Description of Fennoscandian Tundra Ecosystems

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The tundra landscape of Fennoscandia is mostly alpine. The southernmost areas above the tree line, with annual mean air temperatures below 0°C, are found at about 59° N in southern Norway. A mountain range runs along the entire Scandinavian peninsula up to about 70° N and is geologically part of the Caledonian mountain range, intensely folded mostly in the Silurian period (Holte-dahl, 1960). The highest mountains are found in the western districts. An eastward tilt of an imaginary surface connecting the summits was caused by a stronger land upheaval during the Tertiary period in these areas than further east. Generally, therefore, higher mountains and more mountainous habitats for all life are found in Norway than in any of the other Fennoscandian countries (cf. Somme, 1968). The drainage divide is close to the western coast and the mountain slopes are therefore steeper to the west than to the east. During parts of Pleistocene time all Fennoscandia was covered with ice except for a few refuges in extreme maritime areas, and possibly also on a few of the highest mountain peaks. Glaciers are found even today all along the length of the mountain range, and they strongly influence the ecosystems near them. There are several plateaus in the mountain areas, partly incised by water erosion and abraded by ice movements. The ice movement caused formation of several moraines, and the quaternary deposit is often transported far from its geological origin (Holte-dahl, 1960; Låg, 1965; Rankama, 1965; Somme, 1968). Above the uplands rise snowy, high peaks, particularly in the central region of southern Norway. In Sweden most of the mountains are found along the Swedish-Norwegian border (a belt up to 100 km wide).

Fragments of arctic tundra are only found in the northernmost part of Finland and Norway. In these regions (Finmark and Lappland) much of the landscape is rolling or even relatively flat; well outside the mountain range; most elevations are below 300 m. The bedrock is mostly composed of granitic gneiss from the Precambrian Baltic shield. These rock types predominate even in many of the mountain areas further south, but here, and in the western mountain areas, younger bedrock formations (especially Cambro-Silurian) are also common. Most abundant in these formations are more or less metamorphic shisty bedrocks (as phyllite and mica shists), but crystalline limestone, dolomite and other types are also found (Holte-dahl, 1960; Somme, 1968). Both in the southwestern mountains and in western areas further north in Norway, igneous bedrocks (from the Ordovician period) are common in areas predominated by the shisty rocks. In
usually small pockets, serpentine rocks are found, biologically indicated by specific plants (RUNE, 1953); other plant species as *Viscaria alpina* are found to be indicators on heavy metals in the bedrock, e.g. cupper.

Man has used the Fennoscandian mountain areas for thousands of years for hunting and fishing purposes (e.g. from about 5000 B.C. at Hardangervidda, Norway). The possibilities have, however, been small for year round farming in most districts above the timber line, although it has been common to bring cattle and sheep from the lowlands up to the mountain areas for grazing during summer. In