WGM-13

UNESCO and the Sub-Arctic

Åkandevej 7 Lille Værløse Denmark 12 October 1966

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Dear Dick,

In late July I attended a symposium on the "Ecology of Sub-Arctic Regions" in Helsinki, Finland. The Symposium was sponsored by the United Nations Educational, Scientific and Cultural Organization (UNESCO), with the Finnish National Committee for UNESCO as hosts. The Symposium was interesting, as were the people attending it. This newsletter will tell a bit about what went on in Helsinki. A following one will describe the Symposium field trip to Finnish Lapland, with particular reference to the new Kevo Sub-Arctic Research Station of the University of Turku.

The Symposium was attended by 68 participants from 14 countries; 39 papers were presented during the 5 days (25-29 July) in Helsinki. A final day of meetings in Turku summarized the affair.

What is ecology and where is the sub-Arctic? These are fair questions but, for my own part, they are practically unanswerable if one is looking for universally-held definitions. I suppose the simplest definition of ecology is the relation between living things and their environment. I have often seen the term "human ecology" used, but the idea of rational man vs. his surroundings seems in another world compared with the irrational reactions between plants and animals and their environment. The Symposium spent no time discussing ecology, ecosystems and such things. But a lot of time was devoted to the sub-Arctic and its location. I came away rather well confused. The sub-Arctic boundaries bounced back and forth like a ping-pong ball as men of various disciplines outlined their sub-Arctic. Moira Dunbar wrote in The Arctic Frontier: "Even more difficult to define is the sub-Arctic. In fact no completely satisfactory definition has ever been put forward, and it is necessary to compromise on some arbitrary climatic boundary."1

The Arctic is generally thought to be the area having average temperatures during the warmest month (usually July) of less than  $10^{\circ}C$  ( $50^{\circ}F$ ). This temperature line follows, in a general way, what is known in the north as the tree line. The tree line itself is difficult to define--so the northern boundary of the sub-Arctic (and southern border of the Arctic) is hazy as well. One must discard

<sup>1.</sup> Macdonald, R. St. J. (ed.), 1966. <u>The Arctic Frontier</u>, University of Toronto Press, 311 p.



A sub-arctic landscape: the shores of Knob Lake, at Schefferville, Quebec

mental pictures of close forest growth suddenly ending and being replaced by rocky, treeless tundra stretching towards the north pole. This is just not the case in nature.

Instead, between the boreal forests and treeless tundra exists a zone in which trees become smaller and more sparsely situated as one goes north. This zone is the sub-Arctic. It has properties of both the boreal forests to the south and the treeless Arctic to the north. Many people think of it as a transition zone, an ecotone. Others are beginning to think of it as an ecosystem in its own right. In Russia the zone is called ljesotundra (forest-tundra); in Canada it is called the Hudsonian Zone. If tree line, the northern boundary of the sub-Arctic, is difficult to define in practice, the southern boundary of the sub-Arctic is even more vague. There has been a recent tendency to push the sub-Arctic southwards until reaching the so-called "closed" boreal forest. The map on page 3 shows roughly where the sub-Arctic is, according to a climatic definition. It is an area where the mean monthly temperature does not exceed 10°C for more than four months and where the average temperature of the coldest month is below freezing. The map is according to Moira Dunbar (1966) in her chapter of The Arctic Frontier and is also the same as presented



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by Kimble and Good (1955) in <u>Geography of the Northlands</u>. There is, of course, striking similarity between this map and the Middle North as described in my past two newsletters. The sub-Arctic map is valid only for the land areas. The marine sub-Arctic was not on the agenda at Helsinki.

Before moving to Denmark, the Mattox family lived in the sub-Arctic for four years. At Schefferville, Quebec we worked at the McGill Sub-Arctic Research Laboratory. We experienced the beauties of a short, but hesitant summer; we marveled at the awesome power of a winter storm raging for three days and nights; and we got used to being able to walk on the lakes from late October until mid-May. We were dazed speechless by the numbing world of an occasional fifty below zero day with its shower of ice crystals suspended in the calm air. More often, however, it was the incessant wind which seemed to be everyone's bête noire. The sub-Arctic for us was a thing of beauty, but tinged with the grim reminder that we must constantly play the game according to its own rules or move to more amenable climates. The McGill Lab was, until recently, a rather unique place of sub-arctic studies. Now other research stations are joining the slim ranks of northern stations where scientists and students delve into the mysteries of the sub-arctic zone.



A sub-arctic town: Schefferville, Quebec

Although I had lived in the sub-Arctic for a "tour", I had never attended a scientific meeting to discuss its problems. I went to Helsinki with great anticipation and, although the meetings were interesting, they were also disappointing. I knew last spring that <u>man</u> was not going to be a topic of conversation at the Symposium. I was grateful for the few scientists who did attempt to show the applicability of their research to the future needs and problems of the world. It would take someone smarter than me to knock pure science--but I am plagued by a cyclical impatience to discover how we are going to get at our pressing problems and how the north will fit into the whole scheme. My comments on the Helsinki Symposium, however, will lay aside my interest as a human geographer and present in brief form what was discussed about the sub-Arctic and how a UNESCO symposium can turn out to be a disappointing event.

The flight from Copenhagen to Helsinki is blessedly short. I knew, however, that a few old Dartmouth friends were flying in from Alaska, some men also from Chile and Argentina (change the title to include sub-Antarctic!). I wondered if they would fall victims of the arrhythmia (the current "in" talk of the dislocation of the human system due to crossing time zones) which plagued the Scandinavian participants of the Middle North Symposium in Wisconsin last April. Dr. John Reed and wife (Arctic Institute of North America) were on the plane from Copenhagen and on the bus in from Helsinki Airport I rehashed old Labrador days with Roger Brown, permafrost expert from Canada's National Research Council. Brown, and colleague Hank Johnston were in a state of hopeful suspense, with a trip to the Soviet Union planned for after the Symposium.<sup>1</sup>

In all, 68 participants gathered from 14 different countries (regrettably none from Denmark) at the Symposium headquarters, Hotel Otaniemi, outside Helsinki. Some eleven had wives in tow, not counting wives who were registered participants and scientists in their own right.

Finland had more scientists attending than other countries, followed by the USA, Sweden, Canada, Germany, France, UK, USSR, and Norway. Single participants came from Poland, Switzerland, Chile, Argentina, and Iceland.

The Symposium was quartered at Hotel Otaniemi, which is part of an ultra-modern international congress center. The center is 12 years old and is situated on a beautiful coastal promontory 6 miles west of Helsinki. An integral part of the congress center is the Institute of Technology, in whose lecture halls the Sub-Arctic Symposium convened. Two sessions were held each day. The first one, on Monday,

<sup>1.</sup> They spent parts of last weekend with us in Lille Værløse after what sounded like a fascinating 2-month stay in USSR, including several weeks at Yakutsk and a boat trip down the Aldan River to the gold mines.



Professor Paavo Kallio opening the Symposium

was devoted to opening remarks and words of welcome by conference chairman Paavo Kallio, Professor of Botany at Turku University. Short speeches were also given by Dr. S. Evteev of UNESCO, and by Finnish Minister of Education R. H. Oittinen.

The remainder of Monday was devoted to papers on definitions of the sub-Arctic, and to meteorology and climatology. The following day concentrated on snow and its importance to sub-arctic life (enthusiastically received not only for its scientific interest, but also because of the minor heat wave plaguing Helsinki at the time). Following sessions covered geomorphology (the study of landforms, their origin and explanation), perennially-frozen ground (permafrost), soils, vegetation, animals, forests and forestry, and bogs. In all, 39 papers were presented by 36 scientists. Some papers described the results of detailed investigations into sub-arctic phenomena; others were valuable for their attempt at synthesis; a few pointed towards work needed to be done. Any detailed treatment of them would be impossible in this newsletter. The Symposium proceedings will be published soon. I found several papers and remarks of particular interest. Soviet geologist S. Evteev, of the UNESCO offices in Paris (Natural Resources Research Division), gave a short description of the background of the Symposium. In the past, UNESCO has concentrated mainly on the world's arid zones and the humid tropics. Their interest in the rational use of natural resources, based on scientific knowledge, led naturally to another large area of the world which might become important in the future--the sub-Arctic. The Finnish Minister of Education, R. H. Oittinen, stressed the importance of studying Lapland as an economic necessity. When one considers that of all the world's people living north of the 60th parallel, over 35% live in Finland, one sees the reason for Finland's vital interest in northern studies.

Philip Johnson of CRREL (U. S. Army Cold Regions Research and Engineering Laboratories, Hanover, N. H.) presented, possibly for the first time, a comprehensive treatment of remote sensors and their potential in future research efforts. Remote sensing is the noncontact acquisition of information in any portion of the electromagnetic spectrum from aerial platforms (from planes to satellites). Johnson was not only articulate and precise, he also attempted to relate his special research interests to larger world problems--



The Symposium's session on meteorology

the population explosion and inbalance of resource distribution and nutrition. which will be burning issues for a long time to come. There were aspects of Johnson's subject which could not be discussed at a public meeting. But the remote sensing applications which were presented were truly spectacular. For example, the properties of forests which could be determined from the air are leaf area, stem volume, species diversity, weight and chlorophyll content of vegetation. Other determinations possible are the kind and density of larger animal populations; heat, water vapor and CO<sub>2</sub> fluxes of the earth's surface; water content of soils and vegetation; depth and density of snow, and more. These observations are carried out by recording emissions or reflections of energy quanta from various portions of the electro-magnetic spectrum--ultra-violet through visual, infra-red, and microwave bands. From the above examples, some obvious applications would be the inventory and mapping of resources, describing the flow of matter and energy, and evaluating change for alternative solutions in the management of various environments (ecosystems) of the earth.

The population of sub-arctic areas is probably about 8-10 million, so that the large land area involved is thinly populated and little used. But the potential is not as great in the sub-Arctic as in some other areas. Roughly 40% of the Canadian forests are sub-arctic, of which most are incapable of producing crops of merchantable timber. In Finland, although the timber resources of the sub-arctic part are large, the total yearly growth is only about 2% of the total for the country. But we are still faced with the necessity of answering the question of how much timber the sub-arctic forests can deliver on a sustained yield basis without danger to the existence of the forests. What special forestry methods should be used under sub-arctic conditions? How may wood production be increased in sub-arctic forests? Important questions. The Finns, with their long experience in such matters, made valuable contributions at Helsinki.

In the use of sub-arctic peatlands, the Finns showed themselves again in the fore. A new method for the use of northern peatlands, conversion to artificial lakes for power requirements, was discussed. Draining peatlands for silviculture, reindeer grazing, and peatland cultivation were other timely topics raised. The final conclusion stressed the future significance of nature conservation, hiking, and the tourist trade.

The wide range of topics covered at Helsinki was of great interest. I got the feeling, however, that the exchange of ideas might have been much easier and more profitable if the meetings had been run in a different manner. I am a novice in the symposium and academic convention field, but I now have some rather definite ideas about how such affairs should be run. The Symposium provided good and bad examples of the ideal. In general, a poor opening (not the opening remarks) and a disappointing final session sandwiched the almostautomatic reading of papers. While their content was interesting, the lengthy process of delivering them took up most of the time available with the result that stimulating comments were at a minimum.

The general Symposium organization was adequate, but not outstanding--a faint lack of communication and information. UNESCO, with wide experience in such meetings, should by this time know how to run an academic gathering to the maximum benefit of all participants and their countries. I felt, however, that UNESCO did not exhibit this wide experience at Helsinki. Perhaps I am being too harsh, possibly the point is irrelevant. But I sympathized with the Canadian scientist who complained to me that, as a professional attender at an increasing number of symposia, he was disappointed and frustrated when some meetings were not run as well as they could have been. The Alaska Science Conference of 1965 was pointed out to me as a well-run affair. Doubtless, the Helsinki meetings fared poorly by comparison, in the eyes of those who attended both.

What, specifically, was wrong with the Helsinki meetings? Despite UNESCO's preliminary information notes which stated that "introductory reports on each topic of the programme will be prepared and circulated in advance for discussion at the symposium", this was not done. No discussions were held on the basis of common familiarity



A chance for personal contact: discussion of a point by (1-r) W. Pruitt (Canada), T. Ahti (Finland), and B. Tikhomirov (USSE)



## (1-r) S. Evteev (USSR), G. H. Johnston (Canada), and R. J. E. Brown (Canada)

beforehand of the papers to be presented. Some of the papers to be read were distributed to the participants as they arrived the day before the Symposium began.<sup>+</sup> I struggled through the opening paper into the late night hours. To my dismay, this paper was read the next day, word-for-word (all 17 single-spaced typed pages of it) by its author in 1 hour 25 minutes, leaving precious little time for discussion. It did, in effect, almost bludgeon the conference to death before it got started, and, unfortunately, set the style for most of the other papers. The meetings recovered, but no sessions offered valuable in-depth discussions. Had papers been circulated to all participants a month or so before the meetings, I believe the Symposium would indeed have been a symposium. The result instead was that most of the time was eaten up by paper-reading. Little time was left for discussion, with a consequent loss of spontaneity and good old give-and-take. The Russian tradition of accepting questions only in writing and delivering the answers the next day (after presumably a high-level hotel room conference) added to the squelching of potential comment.

<sup>+</sup> Only 19 out of the 39 papers were printed. Of these, only 7 had bibliographies, the rest were chopped for some reason.

The official languages of the Symposium, as in UNESCO itself, were French and English. Very definite language difficulties were evident. I am certain it was because of this that our Soviet colleagues neither understood nor participated as much as they might have, to the loss of everyone. Translation booths are an excellent idea and absolutely necessary for simultaneous interpretation. They should, however, be kept closed and still be able to maintain uninterrupted connection with what the speaker is saying. Small technical aids such as microphones, lights, pointers, slide changing mechanisms, and blackboard and chalk and their locations and operation should be pointed out to each speaker before everything begins. If technique is lacking or insufficiently exploited in these respects, the end result is loss of communication. When coupled with the paper-reading regime as used at Helsinki, such international meetings do not really accomplish what they should. Some people would disagree with all this and maintain that personal contact is the real idea behind such gatherings. I cannot refute this point except to say that personal contact can still be established if a symposium is run on the basis of discussions held upon papers pre-distributed and read by each participant, instead of papers read at the meetings themselves.

Personal contact is certainly desirable. In this regard, the Helsinki meetings were valuable. They showed the Finns to be gracious and hospitable hosts. My remarks about the Symposium itself are not directed in any way towards my Finnish colleagues, for I doubt that they were given much say in how the meetings were to be run.

My final summing up must point out the disappointing conclusion of the meetings. Such a final session needed desperately a Ken Hare or a Trevor Lloyd for drawing together the significance of what had been said for five days. Future problems could have been outlined, promising lines of research drawn clear. The session could have provided perspective, encouragement, and impetus to younger scholars to get at the heart of crucial and little-explored corners of each discipline. I had great hopes for the final day when I learned that the distinguished Swedish geographer Hans W: son Ahlmann had been given the task of summing up, based on briefs presented by each session chairman. By some quirk or mistake, Ahlmann never had a chance. The discussions and final summation were poorer without him.

After the final session things began to pick up a bit. A gala banquet was held in the King's Hall of Turku Castle on Saturday evening. The next day a chartered plane carried the group north to Ivalo, in Finnish Lapland, and a bus on from there to Kevo and Utsjoki, but that is the subject of my next letter.

Sincerely,

Bill Mattay

W. G. Mattox

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