NORTHERN RESEARCH REPORTS

Medical Investigation at Southampton Island

During the summer months of 1948 the second Queen's University Arctic Expedition continued the study of the morbidity rates and nutritional status among the Eskimo population of Southampton Island, N.W.T., which was begun in 1947. A party of five under the direction of Dr. Malcolm Brown, Associate Professor of Medicine, Queen's University, remained on the island from late June to mid-September using an airstrip at Coral Harbour as their base of operations.

With the assistance of an excellent native interpreter, complete clinical assessment of over 200 Eskimos was possible, and the information so gained when taken with the information collected in 1947, is sufficient to permit certain general conclusions. Clinical evidence of ascorbic acid deficiency was seen in almost one-third of the population, and corroborative biochemical evidence was provided by assay of levels of ascorbic acid in both blood and plasma, and by saturation excretion experiments. Signs of riboflavin deficiency were also widespread[1,2]. The sources of vitamin C for the Eskimo are of some interest and a collection of 17 species of plants, which are eaten in part by the Eskimos during the spring and summer, was made and their ascorbic acid content identified.

The problem of respiratory tract diseases is an important one and radiographs were made of the chests of all natives examined, and serial specimens of sputa were collected from those complaining of cough. The sputa were dessicated with preservative to suspend bacterial activity and later reactivated in the Department of Bacteriology, Queen's University, for determination of the type and relative proportions of the bacterial flora. At present only the results of the radiological survey are available and these indicate active pulmonary tuberculosis in 9.4%, probable tuberculous pathology in 9.4% and possible tuberculous pathology in 4% of 222 cases. Evidence of pulmonary lesions probably non-tuberculous was found in 5.8% of the subjects. In addition, there were 6 cases of tuberculous disease of bone. Intradermal tuberculin tests gave positive results in 81% of the population.

During 1947 work done on intestinal parasitism showed a high incidence of infection with the thread worm (*E. vermicularis*) and also showed the presence of *Endamoeba coli* and of *Diphyllobothrium* in the feces of a limited number of subjects[3].

In 1947 the possibility of trichinosis was suggested by the marked incidence of *eosinophilia* and by certain stories of illnesses which were obtained, and this past year this possibility was explored fairly thoroughly. Two-thirds of the population was skin tested with *Trichinella* antigen and 51% of them reacted positively. Specimens of serum were collected for testing and these also show a high incidence of positive reaction. The source of the infection was sought by gathering samples of muscle from the polar bear, walrus, seal and the white whale, and examination of these by Dr. E. Kuitunen, School of Hygiene, Toronto, has shown infestation in the two polar bears from which specimens were obtained.

An interesting finding has been the presence of clinical hepatomegaly in approximately one-third of those examined. In certain cases the hepatomegaly is gross but it has been seen in otherwise apparently healthy individuals and no example of hepatic failure has been seen.

Numerous biochemical tests of hepatic function have given normal results. Needle biopsies were performed in three cases and histological studies show a fine, granular, fatty infiltration of parenchymal cells without any distortion of the architecture of the hepatic lobules. The cause of the liver enlargement remains obscure. The size of the liver has been seen to vary over periods as short as a fortnight. It is not related to changes in plasma lipids. Attempts were made to influence the liver size by means of diet and these experiments have shown that supplementing the natural diet with large doses of ascorbic acid and of the Vitamin B complex has no effect. However, carbohydrate and protein supple-

ments to their natural diet caused a return of the liver to a normal size during a four week period in an experimental group. The only biochemical change noted in this group during this period was an elevation of the total serum protein level[4].

MALCOLM BROWN, M.D.

References

1. Brown, Malcolm, Sinclair, R. G., Cronk, L. B., deSinner, F.; 1948 Proc. Can. Physiol. Soc. p. 6.
2. Sinclair, R. G., Brown, Malcolm, Cronk, L. B., deSinner, F.; 1948 Proc. Can. Physiol. Soc. p. 34.
3. Brown, Malcolm, Sinclair, R. G., Cronk, L. B., Clark, G. C., Kuitunen-Ekbaum, E.; Can. J. Public Health, November, 1948.
4. Brown, Malcolm, Sinclair, R. G., Cronk, L. B., deSinner, F.; 1948 Proc. Can. Physiol. Soc. p. 5.

ARCTIC INSTITUTE RESEARCH PROGRAM

The following research projects in progress at the end of 1948 are financed in whole or in part by the Arctic Institute through its grant-in-aid programme. Many of the projects are being supported in cooperation with the United States and Canadian governments.

Anthropology

The extension of the tree-ring chronology in Alaska by further excavation so as to date the early phases of Eskimo culture in the Bering Strait region.

Professor J. L. Giddings, Jr., Department of Anthropology, University of Alaska, College, Alaska.

Field work during the summer of 1948 was carried out in the Norton Sound area. Tree-ring collections exceeded expectations. Systematic large-scale excavation of archaeological sites revealed not only stratified culture sequences of the Eskimo which parallel those in other areas, from earliest to recent, but also evidence of a new form of culture which appears to be the most ancient yet recorded for the Eskimo area.

A study of the ethnologic and physical anthropology of Eskimos in the region between Norton Sound and the Alaska Peninsula.

Helge E. Larsen, Department of Ethnography, National Museum, Copenhagen, Denmark.

Field work carried out along the Bering Sea coast during the summer of 1948 resulted in the discovery of Ipiutak-like cultures at various places around Goodnews Bay. Wood from one of the houses provided samples for tree-ring dating and also parts of charred grass baskets—the earliest known occurrence of basketry in the Eskimo cultures.

Cooperative study to determine the developmental sequences in human culture, vegetation, etc., in Yukon Territory.

Dr. H. M. Raup, Director of the Harvard Forest, Harvard University, Cambridge, Mass.

Field work was carried out during the summer of 1948 in cooperation with Dr. Frederick Johnson of the Peabody Foundation for Archaeology. The results are reported to be excellent.

Biology

Botanical investigation of portions of the Brooks Range and Arctic Slope of Alaska.

Professor William S. Cooper and Lloyd A. Spetzman, Department of Botany, University of Minnesota, Minneapolis, Minnesota.

Field work was carried out during the summer of 1948 in the vicinity of Lake Schrader, Lake Peters, Umiat, Ikiapuk Pass, Sadlerochit River, Barter Island, and Point Barrow. Much of this work was in cooperation with Dr. P. F. Scholander of the Arctic Research Laboratory at Point Barrow.

A study of the ecology of Rana sylvatica in relation to permafrost, season, foods, and adaptations.

R. D. Hamilton, Museum of Zoology, University of Michigan, Ann Arbor, Michigan.

Field work during the summer of 1948 was carried out in selected places along the major river systems from Kotzebue, Alaska, to Coppermine, Northwest Territories.

Study of the microfauna of Arctic shore areas, (Coppermine and Hudson Bay).

Dr. Marie Hammer, Holte, Denmark.

Field work in northern Canada in the vicinity of Aklavik, Coppermine, and

Churchill was carried out during 1948. 591 soil samples, including in many instances associated plant specimens, were collected. Dr. Hammer is making a detailed study of the microfauna contained in the soil samples, at the Museum of Comparative Zoology, Harvard University.

A study of the breeding habits of the Canada Goose on the west coast of James Bay.

Harold C. Hanson, Illinois Natural History Survey, Urbana, Illinois.

Field work was initiated in 1946 and continued during the summer of 1947. An illustrated preliminary report on the work in 1946 has been completed as well as a bound collection of photographs taken in 1947. Work is proceeding on the plants and mammals that were collected.

A biological investigation of the Nueltin Lake area in Keewatin and Manitoba, with special emphasis on the life histories and ecology of mammals, birds and fishes, and on the distribution of plants.

Dr. Francis Harper, Mount Holly, New Jersey.

Field work was completed in 1947 and the past year has been devoted to submitting some of the material collected to different authorities for study and to preparing reports on the remainder. A report on the fishes has already been published (Fowler, Henry W. and Harper, Francis. Fishes of the Nueltin Lake Expedition, Keewatin, 1947, *Proc. Acad. Nat. Sci. Phil.*, 1948, vol. C, pp. 141-184).

An analysis of population structure, gene frequencies and hybridization of Arctic and Subarctic species of Colias.

Dr. William Hovanitz, Department of Biology, Wayne University, Detroit, Michigan.

Arrangements are being made for reproduction and distribution of the final report which is based on two seasons of field work in northwestern Canada and on museum work. It outlines in detail the known distribution of *Colias* species in North America and the frequencies of the color phases.

A forest-botanical study of portions of Ungava Peninsula.

Dr. Ilmari Hustich, University of Helsinki, Helsinki, Finland.

Field work along the east coast of Hudson Bay as far north as Port Harrison was completed during the summer of 1947. Special attention was paid to forest conditions. Field work by Dr. Hustich was continued in the summer of 1948. Areas visited were the vicinity of Lake Ducharme and Lac Alex in the Lake St. John region and Knob Lake in central Ungava. A preliminary report of the field investigations has been completed.

A study of certain ornithological problems in the Norton Sound region of Alaska.

Henry C. Kyllingstad, Mountain Village, Alaska.

The investigation resulted in the discovery of the nesting grounds of the bristle-thighed curlew, the last North American bird whose breeding grounds and fledglings had not been previously found. The field work was carried out in the vicinity of Mountain Village in cooperation with Dr. Arthur A. Allen of Cornell University who was supported by the National Geographic Society.

An ecological study of the transition zone between tundra and forest in Ungava.

Professor J. W. Marr, Department of Biology, University of Colorado, Boulder, Colorado.

Field work during the summer of 1948 was carried out in northern Ungava. The lower eighty miles of the Leaf River was examined as well as the full length of the Koksoak for purposes of comparison.

A comparative study of mite fauna of the North American Arctic (Barrow and southward).

Dr. Irwin M. Newell, University of Hawaii, Honolulu, Hawaii.

Field work was carried out during the summer of 1948 at a number of locations in the Aleutian Islands from Attu eastward and along the Alaskan coast from Point Barrow southward. The cooper-

ation of the U.S. Coast Guard in providing transportation on the ice-breaker *Northwind* and the help received from service groups made it possible to cover twice the area originally planned.

A study of the flora and vegetation of the Canadian Eastern Arctic and Subarctic.

Professor Nicholas Polunin, Department of Botany, McGill University, Montreal, Quebec.

Field work during the summers of 1946 and 1947 provided enough additional information on certain critical areas to permit completion of volumes 3 and 4 of Professor Polunin's *Botany of the Canadian Eastern Arctic*. Field work also included the initiation of aerobiological studies over the Canadian Arctic.

A study of the habits and economics of fur animals as factors of management and conservation.

Professor H. F. Quick, Yardley, Pa.

Field work was carried out in northwestern Canada, principally in the vicinity of Fort Nelson, B.C., during the winter of 1947-48 and was continued during the winter of 1948-49.

A study of the mammal population of the Canadian Arctic north of Latitude 60° and its value for survival.

Dr. A. L. Rand, Chicago Natural History Museum, Chicago, Illinois.

Almost all the data on the various species have been collected and the final report is in course of preparation.

A botanical survey of Ungava Peninsula between the head of the Romaine River and Ungava Bay.

Dr. Jacques Rousseau, Montreal Botanical Garden, Montreal, Quebec.

Field work was carried out during the summer of 1947 and additional work bearing on the project was completed during the summer of 1948 in the course of a traverse of the northern part of Ungava Peninsula in company with Dr. Aubert de La Rue and representatives of the Geographical Bureau and National Museum, Ottawa.

A study of blood and tissue lipids of Arctic animals in relation to post-hibernation fat depletion.

Professor Charles G. Wilber, Biological Laboratories, Fordham University, New York, N.Y.

Field work was carried out during the summer of 1948 in cooperation with the Arctic Research Laboratory at Point Barrow, Alaska. Professor Wilber was assisted by X. J. Musacchia. Places visited in northern Alaska in addition to Point Barrow included Aluktuk River, Teshekpuk (Big Lake), and Meade River. Since no information was available as to lipid values for the tissues of any arctic mammals, a primary task was to ascertain the normal range for these values.

Some phases of the relation of selected faunae population (avian and mammalian) to weather at Kluane Lake, Yukon Territory.

Dr. L. W. Wing, Agricultural and Mechanical College of Texas, College Station, Texas.

Field work during the summer of 1948 was carried out principally in the vicinity of Johnson's Crossing on the Alaska Highway. A number of records were obtained of bird activities in relation to weather and a study was made of the ecological distribution of birds and mammals.

Geography and Geophysics

A study of the terrain of the Ungava Peninsula.

Professor G. Vibert Douglas, Department of Geology, Dalhousie University, Halifax, Nova Scotia.

Field work along the Labrador coast was carried out during the summer of 1947 and a flight made across Ungava Peninsula in April 1948. These and earlier field investigations by Dr. Douglas have been accompanied by an intensive study of the literature.

A geographical study of the coasts of Hudson Bay and Strait.

T. H. Manning, 37 Linden Terrace, Ottawa, Ontario.

Previous field work by Mr. Manning eliminated the need for additional field observations. A detailed examination of

the literature and aerial photographs is being made and the final report is in course of preparation.

A study of the terrain of the Canadian Eastern Arctic (exclusive of the Ungava Peninsula).

Dr. T. T. Paterson, Swanley House, Buckhaven, Fife, Scotland.

Field work on Southampton Island and along the west coast of Hudson Bay and Melville Peninsula was carried out during the summer of 1947 to supplement Dr. Paterson's previous field experience in the Eastern Arctic.

The use of aerial photographs for predetermining ground conditions influencing engineering structures and construction practices in the arctic and subarctic regions of North America.

Professor Donald J. Belcher, School of Civil Engineering, Cornell University, Ithaca, N.Y.

Following field work at a number of places in Alaska and the Canadian Arctic and Subarctic during the summers of 1947 and 1948, the final report has been outlined and partially assembled.

To gather and compile all available data on permafrost in the Norman Wells area and to continue a study of permafrost and related soil and snow mechanics with a view to improving the present methods of road building, communications and general construction in the Arctic and Subarctic regions.

R. A. Hemstock, Devon, Alberta.

Following two seasons of field work in 1947 and 1948, the final report is now in course of preparation. Emphasis is being laid on detailed investigations of soil temperatures under different conditions. A thorough study of the roads in the area has been made to check the suitability of various methods of construction.

Project Snow Cornice—the establishment of a glacial research station on the Seward Glacier in the area of the Alaska-Yukon boundary.

Walter A. Wood, Arctic Institute of North America, Broadway at 156th Street, New York 32, N.Y.

A field party under the leadership of Walter A. Wood established the research station during the summer of 1948. Dr. Robert P. Sharp of the California Institute of Technology directed the glaciological and geological work, and groups representing the National Research Council of Canada cooperated closely in carrying out geophysical investigations on the Seward Glacier. The research station was closed in the autumn but plans are being made for its reëstablishment during the summer of 1949. A full account of the work has already been published, (Wood, Walter A. Project "Snow Cornice", *Arctic*, 1948, vol. I, pp. 107-112).

A study of the oceanography of the Canadian Eastern Arctic.

Professor M. J. Dunbar, Department of Zoology, McGill University, Montreal, Quebec.

Field work initiated during the summer of 1947 produced valuable information concerning temperatures, salinities, and oxygen tensions in the waters of Ungava Bay. An intensive study of the literature has been pursued and preparation of the final report started.

Geology

Geological study of the East Coast of Hudson Bay.

Dr. E. H. Kranck, Department of Geology, McGill University, Montreal, Que.

Field work was completed in 1947 and the past year has been devoted to a petrological examination of the rocks collected and the preparation of the final report.

A study of the geology of Ungava Peninsula between Ungava Bay and Hudson Bay.

Dr. Edgar Aubert de La Rue, Office de la Recherche Scientifique Coloniale, Cayenne, French Guiana.

A traverse of the area between Povungnituk on the east coast of Hudson Bay and Payne Bay on Ungava Bay was made during the summer of 1948 in company with Dr. Jacques Rousseau and representatives of the Geographical Bureau and National Museum in Ottawa. A detailed preliminary report of the field work has been completed and work is progressing on the final report.