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NORTHERN NEWS

Glacial-geomorphological research in the Howells Valley and the watershed district of Central Quebec-Labrador

With two field assistants, T. C. Grewar and D. H. Tarling, the writer spent the summer of 1958 expanding the work carried out in 1957 in the immediate vicinity of Knob Lake. The study area comprised the whole of the Howells Lake and River system between the southern shores of Helluva Lake (55°18′N.) and Stakit Lake (54°44′N.), the Quebec-Labrador watershed, and the neighbouring slopes of the Swampy Bay River, which joins the Koksoak-Kaniapiskau drainage farther north. The whole area, with the exception of the Shield rocks of the western slopes of the Howells Valley, is underlain by the Proterozoic sediments of the Labrador Trough.

The party was able to move out from Knob Lake by truck, using the exploration bush tracks of the Iron Ore Company of Canada. On June 22 the first base camp was established 17 miles northwest of Knob Lake on a spur overlooking Triangle Lake, Labrador. During the next 6 weeks work was conducted from this point, a sub-base having been established on the granite-gneiss

of the western slopes of the Howells Valley, and another on the sedimentary rocks at O'Nelly Lake. The second half of the season, beginning on August 5, was spent working from a base camp 1 mile east of Boundary Lake, Quebec. During this time a sub-base was established on the granite-gneiss 2 miles west of Harris Lake, and another sub-base was placed 2 miles northwest of the northern end of Lac Lespinay, which drains into the lake complex occupying the wide valley north of the town of Knob Lake and thence by way of the Swampy Bay River to Ungava Bay.

During the first half of the season, with the exception of a rain-hail-snow squall of the morning of July 1, extremely good weather prevailed, consequently, more work was accomplished than had been planned for the southern section. Despite the delays caused by 5 inches of rain, which fell in August, the field programme was completed.

Interest was centred on the widespread glacial drainage channels, which were examined in the light of the classification arrived at following the 1957 field season[1] as a means of determining both the position and condition of the wasting ice-mass. Attention was also paid to a remarkable series of delta-like forms, which are found at different elevations along the eastern slopes of the Howells system.

The distinctive appearance of the drainage channels on air photographs[2] made possible the concentration on the critical sets of channels that stretch from the highest parts of the watershed at over 2,600 feet to the bottom of the Howells Valley at 1,700 feet. The direction of flow of the marginal melt waters, which is consistently to the south in the southern section, changes to the north in the vicinity of Joan Brook. At this point marginal drainage channels with a northerly gradient are found only 1 mile from the nearest evidence of a southerly flow of melt waters. The ground in between is characterized by hummocky till and shows evidence of the subglacial escape of water to the local base level of the Howells waters.

Only minor streams now run across each of the delta features, which are clearly not of recent origin. Examination in the field revealed that the deltas, which often drop as much as 50 feet per mile, are sub-serial forms that were most probably scattered over the bedrock at a time when ice impinged upon the Howells' slopes. Their morphology, slope, and composition are incompatible with deposition in water. This fact and the presence of marginal drainage channels a few feet above the present water-levels strongly suggest that there was no late-glacial lacustrine phase in the Howells Valley. Furthermore, strong evidence of subglacial drainage is to be found from the highest cols in the watershed down to present lake level in the Howells Valley.

Fair evidence of striae was observed a 10-mile front on the western slopes of the valley and over the entire area to the east as far as the higher slopes of the Swampy Bay River system. The direction of the final movement of the ice is by no means unequivocal, although well-developed drift tails throughout the western part of the area indicate final movement from the south-southeast to north-northwest along the valley itself and parallel to the neighbouring ridges. The composition of the till on both sides of the Howells Valley is not inconsistent with this interpretation.

The principal conclusion based on the evidence collected over the past two years is that the ice-sheet in this central district melted down to reveal the ridges as nunataks, the ice thereby becoming separated into large masses occupying broad vales that lie between the ridges of the Labrador Trough. The relatively low relief of the region ensured the extreme thinness of these separated ice-masses, which were inert, any movement being purely local under the influence of gravity. The high rate of downcasting is attested by the well-developed channel forms and the wide

[1] An article dealing with this classification is in course of preparation for publication.

[2] Derbyshire, E. In Press. The recognition and classification of glacial drainage channels from aerial photographs. Geografiska Annaler.

spacing of marginal features; it is comparable with the highest figures obtained from the height of land in northern Sweden and Norway[3]. Well-developed subglacial drainage systems, evidence of marginal drainage down to present water-levels and the abundance of thick till deposits throughout the Howells Valley effectively dismiss the notion of a late-glacial lacustrine phase in favour of the occupation of the valley by a dwindling ice-mass. The neighbouring valleys, including the part of the Swampy Bay River valley investigated and the broad Knob Lake vale, also shared this history. There is no support whatever for the idea of broad, ice-dammed lakes.

The party returned to Knob Lake by bush track on September 4, one day's field work being conducted from there.

This work was undertaken with the help of a grant from the Banting Fund, administered by the Arctic Institute of North America. A detailed report will be presented to the Institute later.

E. DERBYSHIRE

Biological studies in Ungava during 1958

During the summer of 1958 the writer, with the assistance of Mr. C. W. Nicol of Cheltenham, England, was working in the False River area of Ungava, south of Ungava Bay. The principal object was as wide a study as possible of the ethology and ecology of the sea ducks (Tribe Mergini), and the False River area was chosen as a spot likely to provide nesting conditions for at least four species of this group. This was indeed the case: five species — if eiders are included — were found to breed in or near this region in 1958. However, conditions for working with these birds were extremely difficult as False River in particular proved to be an area regularly hunted over by Eskimo and part-Eskimo, who often shoot literally at everything living and within reasonable range, and are always a potential menace to the stability of local duck populations. For this reason pairs of old-squaws that established breeding territories in the area chosen for the camp at the north end of Kohlmeister Lake moved away before egg laying began. Furthermore, the well-established eider colonies on the two small islands in False River about 5 miles north of Kohlmeister Lake suffered severe losses due to regular visits by the Eskimo for the taking of eggs of herring gulls, which also nested in large numbers on the islands, and of eggs of the eiders themselves. There was great mortality of embryos due to desertion as a result of constant interference and greater numbers of eggs were destroyed by gulls when the eiders vacated their nests quickly and failed to cover them.

As a result of this unsettled condition the area was unsuitable for the observation of normal breeding behaviour. However, as the only possible method of travel was by kayak or on foot and the tides in the river are very strong it was decided to work on other problems in the same area.

Consequently, work was started on two topics of particular interest in the region: (a) the natural mechanism of carcass disposal, and (b) the behaviour of colonial web-making spiders. Shortly after beginning work on these two projects it was found possible to work with young Mergini and so a third project was undertaken, (c) the maturation of behaviour patterns in young Mergini. Work on all three problems was continued throughout the season.

(a) *The natural mechanism of carcass disposal.*

The Subarctic with its very variable weather conditions would be expected to provide particular problems for invertebrate scavengers. To investigate these problems the inhabitants of carcasses and offal were studied, beginning in mid-June. Materials used were carcasses of muskrat, young porcupine, and eider duckling; a dish of mixed offal; two eider eggs at different stages of decay, and three pairs of tubes of solid meat and fragmented meat, placed in

[3] Mannerfelt, C. M. 1945. Nagra Glacialformologiska Formelement, etc. Geografiske Annaler, 27:1-239.

different situations. A daily record was kept of animals visiting, or living on, the material, using odour, liquefaction and disintegration as indicators, and relating these to temperature, time, and general weather conditions. None of the materials were entirely vacated by its inhabitants before we left the area on September 4.

(b) *Behaviour studies in a colony of web-making spiders.*

Subarctic weather conditions create special problems for spiders making orb-webs. In the immediate surroundings of the camp large numbers of spiders of various kinds were found and in particular a very large, diffuse colony of orb-web builders on a south-facing cliff that provided shelter from the prevailing northerly winds. A portion of this colony, containing about 40 webs, was selected for study, and for convenience divided into four sections. Records were kept of the daily changes in the state of repair and repositioning of webs in relation to insect abundance and weather conditions. Furthermore, ethological observations were made when possible, particularly with respect to web-building and reactions to prey.

During the season certain webs were selected for more detailed observation. A number of spiders from both selected webs and others have been brought back alive for further study.

(c) *The maturation of behaviour in young Mergini.*

The principal interests of the writer lie with the ethology of the Mergini. This tribe, which includes the mergansers, the golden-eye group, the old-squaw and harlequin, the scoters, and possibly the eiders, is a taxonomic assemblage of great biological interest, particularly to the behaviourist.

As mentioned above, extensive work on epigamic behaviour in this group was impossible, but enough was observed of display in common eider and red-breasted merganser to make possible a comparison with previous observations of these species at the Wildfowl Trust Collection in England. Furthermore, enough was seen of old-squaw display to suggest behavioural relationships to the above two species. As the season progressed and well-incubated eider eggs became available from the islands down-river, and broods of old-squaw moved into the camp area from which they had been scared away during the nesting period, work became possible on the maturation of behaviour patterns in ducklings. It was possible to hatch five eiders separately in camp. Four of these were imprinted to my self, but the fifth was not imprinted at all. Detailed observations were made of their behaviour, beginning with the mechanism of hatching to their reactions to predators. All normal aspects of the behaviour of the birds except display seem to be well developed within a few days of hatching.

The behaviour of my eiders was compared with that of two old-squaw broods in the area and later with that of a few wild immature eiders.

The two most important conclusions resulting from this work with ducklings appear to be: 1. there is a highly developed innate adaption to the environment, e.g. the catching of live food under water when only a few hours out of the egg, combined with 2. the necessity for a mobile guide and brooder, which normally, of course, is an adult female of the same species.

As a matter of routine, daily records were kept of birds in the area. Among the more interesting observations were the presence of a flock of approximately 500 American golden-eye for some weeks in the False River estuary; three pairs of greater black-backed gulls holding territories in the herring gull colonies on the islands in the river; redpolls nesting in the vicinity of camp; a pair of green-winged teal, which apparently bred on Kohlmeister Lake; and a flock of approximately 2,000 common and king eider broods and moulting adults in the river estuary on August 31.

It is intended to publish details of the above studies in various technical journals.

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acknowledged. Thanks for generous assistance are also due to a number of firms, in particular to Messrs. Fry-Cadbury Ltd., C.I.L. Ltd., and Imperial Tobacco Co.

PETER M. DRIVER

Erratum, Vol. 11, No. 2

Page 121, line 6 from bottom, for Ladder-backed woodpecker, *Dendrocopos scalaris read* Northern (ladder-backed) three-toed woodpecker, *Picoides tridactylus.*

GEOGRAPHICAL NAMES IN THE CANADIAN NORTH

The Canadian Board on Geographical Names has adopted the following names and name changes for official use in the Northwest Territories and Yukon Territory. For convenience of reference the names are listed according to the maps on which they appear. The latitudes and longitudes are approximate only.

Ogden Bay, 66 NW. and 66 NE.

(Adopted January 16, 1958)			
Name confirmation			
Klutschak Peninsula	67°55′N.	98°30′W.	not Henry Peninsula
(Adopted March 6, 1958)			
Trickle River	68°00′	96°27′	
Tern Lake	67°48′	97°02′	
Red Bay	67°55′	97°12′	
Trefoil Bay	67°41′	97°08′	
Crane Peninsula	67°44′	97°06′	
Squirrel River	68°00′	96°40′	not Anderson River
(Adopted June 1, 1958)			
Weir Creek	67°48′	97°05′	not Fish-trap River nor Trap River
Shelter Creek	67°56′	98°02′	not Tent-ring River nor Ring River nor Canoe Creek

Prince Patrick Island, 99 SE. and 89 (S. ½)

(Adopted January 16, 1958)			
Name change			
Cape Beuchat	77°30′N.	113°10′W.	not Cape Beauchat

Devon East, 48 NW. and 48 NE.

(Adopted January 16, 1958)			
Name confirmation			
Cape Hardy	75°51′N.	83°50′W.	
Altered applications			
Cape Skogn	75°47′	84°15′	
Cape Sparbo	75°50′	84°02′	
Brae Bay	75°49′	83°25′	not Broe Bay
Name change			
Treuter Mountains	75°42′	82°30′	not Truter Mountains nor Trenter Mountains

Rae Strait, 57 SW. and 57 SE.

(Adopted January 16, 1958)			
Swan Lakes	68°40′N.	95°55′W.	not Porter Lakes
(Adopted October 2, 1958)			
Hill Point	69°14′	96°22′	

Somerset Island, 58 SW. and 58 SE.

(Adopted January 16, 1958)		
Altered applications		
Fury Point	72°42′N.	92°14′W.
Fury Beach	72°48′	91°54′
Cape Granite	73°43′	95°43′