were collected. On July 2 another female was caught in a trap; a fifth was seen on July 23. Ermine pelts are commonly brought by the Eskimos to the Perry Island Hudson's Bay Post.

Gulo luscus. Wolverine.

Common, one was seen on May 31 and another on July 13. Two young were seen near Laine Creek on July 31.

Phoca hispida. Ringed seal.

Very common and hunted heavily by the natives.

Phoca groenlandica. Harp seal.

Occurs, but it is very rare; one skin was seen at an Eskimo camp. None were seen.

Erignathus barbatus. Bearded seal.

Periodically skins of this seal are brought to the Hudson's Bay Post, but it is uncommon.

Rangifer arcticus. Barren-ground caribou.

First seen on June 17; and periodically later, but they were never numerous at Arlone Lake. However, a very large herd was seen and hunted heavily along Perry River by Eskimos.

Ovibos moschatus. Musk-ox.

According to Gavin[6] it was common in the Perry River region about 1940. The large number of implements made of musk-ox horn supports this. None were seen, but two skulls were found near Arlone Lake. A third skull was found near Perry River. The introduction of the rifle into the region was probably the main cause for the decline of the number of musk-oxen. According to the Eskimos they are still found in the region of MacAlpine Lake, at the headwaters of Perry River.

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SOME QUATERNARY EVENTS OF NORTHERN ALASKA*

Despite the current increased interest in Quaternary research in northern Alaska the information now available is not sufficiently complete to understand, except in general terms, the past events of the region. Detterman *et al.*[1] updated and extended the knowledge of Pleistocene events, and in so doing assigned the glacial deposits of the Killik River area (about 68°42'N.) to the Itkillik (early Wisconsin?) age. Discovery of an organic deposit in 1963 necessitates re-examination of the glacial chronology and some comments on the present and past climate of the upper Killik River area.

The studies reported here were carried out where the Killik River flows northward from the Brooks Range through the southern foothills. The valley is 2 to 5 miles wide and has terrace remnants 70 to 100 ft. high. Field observations indicate that most of the valley floor was once covered with glacio-fluvial deposits, most of which were subsequently eroded away.

Along the left bank of the Killik River 0.5 mile south of the southeast corner of Imiaknikpak Lake is a terrace, the upper 70-foot section of which is shown in Fig. 1. At the 0- to 10-foot depth gravel-free sands show virtually no evidence of stratification, which, together with the presence of active sand dunes confirms the reworking and transportation of surficial material by wind action (Fig. 1 - K1, K5 and K6). Below a depth of 10 feet sands are poorly stratified (Fig. 2) but show definite evidence of being water-deposited. A histogram showing the approximate particle-size distribution of the 10- to 40- foot section is given in Fig. 1 - K2.

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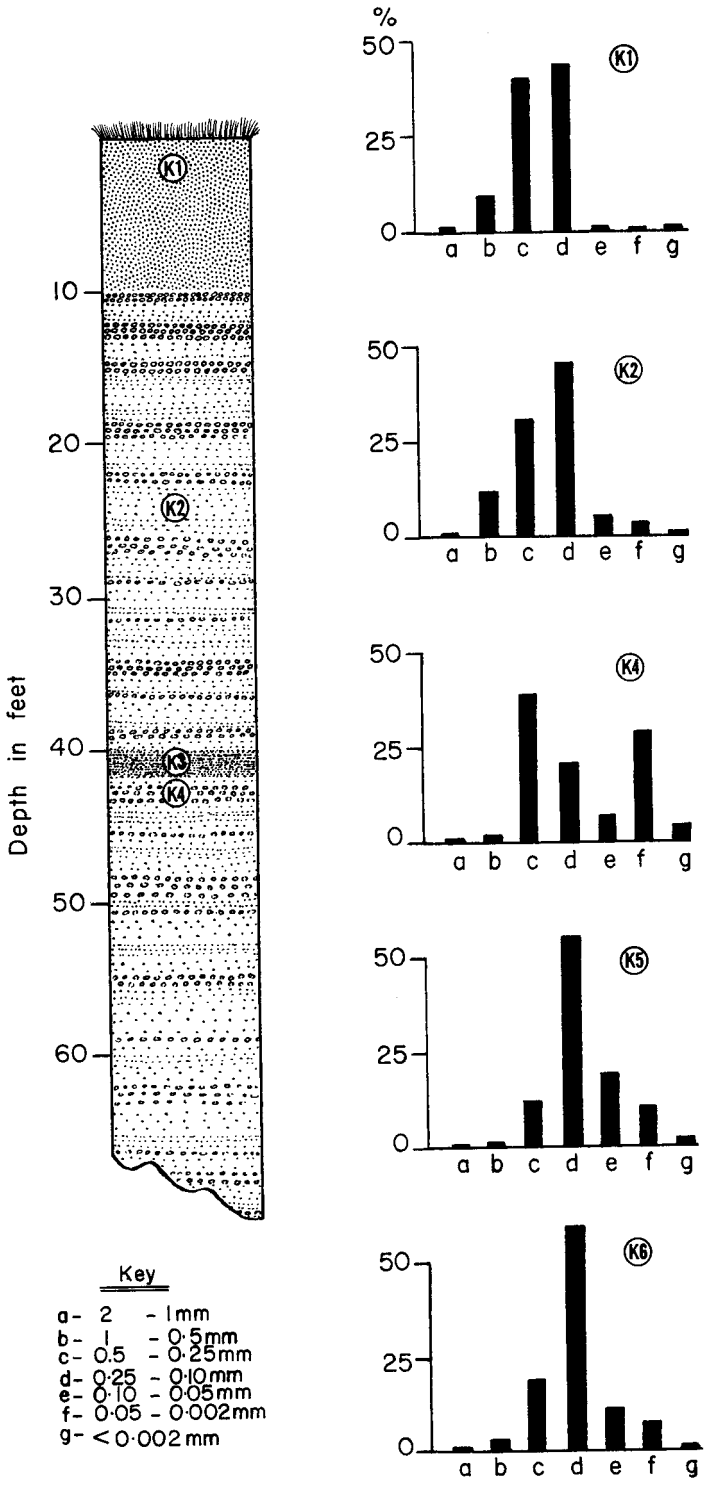

Fig. 1. Quaternary deposits along the Killik River, northern Alaska. The upper 10 ft. consists of aeolian sediments. Below the 10-ft. depth, materials have a low order of stratification. Histograms K1, K2, and K4 are from sites shown in the drawing. The histograms K5 and K6 are of random samples from nearby sand dunes.

At the 40-foot depth, underneath the organic bed (Fig. 1 - K3), the histogram (Fig. 1 - K4) of the inorganic material is bimodal, with the fines in higher concentration than elsewhere in the stratigraphic column. This suggests that the organic material probably was transported into a temporary quiescent environment. At the 45- to 70-foot depth particle-size histograms are similar to that of Fig. 1 - K2.

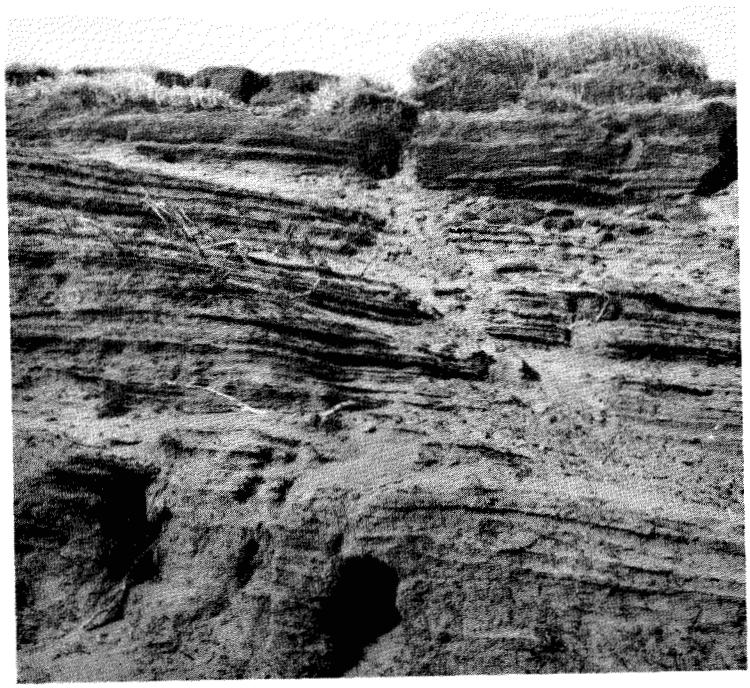

Fig. 2. View of the upper part of the Killik River terrace shown in Fig. 1. Note stratification of the sediments.

A rich organic bed (Fig. 1 - K3) was encountered at the 40-foot depth in which some of the plant remains were remarkedly well preserved. Fig. 3 shows some of the recovered larger plant remains. Alder (*Alnus*) leaves (4A), alder catkins (4B), willow (*Salix*) leaves (4C), and waterworn willow stems (4D) were found in abundance. Willow stems, about 1 inch in diameter, from this bed were identified by Prof. W. Harlow, Syracuse University, and the C-14 date of one willow stem was determined and found to be 5650 ± 230 years B.P. (Isotopes, Inc., Sample I-1006). This date corresponds to the Hypsithermal Interglacial of Deevy and Flint[2] and the late-Anivik Lake time of Porter[3], and it would probably coincide with the III (alder maximum) Pollen Zone of Livingstone[4]. Colinvaux[5] identified the pollen from a number of buried organic samples from northern Alaska and indicated that there was a general warming trend in northern Alaska since about 14,000 years B.P.

The current mean July temperature of the upper Killik Valley is about 50 to 52°F.[6]. Böcher[7] indicates that in North America the northern extension of alder nearly follows the 50°F. isotherm, which in turn suggests that the lower altitudes along the upper Killik River area have the minimum summer temperature requirements for the growth of alder. Although no alder is present along the upper Killik River, to the north near the junction of the Killik and Colville Rivers, there are occasional small clumps of alder. In the vicinity of Umiat, less than 100 miles

to the northeast, the mean July temperature is 54°F. and alder thickets are 10 to 12 ft. high. A factor that cannot be overlooked, however, is that in the Brooks Range, near Easter Creek at an altitude of about 3000 ft., a small grove of poplar (*Populus tacamahacca*) with heights up to 12 ft. is present.[8] If the climate of the upper Killik River is favourable for the establishment of poplar, it should also be suitable for alder. There is insufficient information to assert that the present climate of the upper Killik Valley is too rigorous to allow the growth of alder, but it is evident that although alder once grew in the upper Killik Valley it does so no longer. The age and composition of the organic bed described earlier in the report indicates that about 5650 years B.P. the climate of the upper Killik River area was as warm, if not warmer, than at present.

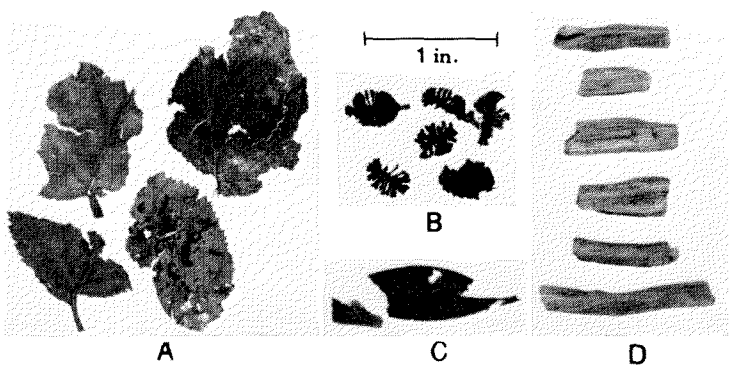

Fig. 3. Plant remains from the terrace shown in Fig. 1 at K3. (A) alder leaves, (B) alder catkins, (C) willow leaves, (D) water-worn willow stems.

Detterman *et al.*[1] indicated that glacial deposits of the area described are of Itkillik age, but the new evidence suggests that the glacial chronology of the area should be re-examined. According to the information presented here, deposits of the upper Killik Valley are no older than the Late Echooka age of Karlstrom[9], or the late-Anivik Lake age of Porter[3]. Detterman assigned the Itkillik glaciation to the early Wisconsin time. Porter assigned Anivik Lake time to the late Itkillik glacial events, the latter being correlated with the late classical Wisconsin glaciation of North America. It is not known whether the date of 5650 years is valid only for the drift of the valley or if it could be applied also to the adjoining uplands.

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