	W 2	SW3	SW1	f-bcz-f	3-7-2
S 7	70	52	61	18	100	83	100	0	S 2	SW2	SW3	f-f-f	1-2-2
S 8	68	55	62	13	100	83	100	0	SE2	W 2	W 2	f-f-f	1-4-1
M 9	65	53	59	12	100	92	100	0	S 3	S 3	S 3	f-f-f	2-2-2
T 10	64	53	58	11	100	97	100	0	SW3	SW3	SW3	f-f-f	1-2-2
W 11	66	54	60	12	100	90	100	T	SW3	SW5	SW4	f-f-f	2-2-1
T 12	69	58	63	11	100	87	100	0	SW4	S 4	SW4	f-f-f	1-2-1
F 13	62	54	58	9	100	87	91	T	SW5	SW4	NW2	f-bc-bc	1-6-7
S 14	73	52	62	21	87	66	94	0	SW2	W 2	W 2	c-bc-bc	6-8-9
S 15	72	54	63	18	66	72	88	0	E 1	W 3	W 3	bc-bc-bc	9-9-9
M 16	70	53	61	17	86	85	89	0	W 2	W 2	SW3	bc-bc-bc	8-5-7

Date	Temperature			Rel. Humidity %	Precip. inches	Wind Beaufort			Sky			Vis. 0-9		
	Max	Min	Mean			Range	8.30 a.m.	8 p.m.	8p-8p	8.30 a.m.	2 p.m.	8 p.m.	8.30 a.m.	2 p.m.
August (con.)														
T 17	67	65	61	12	92	78	97	0	W 2	W 3	W 1	f-f-f	4-4-4	
W 18	70	55	62	15	99	80	94	.93	NE3	E 2	W 1	ct-bc-bc	7-3-8	
T 19	68	52	60	16	79	66	94	0	S 1	SW4	S 4	bc-o-bc	8-9-7	
F 20	71	55	63	16	100	85	100	.01	W 2	S 1	W 1	f-f-f	1-2-1	
S 21	69	53	61	16	100	85	97	T	S 2	SW3	W 2	f-f-f	1-2-3	
S 22	64	54	59	10	85	68	85	.15	N 2	NE2	E 2	o-c-c	8-9-9	
M 23	58	53	56	5	85	85	94	T	NE4	E 3	NE2	o-o-c	8-8-8	
T 24	67	52	59	15	72	70	94	0	NE1	SW3	W 2	bc-bc-bc	8-8-8	
W 25	65	51	58	14	91	78	94	0	NW2	W 2	SW2	bc-bc-bcf	8-7-4	
T 26	65	53	59	12	100	79	94	0	W 4	W 4	SW3	bcf-bc-c	6-7-7	
F 27	62	54	58	8	94	89	100	.13	SW1	SW2	SW2	r-f-f-	7-4-1	
S 28	73	52	63	21	92	72	92	0	NW1	W 1	NW1	bcf-bc-bc	6-7-7	
S 29	71	54	63	17	70	68	88	0	NE1	SW2	W 2	bz-bcz-bc	7-7-7	
M 30	66	53	60	13	89	90	97	0	W 1	SW3	W 2	bf-f-bc	5-1-7	
T 31	66	54	60	12	100	83	97	0	W 2	SW2	SE1	f-f-f	3-1-1	

(Total)

Mean 66.8 53.2 59.9 92.2 81.9 95.7 2.37 2.7 2.9 2.2 4.6-5.1-4.5

Highest temperature 73.4 on the 28th
 Lowest 49.1 on the 4th
 Prevailing wind Southwest
 Days with sky clear 8,
 Pt. cldy. 8, Cloudy 15,
 Foggy 17.

September

V 1	64	54	59	10	100	90	100	0	S 1	SW2	W 1	f-f-f	1-2-1
T 2	64	55	59	9	100	87	100	0	SW2	SW3	SW2	f-f-f	1-2-1
F 3	65	54	59	11	100	95	99	0	SW2	SW3	SW2	f-f-fl	1-1-3
S 4	67	56	61	11	90	84	100	.35	W 4	W 3	W 1	f-f-fl	4-6-3
S 5	61	51	56	10	82	76	76	.43	N 5	N 4	NE4	c-c-c	8-8-9
M 6	64	48	56	16	73	63	93	0	NE5	NE3	NE1	bc-bc-bc	9-9-9
T 7	62	48	55	14	88	74	88	0	NW2	SW3	W 3	bc-bc-bc	8-8-8
W 8	69	49	59	20	85	69	51	0	N 3	S 1	NE4	c-bc-b	8-8-8
T 9	60	44	52	16	60	67	84	0	N 1	W 3	SW3	b-b-bc	9-9-8
F 10	64	51	57	13	78	72	94	0	SW3	SW4	S 2	bc-bc-bc	9-9-8
S 11	61	52	56	9	97	100	100	.70	NE3	E 3	SE4	o-r-f	7-7-2
S 12	66	54	60	12	99	85	100	.41	SW4	SW4	SW3	f-f-f	3-5-3
M 13	61	54	57	7	100	94	100	.32	NE3	NE4	NE4	f-r-r-	3-4-3
T 14	69	55	62	14	100	91	88	.19	SW1	SW3	W 5	rf-oz-b	2-7-7
W 15	64	48	56	16	91	-	-	0	SW2	--	--	b-----	9----
T 16	67	51	59	16	89	79	-	0	S 3	W 2	-	b-b	7-7

CONCLUSION

Our greatest need is for the new laboratory building. The proposed structure will have a floor plan measuring 25' x 60'. An uninterrupted series of windows will provide a wealth of light. Suitable tables, benches, blackboards, and electric lighting will be provided. It will provide space for our research investigators and seminar rooms. The effectiveness of the Station will always be seriously handicapped until these new facilities are available. That funds for this project are forthcoming is my most sincere hope.

Other items on our 1938 budget referring to Station equipment are (1) New motor for the Scientist, (2) More cots and mattresses, (3) Renovation of Wharf Buildings, (4) Completion of the Well, and (5) Installation of the new Electric Plant.

A broadcast over the Blue Network of the National Broadcasting Company was made at 11:00 P.M., December 30, 1937. The program was relayed to New York by short wave direct from the island. Members of the staff spoke on various aspects of the research investigations. The color motion picture film "KENT'S ISLAND - Outpost of Science" is carrying a vivid description of the Station to audiences throughout New England.

It has been another good year for Kent's Island. It has made extensive additions to its equipment, carried out its research program, and made new and devoted friends. It is widening its horizons to include new fields of activity. And most important it is making itself more and more an integral part of the College.

I must extend our sincere gratitude to Messrs. Sumner T. Pike, J. Sterling Rockefeller, Henry S. Shaw, Henry Hill Pierce, and Albert T. Gould for their financial support and to the various business houses that have so kindly continued to donate equipment and supplies.

Respectfully submitted,

WILLIAM A. O. GROSS
Director