THE FOURTH ANNUAL REPORT OF THE BOWDOIN SCIENTIFIC STATION

Bulletin No. 6 Bowdoin College, Brunswick, Maine April 1, 1939

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DIRECTORS

Donald B. MacMillan
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Manton Copeland
John S. Rockefeller
Sumner T. Pike
Edward N. Goding
Albert T. Gould
Alger W. Pike
Henry S. Shaw
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Philip W. Meserve
Adriel V. Bird
W. A. O. Gross, Secretary

FIELD DIRECTOR

William A. O. Gross

THE BOWDOIN SCIENTIFIC STATION

Kent Island, Bay of Fundy

New Brunswick, Canada

THE FOURTH ANNUAL REPORT OF THE BOWDOIN SCIENTIFIC STATION

436 Seventh Avenue
Pittsburgh, Penna.
April 1, 1939.

To the President and
Trustees of Bowdoin College

Sirs:

I have the honor to submit the fourth annual report of the Bowdoin Scientific Station at Kent Island covering the year 1938.

A staff of twenty-five men spent the summer season at the Station and carried on an extensive research program. No sickness or accident of any kind was experienced. Notable progress was made in many directions.

To the equipment was added a new laboratory and dormitory building providing suitable facilities for six more people, a 110 horse power motor for the cruising boat Cavalier, wind measuring and other meteorological instruments, a 3 Kilowatt electric generating plant, and a small barn.

Scientific contributions include two recently published papers on ornithological subjects. Our studies in bird migration and our sound recording of wild life have attracted wide attention. Four short wave broadcasts were relayed over the blue network of the National Broadcasting Company.

THE STAFF

A committee of the Boards of Bowdoin College consisting of R. L. Dana, Chairman, and Messrs. A. T. Gould, E. N. Goding and Professor A. O. Gross was appointed to study Kent Island and to determine the future policies to be followed by the Scientific Station. It is probable that a permanent group of four or five men will be selected to serve as trustees of the Station. The directing board now includes:

Donald B. MacMillan, Provincetown, Mass.
Alfred O. Gross, Bowdoin College, Brunswick, Maine
Manton Copeland, Bowdoin College, Brunswick, Maine

Philip W. Meserve, Bowdoin College, Brunswick, Maine
J. Sterling Rockefeller, 52 Wall Street, New York, N.Y.
Sumner T. Pike, 120 Wall Street, New York, N.Y.
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Alger W. Pike, Lubec, Maine
Henry S. Shaw, 136 High Street, Exeter, New Hampshire
Charles F. Brooks, Blue Hill Observatory, Milton, Mass.
Adriel U. Bird, 291 Atlantic Avenue, Boston, Mass.
W. A. O. Gross, Secretary, U.S. Steel Corp., 436 Seventh Ave., Pittsburgh, Pa.

In the field staff which was officially based at the island from June 11th until September 20th were William A. O. Gross, Director, Harvard University, U.S. Steel Corp., 436 Seventh Avenue, Pittsburgh, Pa.; Robert W. Harrington, Assistant Director, Bowdoin College, University of New Hampshire, Durham, N.H.; Ernest A. Joy, Caretaker, Little Wood Island, N.B.; Lester E. Tate, Superintendent, Ingall's Head, N.B.; Newell E. Gillett, Chief of Navigation, Bowdoin College, 4 Bay State Road, Worcester, Mass.; Donald R. Griffin, Chief Biologist, Harvard University, Harvard Biological Laboratories, Cambridge, Mass.; Thomas A. Gross, Chief Radio Engineer, Bowdoin College, Electronic Applications, Brunswick, Maine; Robert M. Cunningham, Chief Meteorologist, M.I.T., 40 Lexington Avenue, Cambridge, Mass.; Frederick H. Crystal, Radio, Bowdoin College, 2 Willow Road, Woodmere, L.I.; Charles S. Brand, Ornithology, Bowdoin College, 9 East Avenue, Ithaca, N.Y.; David L. Putnam, Surveying, Harvard College, 22 Garden Street, Cambridge, Mass.; Douglas P. Dryer, Commissary, Harvard Graduate School, 22 Garden Street, Cambridge, Mass.; Richard H. Stroud, Biologist, Bowdoin College, High Street, Pembroke, Mass.; Edward Stevens, Jr., Biologist, Bowdoin College, Inspiration Drive, La Jolla, Cal.; Frederick Greely, Biologist, Harvard College, 200 Chestnut Street, Winetka, Ill.; Douglas H. Robinson, Biologist, Harvard College; Ralph P. Reynolds, Boat Engineer, Bowdoin College, New Britain, Conn.; Henry A. Wheeler, Commissary, Bowdoin College, Concord, Mass.; Ivan Spear, Ornithology, 44 Cottage Farms Road, Cape Elizabeth, Maine; Donald F. Cay, Deck Hand, Milton Academy, 90 Governor's Road, Milton, Mass.; Douglas V. Whitelegg, Radio, Browne and Nichols School, 10 Bonaire Circle, Waban, Mass.; B. Samuel Lacy, Jr., Photography, Harvard College; Buffalo, N.Y.; Chandler Gifford, Jr., Ornithology, Belmont Hill School, Cambridge, Mass.; Richard Taylor, Ornithology, Taunton, Mass.; Carey Chase, Cook, Little Wood Island, N.B.; Richard W. Melville, Machinist, 9 Brooks Park, Medford, Mass.; Walter Hill, Asst. Meteorologist, Cambridge School, 59 Village Hill Road, Belmont, Mass.

Charles E. Ruckstuhl, Jr. has been appointed Acting-Field Director for the coming season. Requests for information should be addressed to him at Longwood Towers, Brookline, Mass.

Visits were made to Kent Island during the summer of 1938 by Dr. and Mrs. Alfred O. Gross, Bowdoin College, Brunswick, Maine; Dr. and Mrs. Frederick A. Saunders, Harvard University, 9 Berkeley Place, Cambridge, Mass.; Dr. and Mrs. Paul A. Kellogg, Cornell University, Ithaca, N.Y.; Professor Philip W. Meserve, Bowdoin College, Brunswick, Maine; Mr. Henry S. Shaw, General Radio Company, Cambridge, Mass.; Dr. and Mrs. George C. Shattuck, Harvard Medical School, 450 Warren Street, Brookline, Mass.; Stanley Williams, Jr., 71 Washington Square, N.Y.C.; and Mr. and Mrs. Thomas D. Cabot, 77 Franklin Street, Boston.

BIRD BANDING 1938
(by Charles S. Brand)

The Scientific Station at Kent Island again joined the Co-operative Gull Banding Project sponsored by the Linnean Society of New York and the Bureau of Biological Survey, Washington, D.C. For this work nine of the largest colonies of Herring Gulls in Eastern United States and Canada have been selected.

In order to facilitate the identification of the gulls of the different colonies by field observers, colored celluloid bands are used in addition to the numbered aluminum Biological Survey bands. A color combination is allotted to each of the nine colonies. The Kent Island combination for the summer of 1937 was a red celluloid band placed beneath the aluminum band for the immature birds. For the adults a black band was placed on the other leg. Left and right were not differentiated in 1937. For the summer of 1938 the following combinations were used. For the immature, an aluminum band on the left, and a black band over red on the right tarsus. For the adults a red over an aluminum band on the left and a white celluloid band on the right tarsus.

Many field observations have been reported especially in southern New England, New York and New Jersey. It is yet too early to predict the success of this project. It is evident that certain changes in procedure will have to be modified. The greatest handicap has been, and will continue to be, the lack of competent field observers located along the entire range of the gulls.

A comprehensive paper based on banding records of Kent Island is now being prepared by Dr. Alfred O. Gross and cooperators of the Kent Island Station. For purposes of comparision over 1,000 returns of gulls banded in the Great Lakes Region are also being included.

The Herring Gull colony on Kent Island is one of the largest in North America. Conservative estimates reveal that there are approximately 20,000 pairs nesting on the Island. The nesting territory is largely concentrated on the south end where in an

area of about 200 acres it is often difficult to walk without stepping on some of the eggs concealed in crevices or by the thick vegetation.

This year the first chicks hatched early in July. The first trip to the south end, where most of the banding was done, was made on July 9th. At this time the young were too small for banding, the tarsi not being sufficiently developed to hold the array of celluloid bands. However in a few days we were able to begin active banding work. At the height of the season it was found that one man could band about 60 birds in the course of an hour. The record for numbers banded during 1938 was made on July 25th when four men banded 352 birds. In the banding activities this summer, the following members of the Station assisted,- Messrs. Greeley, Spear, Joy, Stroud, Gifford, Kraetzer, Melville, Williams, Hill, Cay, Whitelegg, Warren, Harrington, Wheeler and Dr. Paul Kellogg.

The main enemy of the Herring Gull aside from other Herring Gulls is its close relative, the Black-backed Gull. Larger and more powerful the Black-back will tolerate no young Herring Gulls in its territory and scores of the latter were found near the Black-backed nests. At present there are about 15 nests of the Black-backed Gull on Kent Island.

For the past two summers attempts have been made to band adult gulls. The system used in the past was jack-lighting which could be employed successively only on the darkest foggiest nights. About 400 adult gulls for the season was the largest number banded by this method and from the reports of the difficulty of this system we decided not to use it again. Instead I constructed a self catching trap having the wire on the top lead down to a ladder in the middle, a design used successfully in trapping crows. Our ladder had rungs two feet apart, and was placed in a horizontal position about two feet from the ground. The construction was such that the birds could jump down between the rungs, as their wings are then folded. This afforded an easy and natural entrance to the trap but escape was impossible because they could not fly back through the rungs. After trying seal meat and various species of fish we discovered Herring to be the best bait. These fish started running the first week of August. On the morning of August 4th we secured a bucketful which were placed in the trap. By afternoon 27 adult gulls had been trapped. Thereafter herring was used exclusively until the end of the season. This trap caught 208 adults and about 50 young. The latter entered by means of a ground funnel.

On August 2nd a second trap was completed in which I added a long twenty foot tunnel which led from the baited trap into the banding cage. The birds found their way into it and thus did not scare others away from the main trap. The second trap was ten feet square and 2 1/2 feet high. The top was covered over with cross logs two feet apart, giving the birds a greater area

into which to enter. A large funnel lead in the front which attracted many young gulls into the trap. The young birds could not have gotten in from the top. This trap netted 512 adults and 75 young making a grand total of 720 adults and 125 young. Twelve birds banded in previous years and several banded birds of the season made two ro more successive visits to the trap. To prevent injuries to the birds the trap was lined with burlap to a height of two feet.

The number of birds that can be banded on Kent Island is largely dependent on the supply of Herring for bait and the number of available cooperators. For the next season in addition to the traps used in 1938, Dr. Kellogg has suggested constructing a trap with a long funnel leading into a banding cage. This cage to be hidden in the woods far enough away so as not to disturb the birds entering the trap when banding operations are in progress.

If the staff is large enough the work could be broadened to include an ecological study of the birds. While one group is recording colors and taking measurements in life, the second group would be banding. In this way information could be accumulated about the soft parts at various stages of development of the birds, not now available. This work with very litte extra effort might very well be an extremely valuable contribution.

During the season of 1938 at Kent Island we banded 3059 immature and 720 adults. The following number of gulls have been banded at Kent Island and neighboring islands since the work was started.

Person in charge	Year	Number of gulls banded	
Whitman and Fisher	1934-35	2,248	
John Crystal	1935	6,804	(50 adults)
John Crystal	1936	8,000	(400 adults)
Nahum Pilsbury	1937	4,851	(200 adults)
Charles S. Brand	1938	3,779	(720 adults)
	Total	25,682	

Of unusual interest is twelve adult Herring Gulls caught in the trap which had been previously banded on Kent Island. In addition there were three found dead that had been banded on previous years.

Band No.	Date of Recovery (Captured alive)	Date of Banding	Banded by	Age when banded
35-552982	July 31, 38	July 30, 35	J.A. Crystal	Im.
35-556037	Aug. 2, 38	Aug. 26, 35	J.A. Crystal	Im.
35-557947	Aug. 5, 38	July 25, 36	J. Botsford	Adult
35-556647	Aug. 5, 38	Aug. 27, 35	J.A. Crystal	Adult
35-557965	Aug. 8, 38	July 25, 36	J. Botsford	Adult

Band No.	Date of Recovery (Captured alive)	Date of Banding	Banded by	Age when banded
35-556748	Aug. 8, 38	Aug. 27, 35	J.A.Crystal	Adult
35-557944	Aug. 9, 38	July 25, 36	J.A. Crystal	Adult
B-624734	Aug. 10, 38	July 21, 34	F.B. Whitman	Im.
35-556015	Aug. 15, 38	Aug. 26, 35	J.A.Crystal	Im.
37-657591	Aug. 24, 38	Aug. 27, 37	N.R. Pillsbury	Adult
35-556790	Aug. 27, 38	Aug. 27, 35	J.A. Crystal	Adult
35-556682	Aug. 27, 38 (Found dead)	Aug. 27, 35	J.A. Crystal	Adult
37-654209	July 5, 1938	July 12, 37	N.R. Pillsbury	Im.
35-549958	July 10,1938	July 22, 35	J.A. Crystal	Im.
37-654185	July 25, 1938	July 12, 37	N.R. Pillsbury	Im.

In addition to the Herring Gulls the following birds were also banded at Kent Island during the summer of 1938.

Name of bird	Number of adults	Young	Total
Leach's Petrel	558	-	558
Savannah Sparrow	5	29	34
Spotted Sandpiper	-	19	19
Barn Swallow	1	4	5
Black Guillemot	-	1	1
Semipalmated Sandpiper	1	-	1
Total	565	53	618

The following Leach's Petrels caught at Kent and Little Wood during 1938 had been previously banded as follows,-

Band No.	Date of Recovery	Date of Banding	Banded by	Place
C-2312	June 13 1938	July 11, 35	J.A. Crystal	Kent Id.
C-137041	June 26 "	July 2, 34	F.B. Whitman	" "
C-2332	June 27 "	July 12, 35	J.A. Crystal	" "
37-138114	July 10 "	July 19, 37	W. Valencourt	" "
37-138109	July 13 "	July 19, 37	W. Valencourt	" "
37-138106	July 13 "	July 19, 37	W. Valencourt	" "
C-137042	July 10 "	July 2, 34	F.B. Whitman	" "
34-233143	July 14 "	July 25, 34	F.B. Whitman	" "
34-233165	June 29 "	July 28, 34	F.B. Whitman	" "
C-2337	July 10 "	July 12, 35	J.A. Crystal	" "
C-137003	July 17 "	July 30, 34	F.B. Whitman	" "
C-137026	July 17 "	July 2, 34	F.B. Whitman	" "
37-138108	July 17 "	July 19, 37	W. Valencourt	" "
36-71627	July 20 "	Aug. 4, 36	J.A. Crystal	" "
C-137026	July 26 "	July 2, 34	F.B. Whitman	" "
37-138127	July 27 "	July 19, 37	W. Valencourt	" "

34-148217	Aug. 4, 1938	Aug. 23, 34	F.B. Whitman	Little Wood Island
35-124060	Aug. 7, "	July 31, 35	F. B. Whitman	"
35-124066	Aug. 12, "	July 31, 35	F.B. Whitman	"
35-124075	Aug. 14, "	July 31, 35	F. B. Whitman	"
35-124144	Aug. 12, "	July 31, 35	F.B. Whitman	"
35-124099	Aug. 15, "	July 31, 35	F.B. Whitman	"
35-124073	Aug. 12, "	July 31, 35	F.B. Whitman	"
35-124018	Aug. 12, "	July 23, 35	F.B. Whitman	"

Most of the petrels in the preceding list were recoverd by D. R. Griffin during the course of his special problem on the petrel. All were adults when banded. It is interesting to note that all of the petrels were retaken in the same locality on the same islands where they were originally banded. It is possible that some of them were occupying the same burrows where they were originally banded. It is further evidence that Leach's Petrel is very tenaceous in clinging to its particular nesting site.

A Barn Swallow number 36-70615 banded by John A. Crystal on July 1, 1936 was found dead on Kent Island, July 8, 1938.

RECOVERIES OF HERRING GULLS BANDED AT KENT ISLAND
not previously reported

Number	Banded	Recovered	Place of Recovery	How Recovered
35-548127	8-1-35	10-30-37	Long Island, N.Y.	Found
35-548246	8-1-35	1-24-38	Ipswich, Mass.	Found Dead
35-548305	8-1-35	7-23-38	Manset, Maine	Found Dead
35-548728	8-1-35	11-14-37	Framington, Mass.	Caught Exhausted
35-548967	8-1-35	2-4-38	Northport, L.I., N.Y.	Found Dead
35-549022	8-1-35	6-16-38	Mud Is., N.S.	Found Dead
35-549895	7-22-35	2-3-38	Deer Isle, Me.	Found Dead
35-550758	8-10-35	5-29-38	Lynn, Mass.	Found Dead
35-551667	8-1-35	6-13-38	Long Island, N.Y.	Found Dead
35-552182	7-29-35	2-26-38	Long Island, N.Y.	Found Dead
35-552245	7-27-35	12-25-37	Mandarin, Fla.	Found Dead
35-552260	7-27-35	2-10-38	Westmoreland Co., N.B.	Drowned
35-552390	7-27-35	3-29-38	Atlantic City, N.J.	Found Dead
35-552653	7-29-35	2-16-38	Staten Id., N.Y.	Found Dead
35-552734	7-29-35	8-19-38	Long Island, N.Y.	Found
35-552780	7-29-35	Nov.-36	Rose Blanche, Nfld.	Shot
35-552938	7-30-35	10-24-37	Digby Co., N.B.	Found Dead
35-555202	8-25-35	July-37	Grand Manan, N.B.	Killed
35-555796	8-25-35	12-19-37	Digby Co., N.S.	Found Dead
35-555906	8-25-35	12-6-37	Eastport, Me.	Found Dead
35-556174	8-26-35	7-31-38	Cape Cod, Mass.	Found Dead
35-556336	8-27-35	12-10-37	St. Andrews, N.B.	Found dead
35-556810	8-29-35	10-16-37	Brigantine Beach, N.J.	Killed by Car
35-556908	8-29-35	Winter-37	Baltimore, Md.	Shot
35-557497	8-9-36	6-19-38	Boston, Mass.	Found Dead
35-557716	7-25-36	11-12-38	Long Island, N.Y.	Found Dead

Number	Banded	Recovered	Place of Recovery	How Recovered
35-557729	7-25-36	10-7-37	Canso, N.S.	Found Dead
35-557990	7-25-36	11-18-37	Rossway, N.S.	Caught on Trawl
36-641574	7-22-36	11-28-37	Oyster Bayou, La.	Found Dead
36-641658	7-27-36	2-26-38	King's Point, L.I.	Found Dead
36-641663	7-27-36	10-19-38	Parkers' Cove, N.S.	Found Dead
36-641814	7-27-36	11-26-37	Deer Id., N.B.	Crippled
36-641924	7-27-36	12-18-37	Brooklyn, N.Y.	Found Dead
36-641935	7-27-36	Winter-37	Baltimore, Md.	shot
36-641989	7-27-36	2-14-38	Staten Id., N.Y.	Found Dead
36-642988	7-26-36	11-20-37	Egmont Bay, P.E. Id.	Found Dead
36-642741	7-26-36	Feb.-38	Manns Harbor, N.C.	Caught
36-642712	7-26-36	1-21-38	Hampton, Va.	Found Dead
36-642526	7-26-36	10-11-37	Prince Edward Is.	Found Dead
36-642451	7-26-36	9-29-37	Fisher's Is., N.Y.	Found Dead
36-642428	7-26-36	11-15-37	Eastport, L.I., N.Y.	Found Dead
36-642274	7-26-36	11-12-37	Jonesport, Me.	Found Dead
36-642121	7-26-36	4-5-38	Merrick, L.I., N.Y.	Found Dead
36-642082	7-26-36	8-26-38	Cape Cod, Mass.	Dying Killed
36-643344	7-26-36	9-6-37	Glen Cove, Me.	Found Dead
36-643598	7-26-36	5-12-38	Newburyport, Mass.	Found Dead
36-643686	7-26-36	11-12-37	Severn, Va.	Found Dead
36-643734	7-26-37	11-1-37	East Bathurst, N.B.	Killed
36-643755	7-26-36	8-2-38	Interstate Park. N.J.	Found Dead
36-643850	7-26-36	11-9-37	Harts Is., N.Y.	Found Dead
36-643888	7-26-36	8-23-38	Cape Cod, Mass.	Found Dead
36-644077	7-30-36	8-26-38	Jones Inlet, L.I., N.Y.	Caught Released
36-644428	7-30-36	12-21-37	Snead's Ferry, N.C.	Found Dead
36-644450	7-30-36	10-26-38	Brooklyn, N.Y.	Found Dead
36-644554	7-30-36	5-9-38	Remsenburg, L.I., N.Y.	Found Dead
36-644614	7-30-36	2-16-38	Staten Is., N.Y.	Shot
37-654340	7-15-37	12-22-37	Green's Farms, Conn.	Found Dead
37-654367	7-16-37	11-12-37	Point Judith, R.I.	Found Dead
37-654475	7-16-37	12-1-37	West Quoddy Head, Me.	Released
37-654507	7-16-37	9-27-37	Campobello, N.B.	Caught Hurt
37-654515	7-16-37	Sept.-37	Shediac, N.B.	Killed
37-654632	7-16-37	5-19-38	Apalachicola, Fla.	Caught
37-654693	7-16-37	11-27-37	Moncton City, N.B.	Found Hurt Died
37-654732	7-16-37	2-16-38	North Head, Grand Manan	Found Dead
37-654742	7-16-37	12-16-37	Melbourn, Fla.	Found Hurt
37-654806	7-18-37	8-22-38	Dorchester, Mass.	Caught
37-654908	7-18-37	4-8-38	Mobile, Ala.	Found Hurt Died
37-654941	7-18-37	9-25-37	Perry's Point, N.B.	Found Dead
37-655162	7-19-37	4-24-38	Northport, L.I., N.Y.	Found Dead
37-655166	7-19-37	July-37	Grand Manan, N.B.	Killed
37-655206	7-19-37	3-25-38	Ocean Drive, S.C.	Shot
37-655224	7-19-37	10-2-37	E. Boston, Mass.	Found Sick, Released
37-655261	7-19-37	6-27-38	Eastport, Maine	Caught
37-655322	7-19-37	2-5-38	Brooklyn, N.Y.	Found Dead

Number	Banded	Recovered	Place of Recovery	How Recovered
37-655388	7-19-37	1-25-38	Casco Bay, Me.	Found Dead
37-655402	7-19-37	12-29-37	New York City	Found Hurt
37-655434	7-19-37	1-29-37	Rockaway Point, L.I.,N.Y.	Found Dead
37-655581	7-20-37	2-15-38	Ricker's I., N.Y.C.	Found Dead
37-655638	7-20-37	10-21-37	FlaglerCo., Fla.	Found Dead
37-655639	7-20-37	11-17-37	Boston, Mass.	Found Weakened
37-655675	7-20-37	12-12-37	Brooklyn, N.Y.	Found Dead
37-655753	7-20-37	3-5-38	Andrews Sound, Ga.	Found
37-655840	7-20-37	9-20-37	Eastport, Me.	Prob. Found Dead
37-655850	7-20-37	6-8-38	Charlotte, Vt.	Found Dead
37-655882	7-20-37	5-11-38	Near Biloxu, Miss.	Netted Released
37-655914	7-20-37	9-11-37	Cape Ray Lighthouse, Nfld.	Caught
37-655980	7-20-37	9-12-37	Castalia, Grand Manan	Found Dead
37-656022	7-20-37	5-8-38	Near Rehobeth, Md.	Found Dead
37-656077	7-20-37	10-9-37	Castalia, G.M., N.B.	Found Dead
37-656120	7-21-37	3-21-38	Port St. Joe, Fla.	Found
37-656302	7-21-37	Summer-37	North Head, G.M., N.B.	Found Dead?
37-656422	7-21-37	5-8-38	Fairport Harbor, Ohio	Found Dead
37-656447	7-21-37	10-14-37	Lubec, Me.	Capt'd Alive
37-656479	7-21-37	9-1-38	West Chatham, Mass.	Found Dead
37-656524	7-21-37	10-1-37	Boston Harbor, Mass.	Found Dead
37-656665	7-21-37	10-1-38	Point Pleasant, N.J.	Found Dead
37-656779	7-21-37	9-28-37	Ocean Drive Beach, S.C.	Caught
37-656912	7-24-37	10-3-38	P.E.Is., Canada	Found Dead
37-656944	7-24-37	8-29-38	Deep Brook, N.S.	Found Dead
37-656947	7-24-37	9-11-37	Red I., via Burgeo,Nfld.	Killed
37-656966	7-24-37	11-14-37	Boyonne, N.J.	Found Dead
37-657126	8-27-37	3-9-38	Provincetown, Mass.	Found Dead
37-657128	8-27-37	8-6-38	Briar Is., N.S.	Caught Released
37-657148	8-27-37	8-3-38	Tiverton, Digby Co., N.S.	Caught on Trawl
37-657162	8-27-37	3-12-38	Andrews, Md.	Caught Released
37-657305	8-29-37	6-7-38	Portland, Me.	Captured
37-657349	8-29-37	3-7-38	Brunswick, Ga.	Found Dead
37-657452	8-29-37	9-18-38	Cliff Is., Me.	Found Dead
37-657637	8-28-37	1-28-38	Sabine Refuge, La.	Caught Rat Trap
37-657700	8-28-37	10-2-37	Campobello Is., N.B.	Prob.Found Dead
37-657773	8-28-37	7-16-38	Plymouth, Mass.	Found Dead
38-669534	7-25-38	9-18-38	Chester Bay, N.S.	Found Crippled
38-669973	8-1-38	9-10-38	Shoe Cove, N.S.	Killed
38-670362	8-13-38	8-25-38	North Head, G.M., N.B.	Found Dead
38-670386	8-13-38	8-18-38	Freeport, N.S.	Found
38-670686	8-8-38	8-11-38	Grosses Coque, N.S.	Found
38-670828	8-13-38	8-18-38	Minister's Is., N.B.	Found Dead
38-671465	7-20-38	10-18-38	Bridgeport, Conn.	Washed Ashore
38-672047	8-5-38	9-8-38	Victoria Beach, N.S.	Found
38-672047	8-5-38	Aug.-38	Near Bigby Gap, N.S.	Found Dead
38-672070	8-13-38	8-25-38	Campobello Is., N.B.	Found Dead
38-672078	8-13-38	9-20-38	North Head, G.M., N.B.	Found Dead
38-672085	8-13-38	8-26-38	Deer Is., N.B.	Found Dead
38-672167	8-12-38	8-31-38	Campobello Is., N.B.	Found Dead

Number	Banded	Recovered	Place of Recovery	How Recovered
38-672289	8-22-38	10-5-38	East Ship Harbor, N.S.	Found Dead
38-672472	8-30-38	9-15-38	Ingalls Head, G.M., N.B.	Found Dead
38-672533	8-14-38	8-18-38	Freeport, N.S.	Found

SIGHT RECOVERIES
of
Herring Gulls banded at Kent Island

1937 Immature

Date	Place of Recovery	Number
9-1-37	Lubec, Maine	6
10-3-37	New York, N.Y. (Fulton Fish Market)	1
10-7-37	New York, N.Y. (Van Cortlandt Park)	1
10-10-37	Lindenhust, L.I., N.Y. (Fishing Boat)	1
10-17-37	Rockaway, L.I., N.Y.	1
10-17-37	Freeport, L.I., N.Y.	1
10-23-37	Brooklyn, N.Y. (Floyd Bennett Dump)	1
10-23-37	Rockaway Point, L.I., N.Y.	1
10-31-37	Freeport, N.Y.	1
10-31-37	Brooklyn, N.Y.	1
11-20-37	Warren, R.I.	1
11-25-37	Brooklyn, N.Y.	4
11-27-37	Rockaway, N.Y.	1
11-28-37	Newburyport Harbor, Mass.	1
12-4-37	Brooklyn, N.Y.	3
12-5-37	Bronx, N.Y.	2
12-11-37	Bronx, N.Y.	2
12-11-37	Brooklyn, N.Y.	2
12-11-37	Brooklyn, N.Y.	7
12-12-37	Brooklyn, N.Y.	1
12-21-37	Brooklyn, N.Y.	10
12-22-37	Darien, Conn.	1
12-24-37	Brooklyn, N.Y.	2
1-14-38	Savannah, Ga.	1
1-15-38	Savannah, Ga.	1
1-16-38	Savannah, Ga.	1
1-22-38	Savannah, Ga.	1
1-29-38	Savannah, Ga.	1
1-30-38	Savannah, Ga.	1
2-19-38	Savannah, Ga.	1
3-3-38	Savannah, Ga.	1
3-20-38	Savannah, Ga.	1
3-21-38	Savannah, Ga.	1
3-24-38	Savannah, Ga.	1
4-2-38	Savannah, Ga.	1
4-6-38	Savannah, Ga.	1
4-11-38	Savannah, Ga.	1
4-12-38	Savannah, Ga.	1
4-16-38	Savannah, Ga.	1
4-19-38	Savannah, Ga.	1
4-20-38	Savannah, Ga.	1

Date	Place of Recovery	Number
4-23-38	Brooklyn, N.Y.	4
8-14-38	Moriches Inlet, L.I., N.Y.	1
8-30-38	Atlantic Beach, N.Y.	1
9-11-38	Montauk Point, N.Y.	1
9-17-38	Brooklyn, N.Y. (Floyd Bennett Field)	1
9-22-38	Atlantic Beach, L.I., N.Y.	1
9-25-38	Provincetown, Mass.	1
10-1-38	Boston, Mass.	1
10-1-38	Beach Haven, N.J.	1
10-8-38	Cape May, N.J.	1
10-26-38	Cape May, N.J.	1
10-28-38	Brooklyn, N.Y.	2
11-5-38	Brooklyn, N.Y.	1
11-5-38	New York, N.Y.	1
11-5-38	Boston, Mass.	1
11-6-38	Brooklyn, N.Y.	8
11-8-38	Brooklyn, N.Y. (Remsen Ave.)	1
11-8-38	Brooklyn, N.Y. (Floyd Bennett Airport)	6
11-11-38	Brooklyn, N.Y. (Floyd Bennett Airport)	6
11-11-38	Brooklyn, N.Y. (Remsen Ave.)	2
11-11-38	New York, N.Y. (Fulton Fish Market)	1
11-12-38	Bronx, N.Y.	1
11-13-38	Bronx, N.Y.	1
11-13-38	Brooklyn, N.Y. (Floyd Bennett Airport)	4
11-15-38	New York, N.Y.	1
11-20-38	Brooklyn, N.Y. (Floyd Bennett Field)	2
11-20-38	Brooklyn, N.Y. (Penna. Ave.)	2
11-20-38	Manasquen, N.J.	1
11-26-38	Brooklyn, N.Y.	5
11-27-38	Freeport, N.Y.	2
11-27-38	Atlantic City, N.J.	2
12-3-38	Bronx, N.Y.	1
12-4-38	Brooklyn, N.Y.	5
12-4-38	South Norwalk, Conn.	1
12-4-38	Manasquen Inlet, N.J.	1
12-10-38	Brooklyn, N.Y.	2
12-11-38	South Norwalk, Conn.	1
12-11-38	Bronx, N.Y.	2
12-17-38	Brooklyn, N.Y.	1
12-24-38	Brooklyn, N.Y.	1
12-29-38	New York, N.Y. (Fulton Fish Market)	1
12-30-38	New York, N.Y. (Fulton Fish Market)	2
12-30-38	Brooklyn, N.Y.	3
1-2-39	Warren, R.I.	1
1-6-39	New York, N.Y. (Fulton St. and East River	1
1-16-39	Warren, R.I.	1
1-28-39	Brooklyn, N.Y. (Floyd Bennett Field)	4
1-31-39	New York, N.Y. (Fulton St. and East River	1
	Total	163

1937 Adults

Date	Place of Recovery	Number
10-16-38	Atlantic Beach, N.Y.	2
10-30-38	Atlantic Beach, N.Y.	1
11-12-38	Long Beach, N.Y.	1
11-13-38	Bronx, N.Y.	1
11-20-38	Shark River Inlet, N.J.	1
12-15-38	New York, N.Y.	1
		7

1938 Immature

9-25-38	Provincetown, Mass.	1
10-2-38	Provincetown, Mass.	4
10-17-38	Cape May, N.J.	1
10-19-38	Cape May, N.J.	3
10-20-38	Cape May, N.J.	3
10-23-38	New York, N.Y. (Hudson River)	1
10-25-38	Cape May, N.J.	1
10-26-38	Cape May, N.J.	1
10-26-38	Wildwood, N.J.	1
10-27-38	Cape May, N.J.	1
10-28-38	Brooklyn, N.Y.	2
10-31-38	Warren, R.I.	1
11-5-38	Boston, Mass.	1
11-6-38	New York, N.Y.	2
11-6-38	Brooklyn, N.Y.	2
11-6-38	New York, N.Y. (Fulton Fish Market)	1
11-8-38	Brooklyn, N.Y. (Floyd Bennett Airport)	5
11-11-38	Brooklyn, N.Y. (Floyd Bennett Airport)	4
11-11-38	Brooklyn, N.Y. (Remsen Ave.)	2
11-11-38	New York, N.Y. (Fulton Fish Market)	2
11-13-38	Brooklyn, N.Y. (Floyd Bennett Airport)	4
11-13-38	Bronx, N.Y.	5
11-20-38	Brooklyn, N.Y. (Floyd Bennett Airport)	5
11-20-38	Brooklyn, N.Y. (Penna. Ave.)	5
11-12-38	New York, N.Y.	1
11-12-38	Bronx, N.Y.	2
11-19-38	New York, N.Y. (Fulton Fish Market)	1
11-19-38	Brooklyn, N.Y.	1
11-26-38	New York, N.Y. (Fulton Fish Market)	2
11-26-38	Brooklyn, N.Y. (Penna. Ave.)	1
11-27-38	Freeport, N.Y.	1
11-27-38	Atlantic City, N.J.	1
11-30-38	New York, N.Y. (Fulton Fish Market)	2
11-30-38	Brooklyn, N.Y.	1
12-1-38	Ft. Pierce, Fla.	1
12-3-38	Brooklyn, N.Y.	3
12-3-38	Bronx, N.Y.	2
12-4-38	South Norwalk, Conn.	1
12-4-38	Brooklyn, N.Y.	9
12-4-38	Ft. Pierce, Fla.	1
12-7-38	New York, N.Y. (Fulton Fish Market)	2
12-10-38	Brooklyn, N.Y.	2
12-11-38	Bronx, N.Y.	3
12-17-38	New York, N.Y. (Fulton Fish Market)	1

1938 Immature (con.)

12-17-38	Brooklyn, N.Y.	1
12-21-38	New York, N.Y. (Fulton Fish Market)	1
12-24-38	Brooklyn, N.Y.	9
12-26-38	Bronx, N.Y.	1
12-26-38	Brooklyn, N.Y.	2
12-29-38	New York, N.Y. (Fulton Fish Market)	1
12-30-38	New York, N.Y. (Fulton Fish Market)	1
12-30-38	Brooklyn, N.Y.	4
12-31-38	New York, N.Y. (Fulton Fish Market)	1
1-4-39	Warren, R.I.	1
1-7-39	Warren, R.I.	1
1-8-39	Point Pleasant, N.J.	1
1-12-39	New York, N.Y. (Fulton St. and East R.)	1
1-13-39	New York, N.Y. (Fulton St. and East R.)	1
1-14-39	New York, N.Y. (Fulton St. and East R.)	1
1-16-39	Warren, R.I.	1
1-20-39	Bradenton Bay, Fla.	1
1-24-39	New York, N.Y. (Fulton St. and East R.)	1
1-25-39	New York, N.Y. (Fulton St. and East R.)	1
1-27-39	New York, N.Y. (Fulton St. and East R.)	1
1-28-39	Brooklyn, N.Y. (Remsen Ave.)	2
1-28-39	Brooklyn, N.Y. (Floyd Bennett Field)	4
	Total	134

1938 Adults

10-27-38	Warren, R.I.	1
10-28-38	Brooklyn, N.Y.	1
11-6-38	New York, N.Y.	1
11-6-38	Little Neck Bay, N.Y.	1
11-8-38	Brooklyn, N.Y. (Floyd Bennett Airport)	2
11-11-38	Brooklyn, N.Y. (Floyd Bennett Airport)	1
11-11-38	Brooklyn, N.Y. (Remsen Ave.)	1
11-20-38	Brooklyn, N.Y. (Floyd Bennett Airport)	1
11-20-38	Brooklyn, N.Y. (Remsen Ave.)	1
12-3-38	Point Pleasant, N.J.	1
12-4-38	Brooklyn, N.Y.	3
12-4-38	Manasquen Inlet, N.J.	1
12-17-38	Brooklyn, N.Y.	2
12-26-38	North Wildwood, N.J.	1
	Total	18

Grand Total 322

PARASITES OF THE HERRING GULL LARUS ARGENTATUS SMITHSONIANUS

(by Robert W. Harrington Jr., Bowdoin 1934)

This is a summation of data obtained in the summer of 1937. A preliminary report of this project may be found in the 1938 Bulletin of the Kent's Island Station, (Harrington and Pillsbury, The Parasitology of the Herring Gull).

In the preliminary report, the technique is outlined, and an estimate of the proportions in which the different classes of helminths occurred is added. An examination of the present report, which purports to be an extension, correction, and completion of the preliminary one, will reveal the errors of the estimate.

Moreover, the author wishes to caution the reader further, in the interpretation of the following data. Employing a more painstaking technique the following summer (1938), he examined about as many more gulls. Several facts indicating the probable inadequacy of the data in Table I and in the List of Species came to light. These are: (1) Each bird examined contained parasites. (2) Each bird contained several species. (3) The almost consistent presence of nematodes in oesophagus, proventriculus, or gizzard. (4) The cestodes were more intact. All this indicates that the "flushing" technique, employed the first summer, and described in the preliminary report, evidently failed to dislodge the more tenacious specimens, and tended to disrupt the cestodes into progblottid fragments, rendering complete identification impossible.

Explanation of Table I

B, in the first column, refers to B in the List of Species, i.e. to Strigea bursigera. B was found in 2 out of the 44 birds examined, therefore, it "occurred" in 5% of the 44 birds. B was found in bird no. 30, collected July 23, and in bird no. 36, collected August 21.

Work in progress from the Summer of 1938

The weights and measurements of each bird examined this summer are recorded on the chart included in this Bulletin.

In addition to the helminths, the ectoparasites were collected, and smears of the blood of twenty birds were made. The ectoparasites and smears have been sent to Dr. Carleton Herman for identification. The helminths await identification.

Trematodes were collected from the intestine, the vessels of the liver, the pancreas, and from the bile duct; nematodes from the oesophagus, proventriculus, and gizzard; acanthocephalids from the intestines; cestodes from the intestines and a couple from the bile duct.

In the majority of cases, the gizzards were devoid of food. In the gizzard, herring were most frequently found. Also found

there were: plates of sea urchins, crustaceans, grass, pebbles, in one case, numerus insect larvae. In the oesophagus of a sick gull 36 queens and 2 works of Camponotus herculeanus pennsylvanicus were found.

On Kent Island every day, many gulls may be picked up in so weak and sick a condition that they remain practically motionless. Dr. Herman suggested that I treat some of these birds with fresh water in consideration of the work of Kalmbach and his coworkers with botulism in ducks. Some of the birds so treated improved from so weak a condition that they could not rise to their feet to the point of running vigorously about their cages. I was unable to devote much time to this problem, and subsequently some of the birds which responded so readily to this treatment died suddenly overnight. Kent Island affords an unusual opportunity for studies of this nature as the large size of the gull colony insures a proportionate supply of sick gulls.

List of Species

TREMATODA

A. Ornithobilharzia lari (McLeod, 1937)
B. Strigea bursigera (Brandes, 1890)
C. Himasthla elongata (Mehlis, 1831)
D. Diplostomum huronense (LaRue, 1927)
E. Cryptocotyl lingua (Creplin, 1825)
F. Gymnophallus deliciosus (Olsson, 1893)
G. Cosmocephalus sp.

CESTODA

H. Hymenolepis sp.
I. Hymenolepis sp., probably H. fusus (Krabbe, 1869)
J. Hymenolepis sp., probably H. ductilis (Linton, 1927)
K. Tetrabothrius sp.
L. Tetrabothrius sp., probably T. cylindraceus (Rudolphi, 1819)
M. Tetrabothrius sp., probably T. erostris (Lonnberg, 1889)
N. Chaonotaenia sp.
O. Chaonotaenia sp., probably C. ransomi (Linton, 1927)
P. Chaonotaenia ransomi (Linton, 1927)
Q. Chaonotaenia sp., probably C. porosa (Rudolphi, 1810)

NEMATODA

R. Aniskinae larvae, probably "Ascaris capsularia"

ACANTHOCEPHALA

S. Fillicollis, probably sphaerocephalus
T. probably Prosthorynchus sp.

The author wishes to thank Mr. J. T. Lucker, Dr. P.D. Harwood, Dr. E.W. Price, and Mr. Allen McIntosh of the Bureau of Animal Industry, Department of Agriculture, in Washington for identifying the specimens.

TABLE 1

Refer to list of Species	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
Occurrence of Parasites (No.)	11	2	2	1	1	8	2	6	11	2	8	2	2	8	1	2	1	1	1	2
(No. & % of Birds) %	25	5	5	2	2	18	5	14	25	5	18	5	5	18	2	5	2	2	2	5
8/1/36																			X	
3/1/37																				
6/16/37														X						X
6/17/37										X					X					
6/28/37																				
7/2/37																				
7/2/37																				
7/3/37																				
7/3/37	X																			
7/3/37									X		X									
7/4/37	X																			
7/4/37	X																			
7/5/37																				
7/6/37													X			X				
7/6/37	X								X					X						
7/6/37								X	X											
7/6/37																				
7/6/37										X										
7/10/37				X																
7/15/37	X													X						
7/15/37									X		X									
7/15/37								X	X											X
7/15/37					X								X							
7/15/37			X																	
7/20/37									X											
7/20/37									X											
7/23/37			X			X		X								X				
7/23/37	X							X			X									
7/23/37						X					X									
7/23/37	X	X							X											
7/26/37																				
8/11/37								X												
8/13/37							X							X						
8/20/37	X					X														
8/20/37												X		X						
8/21/37		X				X			X					X						
8/21/37						X						X					X	X		
8/22/37	X					X					X									
8/22/37																				
8/23/37	X								X					X						
8/23/37	X					X			X					X						
8/23/37						X		X			X									
8/30/37											X									
9/1/37							X				X									

Each number refers to a particular Gull examined
Adjacent is the date the bird was collected

CHART 1.

Larus argentatus smithsonianus 1938 Kent's Island, New Brunswick, Canada

Specimen	45	46	47	48	49	50	51	52	53	54	55	56	57	58
Date	6/28	6/28	7/2	7/2	7/3	7/3	7/5	7/5	7/5	7/6	7/7	7/9	7/10	7/10
Condition	sick	shot	dead	sick	dead	sick	sick	sick	dead	dead	shot	dead	shot	shot
Sex	♀	♂	♂	♀	♂	♂	♀	♀	♂	♂	♂	♂	♂	♂
Weight	762	1178	1014	628	494	980	669	759	1020	935	1302	1097	1326	1140
Total Length	574	654	660	580	629	632	613	573	649	650	678	625	656	634
Extent	1377	1540	1548	1417	1460	1465	1470	1390	1533	1567	1533	1478	1486	1514
Wing	422	425	454	420	436	434	420	387	432	425	475	420	440	453
Tail	180	156	193	185	187	181	185	187	208	173	197	184	187	180
Bill	56	55	63	58	64	61	58	56	64	64	65	60	62	60
Nostril-Bill	27	27	30	27	28	26	28	26	30	31	32	28	30	29
Eye-bill	82	83	91	80	90	91	83	78	92	92	94	88	92	88
Tarsus-toe	134	123	142	120	137	134	120	119	129	141	144	124	135	141
Third-toe	60	60	70	59	63	61	61	60	65	65	63	66	72	67
Tarsus	74	63	72	61	74	68	59	59	64	75	81	58	63	74
3rd Toe nail	11	11	11	11	11	11	11	11	11	12	11	12	11	12
Gonads	12x7 2	20x10	6x10	10x15 3	16x7 1	10x6	11x9 3	15x10 3	10x8	9x6	9x6	10x5	14x7	12x8

Specimen	59	60	61	62	63	64	65	66	67	68	69	70	71	72
Date	7/10	7/10	7/10	7/12	7/13	7/14	7/16	7/17	7/19	7/19	7/20	7/22	7/25	7/25
Condition	shot	shot	shot	shot	sick	shot	injd	injd	sick	injd	dead	shot	shot	shot
Sex	♀	♂	♂	♂	♂	♂	♀	♀	♂	♂	♂	♂	♂	♀
Weight	932	1060	1120	1250	986	1036	726	749	1000	930	996	1098	1068	820
Total Length	582	613	632	642	619	628	592	587	637	632	624	650	694	601
Extent	1368	1473	1479	1457	1509	1466	1373	1327	1496	1350	1453	1459	1492	1429
Wing	417	417	436	442	433	442	404	390	430	438	436	430	425	420
Tail	168	181	179	175	179	175	174	194	182	182	181	175	180	176
Bill	54	56	61	60	54	64	57	55	62	61	59	62	60	56
Nostril-Bill	26	27	28	28	26	27	27	25	29	27	30	28	28	27
Eye-bill	79	84	92	89	85	88	84	80	90	90	92	70	92	83
Tarsus-toe	121	132	134	136	134	135	128	118	137	132	134	137	139	126
Third-toe	63	68	67	66	68	68	64	61	72	68	68	61	65	63
Tarsus	58	64	67	70	66	67	64	57	65	64	66	76	74	63
3rd Toe nail	10	11	11	11	11	12	9	9	13	9	12	10	11	11
Gonads	15x6 2	10x5	11x6	9x5	8x5	10x8	8x7 3	16x15 6	7x4	9x6	7x5	7x4	7x4	13x10 6

Specimen	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Date	7/26	7/27	7/27	7/27	7/28	7/29	7/29	7/29	7/31	8/1	8/1	8/1	8/1	8/2
Condition	dead	shot	dead	dead	shot	shot	dead	dead	injd	dead	shot	shot	shot	dead
Sex	♂	♂	♀	♀	♀	♂	♂	♂	♀	♂	♀	♂	♂	♂
Weight	765	1250	993	582	949	1124	652	805	925	846	896	1100	739	708
Total Length	611	686	625	559	602	638	639	637	618	658	593	619	640	636
Extent	1502	1565	1444	1414	1481	1495	1534	1559	1452	1534	1430	1483	1504	1516
Wing	450	446	406	397	413	426	439	441	410	440	432	423	440	427
Tail	185	192	170	161	172	181	182	185	172	179	175	182	182	180
Bill	62	68	55	57	55	59	61	58	52	63	55	60	64	60
Nostril-Bill	31	33	28	26	27	28	27	25	24	31	26	29	30	28
Eye-bill	90	101	87	83	84	90	89	86	81	95	83	80	87	88
Tarsus-toe	133	145	124	123	127	131	135	142	123	130	121	130	128	127
Third-toe	69	67	59	57	60	63	68	69	57	63	61	64	65	64
Tarsus	64	77	65	66	67	68	67	73	74	67	60	66	63	63
3rd Toe nail	11	12	10	10	11	11	12	11	10	12	11	12	12	11
Gonads	7x4	8x11	22x10 3	14x10 2	11x10 3	7x4	7x5	6x4	16x14 3	7x4	13x8 5	5x10	6x4	6x4

CHART 2.

Weights in grams Lengths in millimeters

		No.	Average
Weight (Sick includes injured, sick + dead of chart 1.)	All specimens	42	955.0
	All well specimens	18	1077.4
	Well males	14	1128.3
	well females	4	899.2
	All sick specimens	24	863.2
	sick males	16	928.4
	sick females	9	754.8
Total Length	All specimens	42	626.5
	males	29	639.7
	females	13	593.8
Extent	All specimens	42	1472.5
	males	29	1496.6
	females	13	1415.0
Wing	All specimens	42	426.0
	males	29	433.2
	females	13	409.8
Tail	All specimens	42	180.8
	males	29	183.2
	females	13	175.3
Bill	All specimens	42	59.4
	males	29	61.1
	females	13	55.7
Nostril-Bill	All specimens	42	28.0
	males	29	28.7
	females	13	26.5
Eye-Bill	All specimens	42	87.5
	males	29	90.0
	females	13	82.0
Tarsus-toe	All specimens	42	131.0
	males	29	134.5
	females	13	123.0
Third Toe	All specimens	42	64.3
	males	29	66.0
	females	13	60.6
Tarsus	All specimens	42	66.8
	males	29	68.3
	females	13	63.6
Third Toe-nail	All specimens	42	11.0
	males	29	11.3
	females	13	10.3
Gonads	testes	29	9.3x5.7
	ovaries	13	15.6x9.4
	ova	13	8.2

SURVEY OF THE FOOD OF FOUR FISHES OF THE BAY OF FUNDY

(by: Richard H. Stroud Bowdoin 1939.)

The feeding habits of our fishes are of great import to the biologist and fisherman. Food is a very important factor in determining the migrations of this valuable resource. It is, moreover, fairly apparent that the determiners of many diseases which strike fish may be bound closely to the food cycles. It seems urgent, therefore, if we are to aid in the perpetuation of the fishing industry for future generations, to gather every small bit of information which will lead to a more complete knowledge of the life cycles of these animals.

This survey deals with three fishes of commercial value, the Haddock, the Cod, the Pollock, and also the Rock Eel. I shall consider the latter first and then the food fishes in the order named. The first three are those commercial fishes most frequently caught by the hand-line and trawl fishermen in the vicinity of Three Islands, White Head, and neighboring islands. The fish were all taken from this region in fairly shoal water, in no case much exceeding forty fathoms. The Rock Eels were taken from under rocks lying between tide marks on the shores of Three Islands. The bait used to catch the pelagic fishes was, in every case, Herring. In those instances where the bait was swallowed it has been included, with footnotes to that effect.

Food of the Rock Eel (Pholis gunnellis)

The Rock Eel assumes a more important niche in biology with the gathering of each new fact about it. It is known to form a large percentage of the diet of the guillemot and other sea birds, and many fish, particularly the Cod, depend upon this species, in regions where it is abundant, to form a substantial portion of the diet.

I base my figures, in the following table, on the stomach content of one hundred fish. I collected fifty on July 11, twenty-eight on July 16, four on July 29, and the rest on August 3, all in 1938.

General classification	Name of order	Name of genus	Number eating food	Percentage of total	
Annelids	Polychaeta	*Oridia	20	2.37	2.37
Crustaceans	Amphipoda	Gammarus	80	82.10	
		Leptocheirus	9	1.91	
	Isopoda	Edotea	17	0.89	
		Jaera	16	4.67	89.57
Chlorophyceae		Ulva, Vaucheria	46	2.67	2.67
*Insect larvae	(?coleopterous)		33	5.39	5.39
				100.00	100.00

*Identification by courtesy of Miss Olga Hartman of the University of Southern California. Miss Hartman suggests that the larvae may be coleopterous and that the species of Oridia, although positive identification is impossible, is probably sabellid.

I should judge, considering the small amount concerned and the large number of individuals included, that the algae was assimilated incidentally to the capture of the crustaceans.

Three individuals were gorged, exclusive of other food, on the insect larvae. These were from the group collected on July 16. It is interesting to note, in this connection, that of the fifty collected prior to this date thirteen had fed on these larvae; whereas, of the fifty collected on or after the same date twenty had fed on it. The amount of the larvae contained in the stomachs of the latter group exceeded by nearly six times that found to be present in the stomachs of the former group. Five were gorged on Oridia. In this case the situation is reversed, for seventeen of the first fifty, collected July 11, fed on the annelid; whereas, only three of the last fifty, collected on or after July 16, had taken it. The amount consumed by the first group was very nearly six times that consumed by the remaining fifty.

I was quite dependent, in filling my needs for fish (other than Rock Eels), on getting to the fish piers at White Head for my stomach collections. Since my trips were, unfortunately, rather infrequent, I was forced to collect large quantities of material at a time. This prevented my taking a more significantly representative sample of the food assimilated by these fish throughout the summer months. I am indebted, in the collection of this material, to my good friend Douglas Robinson for his helpful assistance.

Food of the Haddock (Melanogrammus aeglefinus)

My figures, in the following table, are based on the stomachs contents of twenty-six fish collected July 20, 1938. It was not possible, although I tried several times more, to secure additional material.

General classification	Name of order	Name of genus	Number eating food	Percentage of total	
Annelids	Polychaeta	*Nereis (pelagica)	26	24.440	
		Nereis (virens)	11	0.820	
		*Chone	6	11.680	36.94
Arachnoideans	Pycnogonida	Nimphon	5	0.078	
		Pycnogonum	9	1.742	1.82
Coelenterates	Zoantharia		15	4.800	4.80
Crustaceans	Decapoda	Cancer	2	0.069	
		Pelia	1	0.022	
		Pagaurus	6	1.690	
		Crangon	6	1.713	
	Amphipoda	Caliopus	2	0.017	
		Hyperia	2	0.009	
		Gammarus	6	0.260	3.78
Echinoderms	Spinulosa	Asterina	9	0.785	
		Solaster	3	0.083	
	Ophiurae		21	45.332	46.20

*Identification by courtesy of Miss Olga Hartman who gives the species of Chone as infundibuliformis Kroyer, of Nereis as pelagica.

Mollusks	Filibranchiata Modilaria	3	0.030	
	Eulamelli-branchiata Cardium	7	0.510	
	Polyplacophora Tonicella	2	0.040	0.58
Fish	*Herring	9	5.710	
	3-Bearded Rockling	1	0.170	5.88
			100.000	100.00

*Cut bait in seven individuals

The stomach of one individual contained 2 nematodes. There were small amounts of gravel in nearly every stomach.

C. infundibuliformis, although appearing in only six individuals formed 11.68%. This was due to the fact that five of them were simply packed with this annelid to the exclusion of all else. The Aracnoideans are Nimphon longitarse Kroyer, and Pycnogonum littorale Strom, the sea spiders. The sea anemones belong to families Paractidae, and Sagartiidae, solitary types, and were in every case too far digested to permit of a more complete diagnosis. I found the following specific identifications of Decapods possible: Cancer irroratus Say, the common rock crab of the New England coast; Pelia mutica (Gibbes), the small spider crabs, very common farther south around Cape Cod; Pagaurus longicarpus Say, the familiar small hermit crab; and Crangon vulgaris Fabricus, the edible shrimp. Order Ophiurae, the brittle stars, was well represented as to variety, for there were five families: Ophiocanthidae, Amphiuridae, Ophiodermatidae, Ophiolepididae, and Ophioeomidae. Further identification was impossible. A very small percentage composed of Modilaria, the mussels, Cardium, and Tonicella, the rock chitons, must serve to represent the mollusks.

Food of the Cod (Gadus callarias)

The Cod, being the most common fish in the Bay of Fundy, is the mainstay of the fishing industry. Adequate material of this species was not lacking and, as a result, I collected the stomachs of one hundred fish, upon which my figures are based. I caught one on June 29, another on July 4, secured fifty-two at White Head on July 20, and the rest on August 7, 1938.

General classification	Name of order	Name of genus	Number eating food	Percentage of total	
Annelids	Polychaeta	Nereis	3	0.006	
		*Nereis	12	0.874	0.880
Arachnoideans	Pycnogonida	Pycnogonum	14	1.890	1.890
Coelenterates	Zoantharia		39	2.250	2.250
Crustaceans	Decapoda	Cancer	25	6.950	
		Crangon	27	2.595	
		Hippolyte	48	54.595	
		Pelia	29	2.460	66.600

Echinoderms	Ophiurae	33	2.980	2.980
Fish	#Herring	23	14.857	
	Capelin	2	0.086	
	3-Bearded Rockling	23	7.980	
	Winter Flounder	1	0.072	
	Rock Eel	12	2.348	
	Lamprey Eel	1	0.057	25.400
			100.000	100.000

*Identification by courtesy of Miss Olga Hartman of the University of Southern California. She gives the species as N. pelagica
#Cut bait in five individuals.

The stomachs of 29 Cod contained 142 nematodes, and three had six cestodes. Many stomachs contained small amounts of gravel. Mollusks were represented in a single fish by the presence of two small mussels. A fisherman gave me a small lobster with a carapace measuring four inches which he said he found in a Cod's "poke".

The stomachs of two Cod of twelve that ate N. pelagica held five-sixths of the total quantity eaten. The Pycnogonum (species, in this case, littorale), when eaten, were usually consumed in large amounts at a time, three fish being gorged on the sea spiders. Order Zoantharia, the sea anemones, was represented by three families, all solitary forms: Paractidae, Sagartiidae, and Bunonidae. Again, destruction of important characters by the digestive acids prevented more precise identification. Order Ophiurae, less important in the diet of the Cod, offers but two families: Ophiocanthidae, and Ophiocomidae. Species of Decapods correspond to those of the Haddock: C. irroratus, Cr. vulgaris, and P. mutica; genus Hippolyte did not lend itself, because of its delicate structure and ready digestibility, to specific diagnosis.

An interesting fact which I noticed was that the stomach walls, when surrounding hard-shelled crustaceans and pycnogidans, were tremendously thick and tough; whereas, when the stomach contained prawns and fish, the walls were very thin and delicate.

Food of the Pollock (Pollachius virens)

When a fisherman of the region saved a fish for himself and his family, invariably, it was a Pollock. Inquiries as to the reason for this brought the answer that the Pollock is one of the cleanest fish that swim. This no doubt arises from the fact that it feeds largely on prawns and fish, soft-bodied pelagic forms of animal life, popularly less repulsive than heavily armored bottom forms. The Pollockis, moreover, a very trim, stream-lined fish and its flesh is to a very large extent free from the burrowing round worms that infest the meat of a Cod. I found, however, a large number of nematodes in the stomachs of Pollock.

The values in the following table are based on the stomach contents of seventy-seven fish. I collected the first nineteen on July 20, and the rest on August 7, 1938.

General classification	Name of order	Name of genus	Number eating food	Percentage of total	
Annelids	Polychaeta	*Nereis	10	0.019	0.019
Crustaceans	Amphipoda	Hyperia	1	0.001	
		Crangon	2	0.034	
	Decapoda	Pelia	1	0.002	
		Pandalus	73	86.342	86.379
Echinoderms	Ophiurae		2	0.002	0.002
Fish	#Herring		27	13.567	
	3-Bearded Rockling		1	0.033	13.600
				100.000	100.000

*Identification by courtesy of Miss Hartman, the species given as N. pelagica.
#Cut bait in eleven individuals.

The stomachs of 50 Pollock contained 172 nematodes. One Pollock had one P. littorale which is strictly a bottom form, normally hiding underneath rocks. The species of Hyperia was medusarum, found in Cyanea and other jelly fish along the coast. The species of Crangon is vulgaris and that of Pelia is, again, mutica. I was unable to establish, due to the advance of digestion, the species of Pandalus, the genus of the common deep water prawns. As a word of explanation it should be stated that many such forms are so delicate that, by the time the fishermen discharge their catches on the fish piers, the acids of digestion have destroyed important characters, negating, in many cases, the possibility of accurate diagnosis beyond one of the larger divisions of classification. The brittle stars, to continue, were represented by families Ophiocanthidae, and Amphiuridae. A single rock chiton in one fish and two small Prosobranchiates in another individual served to represent the Mollusks.

I should like, in conclusion, to summarize briefly for purposes of comparison the food of the Haddock, the Cod, the Pollock in a convenient table based on the major divisions of my classification.

	Haddock	Codfish	Pollock
Annelids	36.94%	0.88%	0.019%
Arachnoideans	1.82	1.89	Trace
Coelenterates	4.80	2.25	- - -
Crustaceans	3.78	66.60	86.379
Echinoderms	46.20	2.98	0.002
Mollusks	0.58	Trace	Trace
Fish	5.88	25.40	13.600
	100.00%	100.00%	100.000%

The reader must bear in mind, as I do, that this survey may, because of the circumstances of collection already explained, well be biased. The fact that some individuals of a group, collected at an earlier or later date than some other group, may be

gorged on some particular food should be of great significance. A much more extensive program of investigation than I was able to conduct might bring this out in striking relief.

HOMING EXPERIMENTS WITH LEACH'S PETRELS ON KENT ISLAND
(by Donald R. Griffin)

Fred Greeley, Douglas Robinson, and the writer spent the major part of their time from June 20th to August 15th, 1938, studying the homing instinct of the Leach's petrel. This bird is one of the most interesting of the Island's inhabitants, although it could easily escape observation because it is entirely nocturnal in its habits. Nesting in burrows in the woods of the Island and scarcely ever appearing near shore except between the hours of 10.00 p.m. and 5.00 a.m. this bird's habits are as bazaar as those of any of our local avifauna.

Homing instincts of birds present many unsolved problems to the biologist. Various species of wild birds will, like the domesticated homing pigeon, return directly to their nests when artificially transported to a distance. Noddy, sooty, and arctic terns, herring gulls, starlings, swallows, shearwaters and storks are some of the species which have been shown to be capable of returning to their nests when carried hundreds of miles away. The birds may be carried in closed boxes from which they can see nothing of their surroundings and yet their ability to return is in no way impaired. It has so far proved impossible to account for this homing ability of birds on the basis of any of the known senses.

It seemed desirable to attempt some further homing experiments with sea birds which could be released far out of sight of land where no previously learned landmarks could be available. The Leach's petrel was chosen for this work because it was small, easily transported, and colonial, so that many could be caught at once and because it nested in short burrows from which the birds could be extracted without resorting to traps. Furthermore, petrels nesting in a foggy area like the Bay of Fundy have a great problem in navigation to face every time they return to their nests from a fishing trip. Petrels always stay far from land until after darkness and on a foggy night it seems difficult indeed to explain how they find a small body of land like Kent or Green Island.

Considerable practical difficulties were encountered when the actual work of catching and transporting petrels was begun. In the first place only about one burrow in five on Kent Island had a pair of birds with an egg, so that five burrows had to be reached into before one bird was caught. The birds were carried to sea on either Canadian National freighters sailing from Halifax to the West Indes or on the Yarmouth to Boston steamer. In all cases intermediate transportation had to be arranged either on the Scientist or on local fishing boats. The radio department, too, was an indispensable aid to these experiments. Many detailed arrangements about schedules of ships' sailings had to be made by telegraph through Mr. Parker of North Head, whose short wave radio carried the messages to Kent Island.

A typical homing experiment would start as follows: At 7.30 in the evening the Radio Department would receive a message saying that a certain fisherman was leaving for Nova Scotia in the morning and would stop off at the Island at 6 a.m. Immediately all hands who could be commandeered were organized into a petrel hunting crew. In addition to the three of us whose regular job it was to catch petrels almost every other member of the expedition served in that capacity on at least one occasion, and their assistance was greatly appreciated. Sam Lacy should receive particular acknowledgment, however, for he volunteered a great amount of time to petrel catching and also to the routine, laborious and uninteresting job of building cages to transport the birds. After gathering all assistance which could be obtained, the petrel hunters would start out into the pitch-black and dew-soaked woods to seek petrel burrows by flashlight, reach into them, put the captured birds into transportation cages, and mark the burrows with numbered wooden markers so that they could be located again later. Since as many as eighty birds were sometimes used in one experiment, it often required the greater part of the night to catch them and prepare the cages for the long journey. It proved impossible to feed petrels in captivity except by hand, and they are able to survive at least four days without food when incubating, for each bird ordinarily spends that time in the nesting burrow before it is relieved by its mate. Water was provided for the birds by the simple expedient of placing a small wet sponge in each compartment of the cage.

The petrels flew back to Kent Island even when released as far as four hundred and seventy miles at sea. Nearly 100% of those released in the Gulf of Maine returned to the Island within ten days, and about 40% of the birds released four hundred and seventy miles away, in the middle of the Gulf Stream, found their way back to the Island. Thus it was apparent that the Leach's petrels had the same type of homing instinct which so many other species of wild birds possess. Certain experimental treatments of the birds were tried in an attempt to discover just what sensory mechanism is involved in their ability to find their way home over these great distances. The details of these experiments would require too much space to describe here, and a full report of these homing experiments will appear in an early number of the Auk.

BIRDS OBSERVED AT KENT ISLAND DURING THE SUMMER OF 1938

(by Ivan Spear, Cape Elizabeth High School '40. Member MacMillan-Arctic Expedition of 1937)

Kent Island offers an excellent opportunity for the study of bird life generally found in more northern localities. Its location in the Bay of Fundy where cold waters tend to lower the temperature, thereby making it suitable for the nesting of certain northern birds, gives the student an excellent opportunity to become familiar with birds seldom found nesting in this latitude. Furthermore Kent Island is situated in the path of one of the major migration routes.

A case of a northern bird nesting where a southern bird would be expected is the Acadian Chickadee which is unusually common in the wooded sections of the island. The Black-capped Chickadee has not been recorded on the island yet, it is common on Grand Manan only seven miles away.

In addition to the many resident birds the shores of the island are visited by thousands of shore birds during the spring and fall migrations. In the winter there are many visitants from the far north. The majority of the wintering birds are various species of ducks but there are also hawks and owls and various smaller birds such as Snow Buntings, Horned Larks and Pipits.

During the summer a record of the birds observed was made and a partial census of a few nesting birds was obtained. A census of the vast numbers of Herring Gulls, Eider Ducks, Guillemots and Leach's Petrel would be of the utmost importance in determining the size of the colonies and the rate of their increase under the present efficient protection given them by the Station Warden, Mr. Ernest Joy.

Birds observed during the course of the summer are listed below in the order in which they were first seen. The resident birds are indicated by the letter R and the transient birds by the letter T.

June 14

1. Barn Swallow R
2. Tree Swallow R
3. Cliff Swallow R
4. Savannah Sparrow R
5. Song Sparrow R
6. Vesper Sparrow R
7. Black-poll Warbler R
8. Yellow Warbler R
9. Myrtle Warbler R
10. Robin R
11. Crow R
12. Northern Raven R
13. Alder Flycatcher R
14. Spotted Guillemot R
15. Black Guillemot R
16. Herring Gull R
17. American Eider Duck R
18. Double-crested Cormorant T
19. American Redstart R

June 15

20. Slate-colored Junco R
21. White-throated Sparrow
22. Bank Swallow R
23. Marsh Hawk R
24. Leach's Petrel R
25. Black-backed Gull R

June 16

26. Northern Yellow-throat R
27. Black-Throated-Green Warbler R
28. Goldern-Crowned Kinglet R

June 18
29 Ruby-crowned Kinglet
30 Olive-backed Thrush R
31 Acadian Chickadee R
32 Wood Pewee T
June 19
33 Goldfinch T
June 20
34 Starling R
June 21
35 Harlequin Duck T
36 Osprey T
June 26
37 Greater Yellow-legs T
38 Common Loon T
39 Nashville Warbler R
June 28
40 Black Duck T
July 6
41 Semi-palmated Plover T
42 Semi-palmated Sandpiper T
July 8
43 Red-backed Sandpiper T
July 9
44 Sanderling T
45 Least Sandpiper T
July 10
46 Swamp Sparrow T
July 18
47 Pintail Duck T
48 Arctic Tern T
July 20
49 Eastern Dowitcher T
July 22
50 Golden Plover T
July 24
51 White-rumped Sandpiper T
52 Hudsonian Curlew T
53 Ruby Turnstone T
July 28
54 Lesser Yellow-legs T
July 31
55 Downy Woodpecker T
56 Common Tern T
57 American Crossbill T
Aug. 3
58 Red Phalarope T
59 Greater Shearwater T
Aug. 9
60 Long-billed Curlew T
Aug. 16
61 Cedar Waxwing T
Aug. 24
62 Eastern Mocking Bird T

A census of nine nesting birds made on June 24 revealed the following:

Name of Bird	Number of eggs in the nest					Number of young in the nest					Contents not determined	Total
	2	3	4	5	6	1	3	4	5	6		
Barn Swallow	1	1		8	3			3	3	2	3	24
Cliff Swallow											13	13
Tree Swallow											56	56
Bank Swallow											127	127
Junco		3										3
Song Sparrow		1					1(a)	1				3
Spotted Sandpiper		4						2				6
Savannah Sparrow		1				1		4(b)	5			11
Robin									1(a)			1
											Total	244

(a) Also contained one egg.

(b) Three of these four nests also contained one egg each.

MARINE INVERTEBRATES AT KENT ISLAND

Edward Stevens, Jr., Bowdoin '39
assisted by Newell Gillett, Bowdoin '40

There are many places along the North Atlantic shore line where marine life exists in abundance. This field of work has much to offer to the student of Biology.

My work was done around Kent Island, the site of the Bowdoin Kent Island Scientific Station. In my opinion there are few better places for marine invertebrates. A twenty-four foot change in tide provides a large area for collecting but one can secure much material by searching among the rocks, the mud flats and among the weeds massed along the shores.

In addition to the work close to shore I collected with the assistance of Lester Tate, who constructed a scallop drag, additional material in the deeper waters about the island. The drag was pulled behind the Station boat The Scientist with about twelve fathoms of line.

We also collected in the vicinity of the Lubec wharves where we were able to secure shrimp, barnacles, starfish, sea urchins and other forms not secured elsewhere.

Although this preliminary report is necessarily brief, the specimens we secured form a basis for future work at the station. We are intensely interested in the work and hope that it will be continued.

By calorimetric analysis each day I determined that the acidity of the water remained constant with a pH of 7.5 at low and high water. There was a change to 7.6 at mid-tide which I am unable to explain.

Following is a list of the invertebrates collected. I am indebted to Dr. H. Clark of the Museum of Comparative Zoology, Cambridge, Massachusetts for verification of my identifications, and to Miss Olga Hartmann of the University of Southern California for her help with the chaetopods.

Porifera Sponges
- Chalina oculata
- Halichondria panicea

Coelenterata Actinozoa Sea Anemones
- Metridium dianthus

Platyhelminthes Nemertea Sea Worms

Annelida Chaetopoda Sea Worms
- Thelepus cincinnatus
- Nereis pelagica
- Amphitrite cristata
- Harmothae imbricata -- a small sea bug
- Epidonatus squarulus

Annelida Oligochaeta Small sea worms

Arthropoda Crustacea
- Porcellis scaber Land Isopod
- Balanus balaniades Barnacle
- Cancer borealis Crab
- Pagurus policaris Crab
- Gamonaris salso Shrimp
- Meganyctiphanes norvegica Shrimp

Molusca Amphineura
- Chiton albue mantague Chiton

Mollusca Gastropoda Snails
- Buccinum undatum
- Buccinum sps
- Nassarius trinttatus
- Littorina obtusata
- Littorina littorea
- Margarites helicina
- Thais lapillus
- Acmaea testitudinalis Limpet

Mollusca Pelecepoda
- Callacardia convexa
- Mya arenaria Clam
- Modiolus modiolus Mussel
- Pectin islandicus Mussel
- Mytilus edulis Mussel
- Lepos anatifera Truncated clam

Echinodermata Holothurians
- Cucumaria frondosa

Echinodermata Asteroidea
- Asterias vulgaris Starfish
- Leptasterias tenera Starfish

Echinodermata Echinoidea Sea Urchins
- Strongylocentratidae drabachiensis

Chordata Tunicata
- Solitary samples of Boas
- Baltenia ovifera

COMMUNICATIONS

(by: Thomas A. Gross-W1JZM)

As on previous expeditions the short wave transmitter was licensed for unlimited amateur operation under the call VE1IN.

The station is equipped with modern apparatus and operated at the power output of ½ kilowatt in accordance to the legal power limit imposed upon our license. Power was supplied by a gasolene engine driven AC generator set.

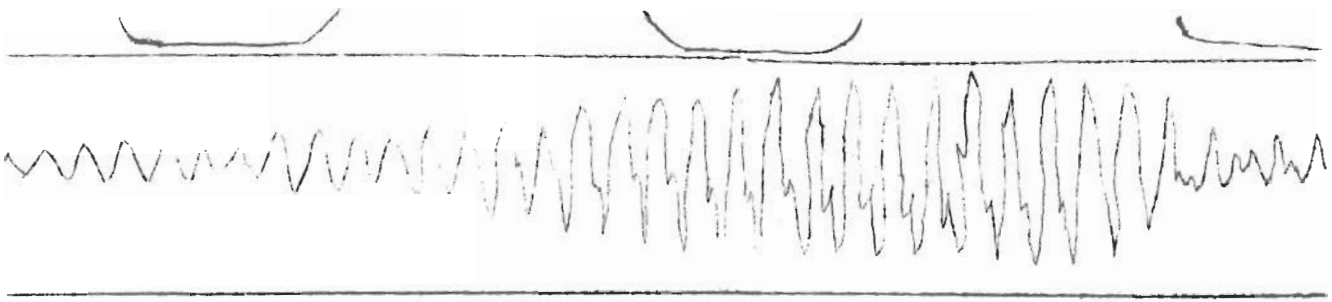
Greater emphasis was placed upon the transmission of daily weather reports and special programs for NBC's networks. The former were sent to Mr. Washington observatory via Amateur Radio and was then transmitted as part of the Yankee Network Weather Service. NBC programs were sent to RCA Communications at Riverhead, Long Island on a special assigned frequency of 4.8 megacycles. The weather report transmissions are being sent over the Yankee Network during the winter season by Ernest Joy, the warden, who has been equipped with a small 10 watt phone transmitter.

Operating activities have been confined to 3.885 and 4.8 megacycles. It has never been necessary for the operators to use other frequencies as the high power together with an excellent location for transmitting resulted in a tremendous signal. Indeed the phenominal signal strength, lead several government investigations to determine if the power was within the ½ kilowatt limit. Amateurs in Quebec reported the signal so powerful that it was impossible for them to work on adjacent channels. Even on these relatively low frequencies which are not satisfactory for long distance transmissions VE1IN has been heard regularly in many foreign countries as evidenced by letters of confirmation of short wave listeners as far away as New Zealand.

This would lead one to realize the technical success of station. However it is evident that the enormous signal is not only unnecessary but unfair. If VE1IN hopes to maintain its operating privileges it must either use lower power or directional antennae to prevent disturbances particularly in North-Western Canada where the signals are most powerful. Apparently a skip phenominon causes this as nearby stations in the Maritime Provinces are not bothered on channels somewhat removed from our carrier frequency. Kent Island offers an ideal location for a large terminated rhombic antenna and it is my hope that such an antenna will be erected.

A narrow beam could thus be directed toward New York and will hit most of the important cities on the way. Its effect would be nothing less than sensational. On most of the places on the Atlantic Seaboard the signal would be probably the most powerful short wave. However it is questionable whether a strong signal is necessary nor desirable. It has been our experience that a small transmitter such as now being used by the warden is quite adequate for all communications which must be handled. Evidently it is necessary to form some policy in regard to the operations of the radio division before any steps from the status-quo may be taken.

It was our policy last season to help the amateur stations, located on the nearby islands, by contributing equipment and advice as much as possible. It is felt that donating such equipment which is not absolutely necessary to the station's activities has done much to foster reliable communication so necessary to the inhabitants of these islands. It is helpful from our own standpoint particularly during the winter as our warden depends upon contacts with these amateurs.



Oscillogram of the Voice of a

KENT ISLAND HERRING GULL (Larus argentatus smithsonianus Coues)
Prepared by Charles S. Brand

In this tracing, the linear distance is such that one millimeter is equivalent in time to one five-thousandth of a second, and the entire seven inches shown represent only thirty-five thousandths of a second from a single note.

BIRD SONG RECORDING

(by: Paul Kellogg, Ph.D., Cornell University)

It is very pleasant to have a good excuse to sit down and recall the pleasant experiences we enjoyed at the Bowdoin-Kent Island Station last summer while studying the calls of Herring Gulls.

It was a few more than 600 miles from the Laboratory of Ornithology, at Cornell, to Eastport, Maine, where our equipment was put aboard the boat for the trip to Grand Manan Island -- the point nearest to Kent Island -- and from which we expected to pick up the bird calls from Kent Island by radio, from station VE1IN.

Our arrival at Grand Manan Island on August 27th was unheralded and our first act was to get in touch with Mr. Harley Richardson, in Castelia, who operates Radio Station VE1IE. Mr. Richardson was in almost constant touch with the Kent Island station and we had no difficulty in making arrangements over the radio-phone to commence work the following day.

Our original plans called for picking up the bird songs on Kent Island with a high-quality microphone and field amplifier placed as close to the birds as possible. The signals thus picked up were to be transferred by radio-phone to Grand Manan where they would be recorded on film.

In 1937 Mr. Albert Brand had, by this method, successfully recorded the songs of Leach's Petrels as they sang near their burrows in the little woods about the Hodgson House. This year we hoped to make further studies on the songs of these birds and, also, record the various calls of the Herring Gulls.

After some preliminary experiments, we decided to dismantle our sound truck and take the film recorder and other essential parts of the equipment to Kent Island. The fine amplifying equipment and power supplies of VE1IN were then used in place of our regular equipment and the excellent results justified the move.

The first good night for recording Petrel songs convinced us that the season was too far advanced for securing additional recordings of this bird, so we concentrated on the calls of the Herring Gull. This necessitated laying a two-wire line to the edge of the colony about a half-mile to the south. Here we located our parabolic concentrator and a small field amplifier close to a burlap blind in which our observer, Mr. Charles Brand (Bowdoin '40), could sit and watch the activities of the Gulls. With this set-up we had a fine opportunity to study the vocabulary of the Herring Gull. The loudspeaker in the radio building, fed by the powerful amplifier of VE1IN, enabled us to hear practically everything that was going on in the Gull colony, while Mr. Charles Brand, at the microphone, explained his interpretation of the various sounds we were hearing. In this manner, when everything was in readiness, we recorded about 2000 feet of Gull sound on standard 35 mm. film.

In order to check our results as recorded on the film, the well equipped dark room of the station enabled us to develop short test pieces of film and in this way secure the best possible results.

This film record of the Kent Island Gulls is now stored in the Laboratory of Ornithology film vault at Cornell University and is available for further study.

Preliminary work on the film, with the assistance of Mr. Charles Brand, indicates that most gull notes are of low frequency and that most of the energy of their calls is in the range between 500 and 2000 cycles per second; that is, in the second and third octaves above middle "C" on the piano keyboard.

In this report I am including a photographic enlargement of the sound track of a small portion of a single call; also a tracing of the track which gives the characteristic oscillogram recording of the sound wave.

The scale used for the above mentioned enlargements is such that a linear distance of one millimeter is equivalent to one five-thousandth of a second. With the recent improvements in the fidelity with which instantaneous recordings may be made on acetate discs, at low cost, it seems that it might be feasible to add a turntable and cutting-head to the equipment already on Kent Island. With the microphones, amplifiers and power supplies already available, such an addition would make possible further studies of the voices of many Kent Island birds.

In addition to recording bird song, I feel that there are many other possibilities for the study of birds on the Island. There is probably no better place on the North American continent to check, using American birds, on the experiments of Lorenze, Tinbergen and other European workers. Much of their work has been done with Gulls and, certainly, you have plenty of them on Kent Island. Such projects, in addition to being of scientific value, would be excellent training for the boys.

The possibility of radio broadcast experience, based on actual field work, at the station appeals to me as a real opportunity for the boys to learn to express themselves in an interesting way about the things they are doing.

In closing, I wish to thank you, your staff at the Island and the Directors of the station for making our week there so pleasant and profitable.

METEOROLOGY

(by: Robert M. Cunningham, Massachusetts Institute of Technology)

The weather records taken on Kent Island in the year 1938 were the most complete yet obtained. Mr. Joy has faithfully taken an almost unbroken record of the weather through the winter, spring, and fall of this year. More observations were taken this summer than in any previous summer. Observations during the summer were taken at 8:30 a.m., at 2 p.m., and at 8:30 p.m. They were also taken at 9 a.m. and 4 p.m. to coincide with the winter observations. Detailed records of the cloud types were made at the principal observation times. The fog precipitator that was made during the summer of 1937 was in operation all this summer. The records obtained, however, are of value only in a relative sense, for the instrument cannot be said to give accurately the water content of fog. Under the guidance of Mr. Houghton of M. I. T. it is hoped that a more precise instrument will be built for us this spring. Briefly, it is an instrument consisting of seven screens instead of the one which we had last summer. Through these screens a measured amount of fog is drawn by a large fan. This instrument will measure the water content with a margin of error of not more than 10%. Fog water will also be obtained for chemical analysis. The instrument used last summer was found to be not accurate enough for such observations. An anemometer and a windvane built by Mr. Stewart of Arlington were installed fifteen feet above the Administration Building. An electrical counter was used to give a continuous record of wind velocity. The instruments themselves performed well. The recorder, however, caused some trouble. An improved recorder will be necessary next summer, since the one in use failed in the November storms. The instrument shelters were set up on separate sets of legs four feet above low grass on September 16.

The observations taken on Kent Island are not being used solely for climatological studies. They are now becoming useful also in forecasting weather for the Gulf of Maine. Beginning last July we have been sending to the Yankee Network Weather Service observations from the Island. These reports are being broadcast over the morning weather program of the Network. Mr. Joy has continued to send in these data over his small radio transmitter. Except for the month of December, when the electric generator gave out, he has succeeded in getting the report through all winter.

OBSERVATIONS

The highest temperature of the summer was 75°, while Eastport, Maine; Yarmouth, Nova Scotia; Nantucket; and Boston had maxima respectively of 85°, 81°, 86°, and 94°. The number of days with a maximum temperature of 70° or over during June, July, and August was 8, whereas Eastport, Nantucket, and Boston had 33, 71, and 80 days, respectively. There were 21 such days at the Island in 1937. The most unusual phenomenon last summer was the excessive fog that prevailed during July. There was fog on the Island for some part of every day in the month of July except the first, seventh, eighth, and ninth. Dense to moderate fog continuously enveloped the Island from 9 p.m. on the seventeenth to 11 a.m. on the twenty-eighth except for a short time on the nineteenth and the

twenty-fourth when the fog burned off on parts of the Island but remained on the ocean. The effect of the fog on the maximum temperatures in July was striking. On only six days did the temperature reach 65 or above. On the whole, the summer was one of the foggiest (if not the foggiest) in the long records of the lighthouses adjacent to the Island. There were no moderate or heavy thunderstorms passing over the Island last summer. Distant thunder or lightning was recorded once in June, three times in July, and four times in August. The first frost occurred on September 3 with a heavy deposit of hoar frost in the low protected places on the Island. The minimum temperature in the shelter that night did not go below 46. The only effect of the September hurricane felt on the Island was a very heavy swell that rolled in on the morning of the twenty-second.

SUMMARIES FOR THE YEAR 1938

The mean temperature for the year was 42.7. The mean maximum was 49.0, and the mean minimum 36.5. The lowest temperature was 0 in January; the highest 75 in August. The total precipitation was 50.40 inches. There were 96 days on which fog or dense vapor fog appeared at one or more of the observation times. Clear weather or scattered clouds occurred on 39.4% of the observations. Cloudy or overcast weather occurred on 39.8% of the observations; and on 20.8% of the observations there was either fog or vapor fog.

NOTES ON DATA

Certain signs and abbreviations may need explanation. Wind velocities are given in the Beaufort scale. Sky and visibility abbreviations are according to international usage with the addition of "V" for vapor fog. Observations were taken at 9 a.m. and 4 p.m. from January 1 to June 14, and from September 19 to December 31. From June 15 through September 18 they were also taken at 8:30 a.m., 2 p.m., and 8:30 p.m. These times are all Atlantic Standard (60th meridian.)

MONTHLY METEOROLOGICAL SUMMARY FOR KENT ISLAND N. B. CANADA
Month of January, 1939

Date		Temperature °F				Humidity %		Precip. in.	Wind Beaufort		Sky		Vis. 0-9	
		Max.	Min.	Mean	Range	9 A.M.	4 P.M.	4 P.M. Prev.	9 A.M.	4 P.M.	9 A.M.	4 P.M.	9 A.M.	4 P.M.
S	1	24	7	15	17	69	87	.0	E 4	E 5	SV-o		3-8	
S	2	42	23	28	29	81	81	.39	SE7	NW5	r-c		7-7	
M	3	41	23	27	8	81	78	0	NW4	NW4	c-bc		8-8	
T	4	38	24	31	14	82	83	0	SW4	SW3	c-c		9-8	
W	5	39	31	35	8	90	83	0	NW4	SW5	bc-o		9-8	
T	6	38	23	31	15	77	79	0	4	E 2	b-b		9-9	
F	7	40	38	39	2	85	86	1.29	SE7	SE8	r--		6-7	
S	8	46	34	40	12	91	93	.08	N 3	N 3	c-c		8-8	
S	9	35	23	29	12	87	59	0	NW6	NW6	b-bc		9-9	
M	10	24	16	20	8	70	69	0	NW6	NW5	c-bc		8-8	
T	11	19	6	13	13	53	84	0	N 5	N 3	bcv-b		5-9	
W	12	21	11	16	10	82	71	0	NE3	NW2	ov-bc		2-7	
T	13	29	15	22	14	76	76	0	NE4	NE6	o-o		8-7	
F	14	30	18	24	12	74	89	0	N 5	NW3	bc-c		9-8	
S	15	29	15	22	14	100	66	0	NE6	NE6	c-bc		8-9	
S	16	23	9	16	14	79	86	0	N 5	NW4	bv-bc		5-9	
M	17	26	11	15	15	59	68	0	N 3	NE5	cv-c		8-8	
T	18	11	0	6	11	68	78	0	N 3	N 5	bcv-bc		4-7	
W	19	25	6	15	19	79	74	0	N 5	NW4	b-b		8-9	
T	20	35	18	27	17	85	89	0	NE3	W 2	c-bc		9-9	
F	21	33	24	28	9	87	89	0	NW5	NW5	b-bc		8-8	
S	22	30	32	25	28	78	89	0	E 3	E 2	o-o		9-9	
S	23	35	26	31	9	67	89	0	SE5	E 2	bc-bc		8-9	
M	24	38	27	32	11	82	83	0	SW5	S 6	c-o		8-9	
T	25	48	34	41	14	77	93	.02	SE7	SE8	o-r		7-6	
W	26	47	37	42	10	92	83	.41	W 6	W 6	o-c		7-8	
T	27	39	34	46	5	89	88	0	W 7	NW6	sq-bc		7-8	
F	28	22	10	16	12	61	85	0	N 4	N 3	cv-b		7-9	
S	29	28	12	20	16	58	88	0	N 4	SW5	bc-b		9-8	
S	30	39	21	30	18	77	75	0	SE5	SE7	o-o		8-7	
M	31	46	37	42	9	95	92	.21	W 7	NW6	o-r		7-6	
Mean		33.0	20.6	26.8		79	82	(Total) 2.40	4.9	4.6				

Highest Temperature 48.0 on the 25th
Lowest 0.0 on the 18th

Prevailing wind North. Percent of obs. Clear 39% Cloudy 50% Foggy 11%

Month of February

T	1	24	13	18	11	82	100	.15	N 6	NW5	b-bc	8-9	
W	2	18	7	13	11	79	50	0	N 4	N 2	c-bc	9-9	
T	3	38	13	25	25	85	88	0	SE5	SE7	c-o	9-7	
F	4	41	28	35	13	100	75	.63	S 8	NW4	f-c	3-8	
S	5	39	19	29	20	33	89	0	N 5	E 2	b-b	9-9	
S	6	40	25	33	15	92	85	.34	S 4	S 6	m-fr	4-2	
M	7	41	33	37	8	92	91	1.03	S 5	N 7	fr-c	3-8	

Month of February

Date	Temperature °F				Humidity %		Precip. in.	Wind Beaufort		Sky	Vis. 0-9	
	Max.	Min.	Mean	Range	9 A.M.	4 P.M.	4PM-4PM.	9 A.M.	4 P.M.	9 A.M. 4 P.M.	9 A.M.	4 P.M.
T 8	27	11	19	16	100	83	.04	N 7	N 4	bc-b	8-9	
W 9	39	20	30	19	83	83	0	W 5	W 4	c-c	8-8	
T 10	37	24	30	13	88	87	.12	NE5	N 6	s--	3-8	
F 11	14	2	8	12	73	82	0	N 7	NW7	cv-b	3-8	
S 12	26	6	16	20	81	82	0	N 5	SW4	bc-bc	9-9	
S 13	37	22	30	15	60	91	0	NW5	NE3	c-c	8-8	
M 14	28	24	26	4	77	87	0	E 6	E 7	s-o	4-4	
T 15	25	9	17	16	79	82	0	N 5	N 4	c-bc	8-9	
W 16	15	2	9	13	76	82	0	N 4	N 4	bcv-bc	5-8	
T 17	21	8	14	13	79	86	0	N 4	NW2	bv-bc	8-9	
F 18	32	15	24	17	100	89	.04	SE7	S 7	o-m	7-7	
S 19	36	27	31	9	89	88	.22	NE3	NE5	s-c	3-8	
S 20	29	23	26	6	87	77	0	NE7	NE7	c-c	8-8	
M 21	36	11	24	25	83	76	0	NW7	N 5	bc-b	8-8	
T 22	35	18	26	17	87	56	0	N 3	SW2	b-b	9-9	
W 23	32	28	30	4	89	90	.02	S 4	S 5	s-m	3-6	
T 24	33	31	32	2	100	90	.09	E 5	E 5	m-o	7-7	
F 25	33	24	28	9	88	88	.01	NE6	NE5	s-o	6-7	
S 26	36	16	26	20	70	89	0	N 4	E 1	bc-bc	9-9	
S 27	36	23	30	13	69	83	0	S 6	S 5	o-bc	7-8	
M 28	36	31	33	5	90	90(1"snow)	.14 (Total)	E 5	NE3	s-o	3-7	
Mean	31.5	18.3	24.9		83	83	2.83	5.2	4.6			

Highest Temperature 41 on the 4 & 7th
Lowest 2 on the 11 & 16th

Prevailing wind North.
Percent of obs. Clear 35%
Cloudy 54% Foggy 11%

Month of March

T 1	25	6	16	19	55	85	0	N 8	N 8	bc-c	9-9
W 2	27	16	20	9	84	88	0	NE4	NE3	s-o	8-8
T 3	10	8	9	2	78	29	0	NW7	N 7	c-b	8-8
F 4	23	3	13	20	59	86	0	N 5	NE2	bc-b	8-9
S 5	31	17	24	14	88	89	.04	SW6	S 7	s-r	6-6
S 6	38	29	34	9	95	90	.73	NW5	NW5	c-bc	8-8
M 7	32	19	25	13	58	89	0	NW7	W 5	b-bc	8-9
T 8	35	26	31	9	89	100	0	N 3	NW3	bc-bc	9-9
W 9	28	11	19	17	26	77	0	NW4	NW4	b-c	9-9
T 10	30	18	24	12	70	89	0	NW7	NW3	c-bc	8-9
F 11	30	21	26	9	88	89	0	E 4	SW2	b-bc	9-9
S 12	43	24	33	19	82	75	0	S 7	S 7	b-co	8-7
S 13	37	30	34	7	87	100	.04	S 8	S 8	o-r	8-6
M 14	38	29	33	9	78	49	.15	N 5	N 3	b-bc	8-9
T 15	34	13	24	21	70	90	0	N 3	N 3	b-b	9-9
W 16	40	26	33	14	57	83	0	E 2	SW5	b-o	9-8
T 17	36	30	33	6	79	81	0	SE7	NE8	c-c	8-8

Month of March

Date	Temperature °F Max.	Min.	Mean	Range	Humidity % 9 A.M.	4 P.M.	Precip. in. 4P.M.-4P.M.	Wind Beaufort 9 A.M.	4 P.M.	Sky 9 A.M. 4 P.M.	Vis. 0-9 9 A.M. 4 P.M.
F 18	35	30	32	5	90	90	.34	NE7	NE6	r-m	7-5
S 19	39	30	35	9	100	83	.22	NE5	N 3	m-c	6-8
S 20	43	33	38	10	83	84	0	SW3	SW2	bc-o	8-7
M 21	53	34	43	19	92	80	.07	W 4	NW6	f-bc	4-8
T 22	51	37	44	14	77	86	0	N 4	SE2	b-b	9-9
W 23	49	34	42	15	83	92	0	S 5	S 7	c-o	8-7
T 24	44	37	40	7	93	92	.02	SW7	SW7	f-f	2-2
F 25	50	31	41	19	74	93	0	NE5	E 2	bc-b	9-9
S 26	47	31	39	16	83	92	0	SE3	SW4	b-o	9-8
S 27	39	28	32	9	90	78	(2"snow).21	NE7	NE5	s-m	3-7
M 28	38	26	32	12	79	91	0	N 5	N 3	bc-c	9-9
T 29	57	30	44	27	91	86	.06	SE3	E 2	s--	2-9
W 30	58	28	43	30	82	75	0	E 3	SW3	c-bc	9-9
T 31	39	32	35	7	91	83	0	S 6	S 7	c-o	8-8
							(Total)				
Mean	38.0	24.8	31.4		79	84	1.88	5.1	4.6		

Highest Temperature 57.8 on the 30th Prevailing wind North. Per-
Lowest 3 on the 4th cent of obs. Clear 46%
Cloudy 49% Foggy 5%

Month of April

F 1	43	37	40	6	92	92	.49	W 7	W 7	f-f	3-2
S 2	43	33	38	10	84	84	0	NW5	SW3	b-c	9-9
S 3	41	32	37	9	81	92	0	NW3	NW3	s-bc	7-7
M 4	47	30	38	17	72	75	0	N 5	SW6	b-bc	9-9
T 5	42	31	37	11	83	82	.18	N 5	NW7	bc-sq	9-3
W 6	44	25	34	19	78	54	0	N 7	NW3	b-bc	9-9
T 7	43	27	35	16	54	62	0	N 2	SW2	b-b	9-9
F 8	43	29	36	14	83	67	0	NE4	SE3	b-c	9-9
S 9	41	30	36	11	82	92	1.21	SE7	S 6	r-rf	5-2
S 10	41	28	34	13	89	72	.34	NW6	NW7	c-c	8-8
M 11	36	17	27	19	51	64	0	N 4	SW7	b-bc	9-8
T 12	46	35	40	11	84	93	0	SW7	W 4	z-z	7-7
W 13	45	35	40	10	83	92	.08	E 5	E 3	c-z	7-7
T 14	44	36	40	8	92	92	.09	SW3	S 2	f-f	5-2
F 15	49	36	43	13	100	93	.14	SE	E 2	f-m	1-7
S 16	50	35	42	15	100	56	.03	E 5	W 2	b-b	9-9
S 17	46	32	39	14	93	92	0	SW5	SW5	bc-c	9-8
M 18	44	36	40	8	92	100	.11	S 7	SW8	r-d	5-6
T 19	46	39	43	7	92	93	1.32	S 7	SW3	f-f	1-1
W 20	52	37	44	15	100	87	.04	S 7	SW7	bc-c	8-8
T 21	65	38	52	27	94	86	.02	N 2	NE4	c-bc	8-7
F 22	52	34	43	18	91	92	.08	NE7	E 3	o-fr	7-3
S 23	42	36	39	6	85	--	0	N 3	---	bc--	9--
S 24	--	--	--	--	--	--	-	---	---	- -	- -
M 25	56	36	46	20	92	92	.14	NE4	NE5	d-o	7-8

Month of April

Date	Temperature °F				Hymidity %		Precip. in.	Wind Beaufort		Sky	Vis. 0-9
	Max.	Min.	Mean	Range	9 A.M.	4 P.M.	4PM.-4PM.	9 A.M.	4 P.M.	9 A.M. 4 P.M.	9 A.M. 4 P.M.
T 26	55	38	46	17	93	87	0	NE4	SW3	bc-bc	9-9
W 27	50	35	43	15	93	86	0	S 2	W 6	c-bc	9-8
T 28	54	42	48	12	93	93	0	W 7	NE6	bc-c	7-7
F 29	47	37	42	10	92	92	.02	NE4	E 7	c-c	8-7
S 30	40	38	39	2	92	92	1.03 (Total)	E 6	E 3	f-f	5-4
Mean	46.4	33.6	40.0		87	84	5.32	4.7	4.2		

Highest Temperature 65 on the 21st
Lowest 17.4 on the 11th

Prevailing Wind Southwest.
Percent of obs. Clear 41%
Cloudy 41% Foggy 18%

Month of May

S 1	43	36	39	7	92	92	.05	W 3	W 3	o-f	7-5
M 2	46	36	41	10	100	86	0	W 5	NW5	b-ou	9-8
T 3	52	33	43	19	68	79	0	NW4	W 3	b-b	9-9
W 4	58	36	47	22	77	54	0	N 4	N 3	b-bc	9-9
T 5	63	34	48	29	86	86	0	N 3	NW6	b-b	9-9
F 6	58	38	48	20	93	78	0	NE5	NE5	bc-bc	9-9

Month of May

Date	Temperature °F				Humidity %		Precip. In.	Wind Beaufort		Sky	Vis. 0-9
	Max.	Min.	Mean	Range	9 A.M.	4 P.M.	4P.M.-4P.M.	9 A.M.	4 P.M.	9 A.M. 4 P.M.	9 A.M. 4P.M.
S 7	48	37	43	11	85	92	0	SW3	SW4	c-o	9-8
S 8	48	38	43	10	93	93	0	NE2	W 1	C-bc	9-9
M 9	53	37	45	16	86	93	0	W 3	SW6	b-b	9-9
T 10	50	40	45	10	93	93	.19	SW6	SE4	c-o	8-8
W 11	45	40	42	5	100	93	.21	S 3	SW2	f-f	1-1
T 12	49	39	44	10	92	93	.02	S 2	NE3	f-b	1-8
F 13	51	40	46	11	93	96	.58	W 6	SW5	c-z	8-7
S 14	51	37	44	14	93	94	.02	W 4	SW3	o-bc	7-8
S 15	51	38	44	14	92	93	.69	NE7	NE7	r-r	6-7
M 16	48	39	44	9	93	100	1.43	S 5	NW3	d-c	5-8
T 17	45	39	41	5	92	85	.02	N 5	N 5	c-d	8-7
W 18	54	36	45	18	100	79	0	N 6	N 2	b-b	9-9
T 19	51	38	45	13	74	86	0	W 4	W 5	bc-b	9-9
F 20	50	40	45	10	87	93	.04	SW3	S 3	bc-r	9-7
S 21	62	41	51	21	100	73	.72	SW5	N 5	f-bc	2-9
S 22	57	42	50	15	93	78	.03	SW3	SW2	d-b	8-9
M 23	55	33	44	22	93	81	0	S 5	SW3	b-bc	8-9
T 24	51	42	46	9	100	93	.03	S 3	S 7	f-f	2-2
W 25	61	41	51	20	86	87	.14	N 3	NW3	b-bc	8-9
T 26	55	39	47	16	70	81	0	W 2	SW3	bc-c	9-9
F 27	55	42	49	13	100	93	.26	W 3	SW2	r-f	4-2
S 28	55	42	48	13	93	76	.40	E 1	E 2	f-bc	1-8
S 29	59	42	51	17	80	64	0	NE3	E 3	b-bc	9-9
M 30	60	37	48	23	86	64	0	E 1	SE2	b-b	9-9
T 31	71	40	56	31	93	73	0	W 4	W 5	bc-b	9-9
							(Total)				
Mean	52.8	38.5	45.7		90	85	4.82	3.7	3.7		

Highest Temperature 71 on the 31st
Lowest 33 on the 3rd

Prevailing Wind Southwest.
Percent of Obs. Clear 53%
Cloudy 32% Foggy 15%

Month of June

W 1	59	42	51	17	93	75	0	W 5	W 5	c-bc	8-8
T 2	54	43	48	11	80	93	0	W 5	SW6	c-o	8-8
F 3	57	45	51	12	82	93	.02	W 6	S 6	bc-r	8-5
S 4	59	41	50	18	93	82	.20	W 5	W 2	f-bc	5-8
S 5	59	44	52	15	93	94	1.03	S 4	SW2	rf-f	3-1
M 6	59	42	50	17	87	70	.16	N 4	NW4	c-bc	9-9
T 7	59	42	51	17	86	88	0	S 2	SW4	bc-f	9-2
W 8	52	45	48	7	94	93	.27	SW6	SW6	f-r	2-2
T 9	58	44	51	14	93	87	.87	W 2	W 4	f-bc	1-8
F 10	61	44	53	17	71	67	0	N 3	W 2	bc-b	9-9
S 11	54	43	48	11	82	87	0	SW3	S 5	c-o	8-8
S 12	55	46	51	9	93	88	1.07	SW5	SW3	rf-f	1-1
M 13	58	44	51	14	94	82	.09	NE5	NE5	r-c	8-9

Month of June

Date	Temperature °F Max.	Min.	Mean	Range	Humidity % 8:30 A.M.	2 P.M.	8:30 P.M.	Precip. in. 8:30 P.M. to 8:30 P.M.	Wind Beaufort 8:30 A.M.	2 P.M.	8:30 P.M.	Sky 8:30 A.M.	2 P.M.	8:30 P.M.	Vis. 0-9 8:30 A.M.	2 P.M.	8:30 P.M.
T 14	72	45	58	27	82	47	61	0	E 1	NE2	NE2	c	bc	bc	9	9	9
W 15	59	42	51	17	82	82	100	0	E 3	NE3	SW2	bc	bc	f	8	8	4
T 16	60	41	50	19	93	77	94	0	NE3	NE2	E 2	o	c	r	7	9	8
F 17	58	47	53	11	100	97	100	.79	SW2	SW3	SW3	rf	f	rf	3	1	2
S 18	59	45	52	14	97	97	93	.12	W 2	W 2	W 2	f	f	f	6	2	4
S 19	58	46	52	12	100	100	87	.40	E 2	NE3	NE4	f	rt	c	1	7	8
M 20	65	48	56	17	81	88	93	.04	NE2	W 3	W 4	bc	bc	cz	8	8	7
T 21	65	46	56	19	83	79	90	0	W 2	W 3	SW1	c	bc	bc	8	8	8
W 22	59	47	53	12	85	83	100	0	SW3	SW4	SW2	bc	bc	f	6	6	1
T 23	57	48	52	9	100	100	100	0	SW2	SW3	SW2	f	f	f	1	1	1
F 24	62	48	55	14	100	89	100	0	W 2	S 2	SW2	f	f	f	1	4	1
S 25	54	46	50	8	100	94	100	0	SE1	S 3	W 2	f	f	f	1	2	1
S 26	62	48	55	14	100	94	93	.12	SW3	N 3	W 2	mf	o	o	3	8	7
M 27	58	47	53	11	97	91	97	.36	N 2	N 1	NE1	r	o	o	7	8	7
T 28	56	48	52	8	100	88	100	.33	NE3	NE3	NE2	rf	o	r	5	8	7
W 29	60	47	53	13	87	83	96	.94	NE3	E 1	W 1	o	c	o	8	8	9
T 30	63	46	54	17	59	72	80	0	NW2	SW3	W 2	bc	bc	c	9	9	9
								(Total)									
Mean	59.0	45.0	52.0		90	85	94	6.81	3.0	3.3	2.1						

Highest Temperature 71.6 on the 14th
Lowest 41 on the 4th & 16th

Prevailing Wind Southwest.
Percent of Obs. Clear 31%
Cloudy 34% Foggy 35%

Month of July

F 1	61	45	53	16	76	76	90	0	SW3	S 3	S 2	c	c	o	9	9	9
S 2	50	46	48	4	96	100	100	.71	SE3	SE6	SE2	r	rf	f	7	4	3
S 3	59	46	52	13	94	100	96	.03	NE1	W 3	NW2	f	f	bc	4	1	8
M 4	62	46	54	16	88	84	94	0	N 2	SW2	NW1	c	bc	c	7	7	8
T 5	59	47	53	12	88	87	94	.04	NW2	W 4	W 2	c	c	c	8	8	8
W 6	65	47	51	8	88	89	82	.05	W 1	SW3	NW1	bc	bc	c	5	7	8
T 7	69	49	59	20	71	84	94	0	NW2	SW3	W 3	bc	bc	bc	9	8	8
F 8	64	46	50	8	88	79	94	0	S 2	S 3	S 3	bc	c	c	7	6	7
S 9	62	51	56	11	83	79	94	0	S 3	S 4	SW4	bc	bcz	bc	6	4	7
S 10	58	49	54	9	97	94	100	0	SW3	S 3	SW2	f	f	f	4	2	1
M 11	66	45	56	21	75	78	94	0	N 3	E 3	E 3	bc	bc	bc	8	8	8
T 12	54	49	52	5	100	100	100	.77	E 2	N 2	NE2	o	f	f	7	6	2
W 13	64	49	56	15	100	89	100	.13	NE2	SE1	W 2	f	o	f	1	6	1
T 14	59	48	54	11	94	94	100	0	S 3	S 2	S 3	f	f	f	4	1	1
F 15	58	50	54	8	100	97	100	.04	SW3	SW4	SW4	f	f	f	1	2	1
S 16	63	47	55	16	88	79	100	0	W 2	SW3	SW3	bc	bc	f	7	7	1
S 17	64	48	56	16	94	79	97	0	S 2	SW4	SW2	bc	c	c	6	6	6
M 18	62	50	56	12	100	94	100	.55	SW2	NW2	SE2	df	fr	fr	1	2	1
T 19	67	48	57	18	100	90	100	.31	N 2	N 1	N 1	f	f	f	2	4	1

Month of July

Date	Temperature °F Max.	Min.	Mean	Range	Humidity % 8:30 A.M.	2 P.M.	8:30 P.M.	Precip. in. 8:30 P.M.-8:30 P.M.	Wind Beaufort 8:30 A.M.	2 P.M.	8:30 P.M.	Sky 8:30 A.M.	2 P.M.	8:30 P.M.	Vis. 0-9 8:30 A.M.	2 P.M.	8:30 P.M.
W 20	61	49	55	12	100	100	100	.86	S 1	SW2	SW2	f	f	f	1	2	1
T 21	63	49	56	14	100	94	100	.12	W 2	S 2	SW2	f	f	f	1	3	1
F 22	60	49	54	11	100	97	100	1.74	SW2	S 2	S 3	f	f	f	2	2	1
S 23	63	50	57	13	100	97	100	.33	S 2	SW4	S 4	f	f	f	2	2	1
S 24	60	54	57	6	100	97	100	.10	SW4	SW3	SW2	f	f	f	2	6	2
M 25	61	51	56	10	100	89	100	.06	S 3	S 3	S 3	f	f	f	2	2	1
T 26	61	51	56	10	100	97	100	0	W 3	S 2	SW3	f	f	f	2	2	1
W 27	61	50	55	11	100	89	100	0	SW3	SW2	S 3	f	f	f	1	3	1
T 28	66	50	58	16	100	79	97	0	NE3	NE3	SW3	f	c	f	2	8	4
F 29	58	50	54	8	100	100	100	.29	SE3	SE4	S 4	f	f	f	2	2	2
S 30	62	50	56	12	100	94	100	.01	SE2	SW2	SW2	f	f	f	1	2	4
S 31	66	49	58	17	94	84	94	0	W 3	SW3	W 3	b	bc	bc	6	7	7
								(Total)									
Mean	61.6	48.7	55.1		94	87	97	6.12	2.4	2.8	2.5						

Highest Temperature 69.2 on the 7th
Lowest 46.0 on the list

Prevailing Wind Southwest.
Percent of Obs. Clear 19%
Cloudy 24% Foggy 57%

Month of August

M 1	64	49	57	15	89	89	100	0	S 2	SW3	S 4	c	lf	f	5	4	1
T 2	64	52	58	12	100	84	89	.02	W 3	SW3	S 3	f	bc	r	3	8	8
W 3	67	49	58	18	94	85	94	0	W 2	SW2	W 2	f	bc	o	3	7	7
T 4	75	52	63	23	94	85	100	.22	SW2	S 4	S 3	f	f	f	5	5	1
F 5	62	52	57	10	100	97	100	0	SW3	SW3	S 2	f	f	f	1	3	1
S 6	73	49	61	24	80	77	94	0	E 1	SE2	S 2	bc	c	c	8	7	4
S 7	62	53	58	9	100	94	88	0	SW3	SW3	W 2	f	f	bc	1	3	7
M 8	73	58	63	20	80	64	57	0	N 3	N 2	N 2	c	c	bc	8	9	9
T 9	68	52	60	16	78	85	100	.10	NE2	E 1	N 1	bc	bc	f	8	9	2
W 10	70	53	61	17	84	71	94	.02	N 5	N 3	N 2	c	c	bc	8	9	8
T 11	59	50	55	9	94	88	94	.01	E 2	S 3	NE3	c	o	o	7	8	7
F 12	62	52	57	10	89	89	94	.03	NW1	SW2	W 3	f	f	c	4	5	8
S 13	68	52	60	16	79	71	88	0	NW3	SW3	W 2	bc	bc	bc	8	9	8
S 14	66	50	58	16	88	80	88	0	SW2	SW4	SW3	cz	cz	cz	7	7	8
M 15	61	52	56	9	89	94	97	.06	S 2	SW3	S 4	f	f	f	1	4	4
T 16	66	51	59	15	84	90	100	0	S 3	S 3	S 3	f	f	f	5	4	1
W 17	65	52	58	13	89	84	100	0	S 4	S 4	S 3	bcz	bcz	f	7	7	2
T 18	68	51	60	17	94	81	97	0	SE4	S 3	SE3	f	bc	bc	2	4	8
F 19	66	52	59	14	100	80	94	0	SW1	W 2	W 3	f	f	b	3	3	7
S 20	67	51	59	16	89	80	94	0	W 2	SW2	W 2	bc	bc	bcz	9	8	8
S 21	69	53	61	16	79	67	100	0	NE2	S 4	S 4	bc	bcz	f	8	8	2
M 22	70	53	61	17	100	94	100	.06	S 2	S 3	W 1	f	f	f	3	4	1
T 23	65	50	58	15	94	82	89	.02	SW2	SW3	N 2	bc	bc	c	7	8	8
W 24	65	53	59	12	94	94	97	.89	N 3	SE4	NE3	c	r	o	7	5	8
T 25	62	54	58	8	94	89	75	.68	N 4	N 5	N 4	r	c	c	8	8	8
F 26	72	49	60	23	64	82	87	0	NW2	W 2	W 2	bc	bc	bc	9	9	9
S 27	64	51	58	13	89	89	97	0	SW3	S 3	S 3	bc	f	bcz	8	2	6

Month of August

Date	Temperature °F Max.	Min.	Mean	Range	Humidity % 8:30 A.M.	2 P.M.	8:30 P.M.	Precip. in. 8:30 P.M. - 8:30 P.M.	Wind Beaufort 8:30 A.M.	2 P.M.	8:30 P.M.	Sky 8:30 A.M.	2 P.M.	8:30 P.M.	Vis. 0-9 8:30 A.M.	2 P.M.	8:30 P.M.
S 28	63	49	56	14	77	73	93	.04	NW4	SW5	W 2	bc	bc	b	9	9	9
M 29	63	46	54	17	79	80	94	0	SW2	SW3	S 3	bc	bc	bc	9	9	9
30	64	46	55	18	81	68	93	0	SE1	SE2	N 3	bc	c	bc	8	4	9
W 31	65	49	57	16	88	84	98	0	N 2	NE2	SW2	c	bc	f	8	8	4
								(Total)									
Mean	66.1	50.7	58.4		88	83	93	2.15	2.4	2.8							

Highest Temperature 75 on the 4th Prevailing Wind South. Percent of
Lowest 46 on the 30th Obs. Clear 38% Cloudy 28%
Foggy 34%

Month of September

T 1	59	50	55	9	100	97	.94	S 4	SW4	f	f	2	4
F 2	65	48	56	17	63	77	0	N 2	SW5	bc	bc	9	9
S 3	62	46	54	16	78	83	0	S 3	SW4	bc	bc	9	9
S 4	60	49	55	11	85	78	0	S 4	S 4	cz	bcz	8	7
M 5	60	50	55	10	70	72	0	W 4	NW4	bc	bc	8	8
T 6	57	45	51	12	66	76	0	W 3	SW4	bc	b	8	9
W 7	60	49	54	11	88	94	.50	SW4	SW4	oz	r	7	7
T 8	65	44	54	19	69	54	.23	N 4	N 4	bc	bc	8	9
F 9	64	43	53	21	78	82	0	N 4	NE3	c	bc	8	9
S 10	61	43	52	18	75	77	0	NW3	SW4	c	b	8	9
S 11	65	49	57	16	78	78	0	W 4	SW2	b	b	9	9
M 12	60	47	54	13	88	88	0	W 2	SW3	c	oz	8	7
T 13	57	50	53	7	94	100	.54	SE5	W 3	r	f	6	2
W 14	61	49	55	12	91	74	0	SW1	S 2	c	bc	7	8
T 15	60	49	55	11	100	94	.92	E 3	S 4	rf	o	5	3
F 16	69	52	60	17	100	89	.31	NW2	SW2	f	cz	5	8
S 17	59	46	53	13	76	82	0	NE3	NE1	bc	c	9	9
S 18	55	49	52	6	98	100	.53	NE4	NE3	fr	fm	4	3
M 19	60	52	56	8	94	94	.08	NE2	S 2	f	f	2	2
T 20	58	53	55	5	94	94	.06	S 5	SW5	f	f	2	3
W 21	64	53	59	11	100	95	0	S 5	S 6	f	z	2	7
T 22	--	53	--	--	88	--	.06	W 6	- -	---		7	--
F 23	--	--	--	--	--	--	-	- -	- -	---		---	---
S 24	--	--	--	--	--	--	-	- -	- -	---		---	---
S 25	60	--	--	--	87	58	0	N 4	N 4	b	bc	9	9
M 26	55	54	54	1	81	76	0	NW4	SW5	o	bc	9	9
T 27	60	50	55	10	88	91	0	SW4	SW5	bc	c	8	7
W 28	56	49	52	7	94	88	.40	N 4	SW4	b	b	8	9
T 29	62	49	56	13	94	64	0	W 4	N 3	f	bc	4	8
F 30	52	46	49	6	87	93	.06	E 5	NE6	c	--	8	6
							(Total)						
Mean	60.1	48.7	54.4		86	83	4.65	3.6	3.6				

Month of September

Date	Temperature °F				Humidity %		Precip. in.	Wind Beaufort		Sky		Vis. 0-9	
	Max.	Min.	Mean	Range	9 A.M.	4 P.M.	4P.M.-4PM.	9 A.M.	4 P.M.	9 A.M.	4 P.M.	9 A.M.	4 P.M.

Highest Temperature 69 on the 16th. Prevailing Wind Southwest.
Lowest 43 on the 9th. Percent of Obs. Clear 47%
Cloudy 30% Foggy 23%

Month of October

S	1	57	47	52	10	93	82	.85	N 5	SW4	bc-bc	8-8
S	2	57	41	49	16	100	60	.05	N 4	N 2	b-bc	8-9
M	3	55	45	50	10	87	63	0	NE4	NE4	bc-bc	9-9
T	4	55	46	50	9	87	84	0	E 5	E 4	bc-c	9-9
W	5	60	47	54	13	70	82	.02	NW4	SW5	b-bc	8-9
T	6	48	44	46	4	93	79	.07	NE6	NE5	r-c	7-8
F	7	48	38	43	10	71	60	0	N 4	NE4	bc-bc	9-9
S	8	52	42	47	10	80	73	0	SE4	NE4	bc-c	8-9
S	9	54	43	48	11	73	70	0	N 3	N 3	bc-b	9-9
M	10	57	46	52	11	74	65	0	N 5	NW4	c-bc	9-9
T	11	57	46	51	11	76	76	0	NW3	SW4	bc-c	9-8
W	12	60	49	55	11	88	88	.04	SW3	SW4	b-bc	9-8
T	13	59	50	54	9	94	88	0	S 4	SW5	f-f	6-6
F	14	58	51	55	7	100	94	.02	SW4	SW4	f-c	2-7
S	15	59	51	55	8	76	76	0	S 3	SW4	f-bc	1-6
S	16	56	48	52	8	87	82	0	E 3	SE1	f-f	1-4
M	17	58	47	52	11	75	82	.07	W 5	N 5	d-bc	7-8
T	18	54	43	49	11	72	81	0	N 4	SE1	bc-b	8-9
W	19	56	46	51	10	76	82	0	SW5	SW5	c-c	8-7
T	20	55	51	53	4	87	88	.21	W 4	W 2	d-f	4-4
F	21	55	46	50	9	79	51	.14	N 3	N 4	d-bc	7-9
S	22	55	42	49	13			0	N 4	N 3	bc-bc	8-9
S	23	49	38	43	11			0	O	O	bc-o	9-8
M	24	56	48	52	8			.15	S 6	SE7	o-r	8-5
T	25	58	44	51	14			1.41	NW6	NW6	c-bc	8-8
W	26	54	48	51	6			0	W 2	SW5	bc-bc	9-8
T	27	57	49	53	8			0	S 5	S 4	c-bc	7-7
F	28	55	47	51	8			0	E 5	E 5	c-bc	8-8
S	29	52	41	47	11			.04	E 6	NE5	f-o	5-7
S	30	50	46	48	4			.04	NE6	NE6	o-bc	8-8
M	31	49	40	45	9			0	NE6	NE5	o-c	8-8
								(Total)					
Mean		55.0	45.5	50.2		83	77	3.11	4.2	4.3			

Highest Temperature 60 on the 12th Prevailing Wind North. Percent
Lowest 38 on the 23rd of Obs. Clear 51% Cloudy 36%
Foggy 13%

Month of November

Date	Temperature °F Max.	Min.	Mean	Range	Humidity % 9 A.M.	4 P.M.	Precip. in. 4 P.M.-4 P.M.	Wind Beaufort 4 A.M.	4 P.M.	Sky 9 A.M.	4 P.M.	Vis. 0-9 9 A.M.	4 P.M.
F 1	45	38	41	7			0	NE4	W 2	bc	-b	9	-9
W 2	52	43	48	9			0	NE5	NE6	c	-bc	8	-9
T 3	49	30	39	19			0	N 2	SW4	bc	-b	9	-9
F 4	59	46	53	13			0	SW6	SW5	o	-z	7	-7
S 5	56	48	52	8			.05	W 4	W 4	c	-c	7	-8
S 6	54	50	52	4			0	SW4	SW4	z	-f	6	-1
M 7	52	44	48	8			.05	SW3	SW4	f	-f	1	-1
T 8	55	48	51	7			.03	W 6	SW6	c	-bc	8	-8
W 9	55	43	49	12			.17	N 4	N 4	c	-bc	7	-9
T 10	51	42	47	9			0	NW6	NW6	b	-b	8	-8
F 11	50	42	46	8			0	NE2	E 2	bc	-bc	8	-9
S 12	54	42	48	12			0	SW4	N 5	z	-b	6	-8
S 13	52	36	44	16			.06	SE5	S 6	c	-r	8	-7
M 14	54	42	48	12			.06	N 4	N 6	c	-c	8	-8
T 15	44	36	40	8			0	NW6	NW6	bc	-bc	8	-8
W 16	37	30	33	7			0	NW4	NW5	bc	-bc	8	-9
T 17	37	26	32	11			.17	S 4	S 7	c	-r	8	-5
F 18	51	40	45	11			1.60	0-0	S 3	b	-o	8	-7
S 19	55	45	50	10			.06	SW6	NE2	f	-p	4	-7
S 20	48	36	42	12			1.20	NE3	NE5	o	-c	8	-9
M 21	45	33	39	12			0	W 4	N 2	b	-bc	8	-9
T 22	52	36	44	16			0	SW5	SW4	c	-bc	8	-8
W 23	52	35	44	17			0	N 3	NE2	c	-bc	8	-8
T 24	38	29	33	9	(1"snow)		.17	NE4	NE5	o	-o	7	-7
F 25	32	21	27	11				NE9	NE9	s	-s	2	-0
S 26	24	16	20	8	(24" snow)		2.40	N 4	NE2	bc	-bc	8	-9
S 27	34	23	28	11				SE6	NE6	s	-s	3	-0
M 28	36	21	29	15	(2"snow)		.40	N 4	W 6	bc	-bc	9	-8
T 29	40	29	34	11			.02	N 3	SW6	c	-r	9	-7
W 30	44	35	40	9			.05	N 3	NE3	o	-u	7	-7
							(Total)						
Mean	46.9	36.2	41.6				6.49	4.2	4.5				

Highest Temperature 58.8 on the 4th
Lowest 16.4 on the 26th

Prevailing Wind Northeast.
Percent of Obs. Clear 47%
Cloudy 46% Foggy 7%

Month of December

Date	Temperature °F Max.	Min.	Mean	Range	Humidity %	Precip. in. 4PM.-4PM.	Wind Beaufort 9 A.M.	4 P.M.	Sky 9 A.M.	4 P.M.	Vis. 0-9 9 A.M.	4 P.M.
T 1	43	24	33	19		.04	NW6	NW6	bc-c		8-7	
F 2	24	13	19	11		0	NW6	N 6	bcv-bc		7-8	
S 3	32	18	25	14		0	N 2	SW4	bcv-bc		7-9	
S 4	49	32	40	17		.30	S 8	SW8	r-bc		5-7	
M 5	47	39	43	8		0	S 1	SE2	c-o		8-7	
T 6	54	41	48	13		.99	S 7	SW8	fr-fr		3-3	
W 7	53	43	48	10		.06	W 8	W 7	bc-bc		7-8	
T 8	48	39	43	9		0	SW1	W 2	bc-c		8-8	
F 9	47	42	45	5		.21	E 4	E 5	r-r		6-3	
S 10	49	42	45	7		1.17	E 4	S 4	f-r		3-7	
S 11	49	39	44	10		.06	NW6	NW6	bc-c		8-8	
M 12	42	37	40	5		.16	0-0	SW2	c-r		9-7	
T 13	42	30	36	12		0	NW6	NW4	bc-bc		9-9	
W 14	43	34	38	9		0	W 7	SW8	c-o		8-7	
T 15	33	18	26	15		0	NW6	NW6	bcv-bc		6-8	
F 16	23	13	18	10		0	N 4	N 4	bcv-b		7-9	
S 17	39	19	29	20		0	SE2	S 4	bc-c		9-8	
S 18	41	38	39	3		0	E 5	E 4	o-o		8-8	
M 19	40	34	37	6		.14	NE4	NE5	o-o		7-7	
T 20	36	30	33	6		0	NE6	NE6	o-o		7-7	
W 21	32	27	30	5		0	N 4	N 2	c-bc		9-9	
T 22	29	23	26	6		0	NE4	N 6	cv--		7-7	
F 23	28	17	22	11		0	N 6	N 4	bc-c		8-8	
S 24	30	22	26	8		0	E 2	SE4	c-sq		9-7	
S 25	34	30	32	4		0	E 4	SE4	c-s		8-7	
M 26	32	23	28	9	(2"snow)	.06	N 4	N 4	bc-b		8-9	
T 27	40	21	30	19		.18	SE6	SE9	o-r		7-5	
W 28	36	20	28	16		.24	N 7	NW7	c-bc		8-8	
T 29	21	6	14	15		0	N 5	N 5	bcv-o		7-8	
F 30	37	22	29	15	(1"snow)	.21	NW4	N 4	o-b		7-7	
S 31	26	8	17	18		0	N 4	S 2	bcv-s		8-3	
						(Total)						
Mean	38.0	27.2	32.6			3.82	4.6	4.8				

Highest Temperature 54 on the 6th Prevailing Wind North. Percent
Lowest 6.4 on the 29th of Obs. Clear 30 % Cloudy 54%
Foggy 16%

PUBLISHED CONTRIBUTIONS

1. Gross, William A. O. 1935. The Life History Cycle of Leach's Petrel (Oceanodroma leucorhoa leucorhoa) on the Outer Sea Islands of the Bay of Fundy. Auk, Vol. 52, No. 4, pp. 382-399. Illus. 4 plates, 11 fig. 8 tables.

1936. Kent's Island-Outpost of Science. Natural History, Vol. 37, No. 4, pp. 195-210. Illus. 22 photographs.

2. Gross, Thomas A. W1JZM, VE1IN
1937. Designing the First Stage of the Speech Amplifier. Q. S. T. Vol. 21, No. 12, pp. 33-100. Illus. 1 plate, 1 fig.

3. Gross, Alfred O. 1938. Eider Ducks of Kent Island. Auk, Vol. 55, No. 3, pp. 387-400. Illus. 3 plates, 6 fig.

4. Gross, Thomas A. W1JZM, VE1IN
1938. Operation of Zero-bias Modulators. Radio, Number 230, pp. 21-23. Illus. 7 fig.

5. Pettingill, Olin S., Jr.
1939. The Bird Life of the Grand Manan Archipelago. Proc. Nova Scotia Institute of Science. Vol. 19, Pt. 4, pp. 293-372. Illus. 3 plates, 3 fig.

STATION EQUIPMENT

The station is made up mainly of the following equipment:

1. Domitory and Mess Hall. 42' x 24' size. Two floors. Twenty beds. Mess table with seating capacity for thirty people. Cooking utensils, stove, refrigerator, food storage room, large sink. Laboratory with chemicals, collecting paraphernalia, balance scales. Meteorological observatory on roof.

2. Administration Building. 14' x 20' size. Used by caretaker for living quarters during the entire year. Room for the Director. Complete kitchen. Meteorological observatory. Radio transmitter and receiver.

3. Work Shop. 12' x 30' size. Carpentry and machine shop with complete set of tools. Photographic darkroom. Electric generating room with a 3 kilowatt General Electric generator driven by a four-cylinder gasoline motor, and a 2 kilowatt Kato generator. Wires carry electricity to the other buildings.

4. Radio Station. 9' x 12' size. 1000-watt output radiophone transmitter and receiving apparatus. General electrical equipment and supplies.

5. Guest House. 10' x 20' size. Four beds and mattresses. Two rooms.

6. Wharf House. Two stories. Second floor has five beds. Storage on first floor. Garage for Ford.

7. Boat House. Two stories. Six beds on second floor. Storage for boats on first floor.

8. Cow Barn. Space for cow and fodder. Present animals purchased last summer.

9. Marine Equipment. 150-foot wharf. 40-foot cruising boat, Cavalier II. Pung. Dinghy.

The development of the station's physical plant has been largely due to the kind contributions of the following business firms: Abercrombie and Fitch; Aluminum Company of America; American Brass Company; American Thermos Bottle Co.; American Microphone Co.; American Phemolic Corp.; American Transformer Co.; Inc.; Astatic Microphone Laboratories, Inc.; Beede Meter Works; Bell and Howell Co.; Boston Bostitch, Inc.; Burnham and Morrill Co.; H. C. Baxter Co.; Borden's Sales Co.; Bird & Son, Inc.; Briggs & Stratton Co.; Bassett Research Corp.; Belden Mfg. Corp.; Bell Telephone Laboratories; Bruno Laboratories; Brush Development Co.; Burgess Bottling Co.; Burton-Rogers Co.; Carborundum Co.; Carl Ziess, Inc.; Casein Company of America; Celotex Corp.; Coleman Lamp and Stove Co.; Collins Radio Co.; California Fruit Growers Exchange; Corn Products Sales Co.; Cornell-Dubilier

Electric Corp.; Cape Cod Cranberry Co.; Champion Spark Plug Co.; Chicago Flexible Shaft Co.; C & S Xtals; Dazey Churn and Mfg. Co.; E. Du Pont de Nemoeurs and Co.; Eitel-McCullough Ltd.; Electro-Voice Mfg. Co.; Electric Storage Battery Co.; Electronic Applications; Folmar Graflex Corp.; Ford Motor Co.; General Fireproofing Co.; General Food Sales Co.; Hamilton Watch Co.; Hallicrafters Co.; E. F. Hodgson Co.; Hawaiian Pineapple Co.; Heintz & Kaufman Ltd.; Hood Rubber Co.; F. M. Hoyt Co.; Ithaca Gun Co.; Hygrade Sylvania; Jensen Radio Mfg. Co.; Johnson Motors; Kato Co.; Kalamazoo Stove Co.; Kendall Refining Co.; Ken-Rad Tube and Lamp Corp.; Kenyon Transformer Co.Inc.; Lever Bros. Co.; Lenz Mfg. Co.; Libby, McNeill and Libby Co.; Marbles Arms and Mfg. Co.; P. R. Mallory Inc.; Mohowaka Rubber and Woolen Co.; B. F. Moore & Co.; National Enameling and Stamping Co.; National Biscuit Co.; Old Town Canoe Co.; Palmer Match Co.; Par-Metal Products Co.; Plymouth Cordage Co.; Phelps Dodge Mfg. Corp.; Phillips Packing Co.; Pyrene Mfg. Co; Quaker Oats Co.; Raytheron Production Corp.; R. J. Reynolds Tobacco Co.; Sears, Roebuck and Co., Servel Inc.; Standard Brands, Inc.; Standard Transformer Co.; Swift and Co.; Socony-Vacuum Oil Co.; Sparklets Corp.; Tobe Deutschman Corp.; Triplett Electrical Inst. Co.; Taylor Tubes Inc.; Studebaker Motor Co.; Topogranic Service Co.; Tung-Sol Lamp Works; Western Cartridge Co.; Western Clock Co.; Western Electric Co.; Winchester Repeating Arms Co.; Universal Motor Co.

Numerous contributors of former years not mentioned above are acknowledged in the previous Annual Reports.

CONCLUSION

It is with regret that I have come to the end of my direct association with the Kent Island Scientific Station. I am very grateful for the financial support and encouragement of Messrs. Sumner T. Pike, John S. Rockefeller, Henry S. Shaw, and Henry H. Pierce and for the efforts and comradeship of my colleagues in the field. I sincerely hope that the 1939 staff will continue the tradition that so many of us have worked hard to create.

In conclusion, I want to emphasize that although the purpose of Kent Island is scientific research, the main reason for its existence is that undergraduates want to go there for the experience it offers.

Respectfully submitted,

W. A. O. Gross
Director.