about generational differences, but stress the differences by gender and region (especially between Baker Lake and Cape Dorset). Moreover, he finds that at Baker Lake the work of both men and women evidences great similarity, whereas at Cape Dorset gender differences are readily apparent. He points out that not all difference in the work of men and women can be accounted for by cultural inter-community differences and suggests that other factors must be examined if we are to understand the phenomenon. For example, he suggests that lack of observed significant differences by gender may be explained by the fact that both husband and wife engaged in artistic production, or by possible different conditions in various workshops (egalitarian in one, organized by gender elsewhere, to cite one of his examples). Other gender differences may be due to the "Freudian" factors (p. 25). In terms of content, Graburn sees ". . . a strong male emphasis . . . on naturalistic reality, including culturally shared mythology" (p. 26).

Graburn uses in his analysis Inuit criteria for judging a representation, such as *quak*, which indicates a static versus dynamic image. He also defines the "Inuit aesthetic canon *sulijuk*, which may be glossed as "truth, that which really exists, reality" (p. 26) and which "does not exclude shared or even individual mythological depictions." However, the concept of *sulijuk*, according to Graburn, might require the use of certain stylistic devices: ground line, three dimensional perspective, and correct ethnographic detail" (p. 26). Graburn writes: "My prior and recent research has confirmed that *sulijuk* is the strongest single aesthetic canon for Inuit artists and non-artists both in Nouveau-Quebec where it is very much in evidence, and in Baffin Island, where it is less so." Would that art historians and museum directors paid some heed to non-Western, native, aesthetic canon and stopped judging and interpreting artistic productions of non-Westerners in our modern, contemporary ways!

In conclusion, I can only state that I fully agree with Graburn that "Research on Canadian Inuit graphic art is at an early stage." Therefore, the exhibit and the accompanying catalogue must be viewed as a pioneering effort, an experiment, and should be welcomed as such. I cannot, however, fail to express my sincere hope that in the future both the organizers of similar efforts and the interpreters of Inuit artistic activities pay more attention to social context and ethnoaesthetics and less to current art history views on what constitutes "art" and "creativity."

The book is a good introduction to Canadian Inuit graphics but it has somewhat limited utility for the specialist.

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EDUCATION, RESEARCH, INFORMATION SYSTEMS AND THE NORTH. Edited by W. PETER ADAMS. Ottawa: Association of Canadian Universities for Northern Studies Association universitaire canadienne d'Etudes nordiques, 1987. Softbound. Cdn$27.50.

This publication is a report of the ACUNS annual meeting held in Yellowknife in April 1986. This is the second annual meeting ACUNS has held in the North, and the report was considered

> as an opportunity for a "mutual briefing" between its 35 member universities and the people of the North. The idea was that Northerners would be able to express their views on what the universities are doing and what they should be doing. At the same time, the universities would have an opportunity to make Northerners aware of their work in the North and their motives for undertaking that work [p. 3].

The report is one part of ACUN's contribution to the exchange.

The report consists of 82 papers, addresses, bibliographies, profiles of the member universities of ACUNS, and lists of library services.

Following an introduction and overview, there are major sections on education, research, higher education and training, teacher education, distance education, and information systems in the North. It concludes with a guide to the 35 universities that are members of ACUNS.

The report is an interesting and invaluable document for a number of reasons. It is a rich resource on research in the North in many forms, including institutions, personnel, and information storage. As much as possible, the personnel references are very specific, sometimes including phone numbers. This value is apparent both to those in the North and outside.

The northerners will have within easy access a listing of the institutions and some indication of the kinds of studies in each. Universities will be networking both among themselves and with the northern people, thus providing more complete and immediate means of sharing ideas and extending the information in any single institution.

The report will provide one of the most up-to-date resources for those from outside Canada who wish to study the North in more detail. It makes a major contribution in its provision of short reports from 14 institutions located in the North and explains and describes their understanding of their own domain. Such diverse institutions as the Metis Association of the Northwest Territories, the Northern Heritage Society, the Science Institute of the Northwest Territories, and Arctic College are among the 14.

An interesting aspect is the mix of the reports from both institutions and politicians. The politicians include the education minister from the N.W.T., the minister of Indian Affairs and Northern Development, the government House leader, Yukon, and spokespersons for the Dene, the Metis and the Inuit Tapirisat. This acknowledges that politics provides some public values base for all research and the researchers, educators, and politicians are brought together in this conference. The inclusion of a table outlining ethics in northern research is valuable.

A major issue raised and discussed by E. Bielawski is the gap between those who are researchers, academics, outsiders and those from within the culture being studied. The author raises theoretical implications for social science and concludes with an interesting hypothesis that "if we accept the broad evolutionary concept that generality is more adaptively successful than specifically, we might consider incorporating the richness of cross-cultural perceptions in the advancement of science" (p. 61).

Another major issue, but raised from the perspective of the people in the North, is the relative isolation of the southern researcher and the northern people. Some strong points are made by northerners on this issue, and the sounds have a long echo. Many of the northern papers not only present the general case but give examples as to how this gap can be lessened. For instance, in teacher education suggestions are made for research into learning style and curriculum adaptations. There is an open invitation to help.

Both of these issues are important material for anyone contemplating carrying out research in the North, but they are also fascinating for the challenge they provide.

The publication might have included an index as well as a table of contents, but with this small exception, I consider it an excellent document for anyone inside or outside the North who wishes to have a comprehensive resource and a start on some of the related issues.

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ESTIMATING MOOSE POPULATION PARAMETERS FROM AERIAL SURVEYS. By WILLIAM C. GASAWAY, STEPHEN D. DUBOIS, DANIEL J. REED, and SAMUEL J. HARBO. Fairbanks: Institute of Arctic Biology, University of Alaska, 1986. Biological Papers of the University of Alaska, No. 22. ix + 89 p., appendices. Softbound. Free; US$3 for postage and packing.

The aim of this handbook is to provide an instruction manual for the conduct of aerial surveys for moose in the open Boreal forest, and to

this end the authors' experience in survey work is distilled into a step-by-step handbook that is thorough, detailed and carefully compiled. This is not, and is not meant to be, for the general biologist, however interested in moose; it is meant for the survey specialist.

Field methods are described down to the inclusion of completed field sheets, advice on the scale of map to choose, and cautionary words on the importance of controlling field travel costs. One aspect treated less thoroughly than its importance warrants is the choice of aircraft and pilot. It is implied that pilots should have survey experience, and that aircraft should be slow and maneuverable, but requirements are not given in detail. The survey procedures combine robust and practical field methods with refined mathematical methods for survey design and data analysis, for which there are worked examples for every step. This is not for those shy of formulas; it's packed with them. Part of the reason for this is that there is a lot of repetition; for example, Satterthwaite's approximation for the degrees of freedom of combined variances is never given as a general expression, but occurs in various special forms nine times (and then is missing, where it would be an improvement, from Sec. 3.7.3 — Calculating the Expanded Population Estimate).

The aerial survey design advocated — or, rather, prescribed — is complex, requiring three survey stages, each subsequent one refining previous estimates. After the study area is divided into sample units, at a recommended size of 11-13 sq. mi. each, an initial survey of the entire study area is flown to estimate the density in each sample unit only well enough to assign it to a "high," "medium," or "low" density class. (Rules are given for deciding when sample units can safely be assigned to classes without being flown over.) A random sample of the units in each class is then flown in the "standard" survey to estimate a standard mean density for each class; and of those, some (or all) are chosen for a further sub-sampling of a 2-sq.-mi. plot for intensive search to estimate a sightability correction factor for the standard survey. (And then a fine factor may have to be obtained from a radio-collaring experiment to correct the intensive searches.)

The mathematical methods are generally sound, well constructed, and robust. The importance of efficient design and careful analysis is recognized, and the calculation and combination of sampling standard errors is given for each step. Included are: estimation of the visible population in each density class and combining them to the total; the calculation, and correction for small-sample bias, of the sightability correction factor; its use to expand the population estimate; optimal allocation of survey effort between strata and between standard and intensive searches; the detection and estimation of changes in population size; and, usefully, the design of surveys to do so, considering both Type I and Type II errors. A final section shows how to estimate sex and age ratios. The reader is warned against most of the likely temptations to depart from random sampling, but an exception is the suggestion (on p. 19) that, as long as sample units are searched in the random order in which they are selected, "the survey can be terminated whenever adequate precision of the population estimate is attained." Such a decision rule biases sampling in favour of small variances and produces too-narrow confidence intervals; if sample mean and variance are correlated, as in such studies they probably are, population estimates will also be biased. Statistically valid sequential sampling schemes do exist, but they're more complex than this.

In some aspects, the presentation is fussy: four levels of numbered heading are oppressive (though equations are not numbered), and the examples of worked calculations and completed field sheets are a continual hindrance to the flow of the material: if they were collected in an appendix, they would themselves cohere and flow as a counterpart to the text. Anyone using this as an instruction manual will want to keep it for reference and will then find the worked examples in the way. This tries to be a stand-alone self-contained volume, including, unnecessarily, an introduction to simple sampling theory, tables of random numbers and (twice) of "Student" 's t, and explanations of Type I and II errors, the power of tests, and the difference between linear and exponential growth of populations. The authors would have done better to assume adequate understanding of statistical and mathematical concepts — as it is they give little explanation of stratified sampling, of ratio estimation, or of the term "bias." Programs, instructions, and example outputs for calculating results on an H-P 97 take up 11 pages of the book and 5 more of an appendix, although this model hasn't been in the H-P catalogue since 1984.

At the beginning of the introduction, the authors make it plain that their object is to set out, with no qualifications, no consideration of alternatives, the methods that they have found best. The result is a recital of "This is how we do moose surveys; follow these methods exactly, and you will have a good survey." True; but as such, it is narrowly aimed at people who are looking for such a set of instructions to follow. This is a small market; and most such readers would welcome more discussion of the options available, so that if forced to deviate, they could do so informedly. Many other readers — those with more general interests in wildlife surveys, who work with other species, in other habitats, with other survey designs and sampling schemes — will find this exposition interesting, but will regret that the authors do not reveal more of the experiences and decisions that went into developing their methods.

That this book is popular is shown by its already having been reprinted. It deserves to be popular not because of its detailed instruction on field techniques and cost management, nor because of the worked examples and HP-97 programs, but because it gives a complete set of design procedures and analytical routines for the mathematical aspects of stratified random aerial survey. Few survey biologists may need them all — but nearly every survey biologist will need some of them.

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THE ARCTIC WORLD. Edited by WILLIAM E. TAYLOR, JR.; principal writer, FRED BRUEMMER. Toronto: Key Porter Books Limited, 1985. 256 p., 130 colour photos, 100 black and white photos, 1 map.

In his editorial foreword, W.E. Taylor, Jr., points out that southerners commonly regard the Arctic as remote, hostile and barren, whereas, he contends, though all these things, it is also profoundly beautiful, abounding in fascinating wildlife, and from a cultural point of view a place of long history and humanity. All the pictures and illustrations bear witness to this theme.

This is a large-sized volume with some 256 pages of high quality paper, about two-thirds of which are devoted to pictures, mainly colour photographs. Also reproduced are a number of archival photographs and prints. A text is pitched to present a serious but easy-to-read adjunct to the illustrative matter. One can readily imagine that a picture-only browser will finish up having taken in most of the text as well, gleaning in the process a fascinating insight into the circumpolar region.

A broad description of the geography and general environment, particularly wildlife, is provided. Also it embraces a history of man's penetration of these regions right up to the present day, beginning with Stone Age man's move northward into the Russo-Siberian Arctic and eventually crossing over the Bering Straits into what is now the Canadian Archipelago.

Augmenting the general survey is an examination in greater detail of certain of its aspects. Thor Larsen describes the fauna and Frans Wielgolaski the flora, both offering explanations of the various biological mechanisms that have allowed the different species to adapt successfully in the frigid climate. Turning to the human population, Robert McGhee traces the anthropological history of the races and tribes that have made their homes around the Arctic Circle. A.F. Treshnikov tells of the polar exploration that has taken place since the 11th century and particularly the scientific missions of the past 200 years. Finally, Ernest