ASTIS CURRENT AWARENESS BULLETIN, bi-monthly, $65.00 per year, and ASTIS BIBLIOGRAPHY, annual, $65.00. Compiled by Arctic Science and Technology Information System, The Arctic Institute of North America, Calgary.

It is now six years since the sixteenth and last volume of *Arctic Bibliography* (Martna, 1975) was published. That magnificent series, the product of the creativity and energy of editors Marie Tremaine and Maret Martna and scores of devoted bibliographers, was published over a period of almost thirty years. For a variety of reasons, production of Volume 16 was delayed so that its coverage ended some years before publication date.

The scope of *Arctic Bibliography (AB)* was tremendous in terms of subject matter. It spanned, more or less effectively, virtually the entire cold region literature of the northern hemisphere. Geographically, it focused on a definition of "arctic" which encompassed most definitions of "arctic" *and* "subarctic" (except Iceland), with additional non-regional literature from Antarctica and the alpine regions. In publishing over 100 000 abstracts between 1947 and 1975, the *AB* dipped into the literature of more than 40 languages ranging from Bulgarian to Zyryan and from Tungu to Lapp with a strong emphasis on the Russian literature. Volume 15, published in 1971 (Martna, 1971), is a typical example, containing more than 8000 abstracts from 37 languages and from hundreds of journals and many hundreds of books. More than half of the abstracts in this particular volume, which focused on the years 1966-67, were from the Russian.

Most abstracts were written specifically for *AB*, and in virtually all cases the abstracts were carefully checked by the bibliographers or were specifically translated. Each volume had an index which could be entered by subject and geographic location.

The *AB* was one of the major contributions of The Arctic Institute of North America to the study of the North. Since *AB* 's demise we have been thrown back on a number of bibliographic programs and information systems offered by other agencies, some of which co-existed with *AB* — such as SPRI, *Recent Polar Literature* (e.g. SPRI, 1979), and *Antarctic Bibliography* (e.g. Thuronyi, 1978); and some which have developed since the demise of *AB*, such as the superb *Yukon Bibliography* (e.g. Cooke and Singh, 1980). It is not being disrespectful to say that none of these has attempted to match *AB* in terms of comprehensiveness. Often these other systems have strong regional or disciplinary guidelines and strong language preferences.

For those of us who still think of a "bibliography" as a type of book which helps us to cope with the rising flood of information in our various fields of interest, somewhat as a dictionary helps cope with the dynamic vocabulary of our fellow human beings, it is difficult to think of a volume of annotated, indexed, abstracts as part of an "information system". Yet *AB*, like any of the book-form bibliographies, was always just that. The *AB* staff had a highly sophisticated method of collecting information ("establishing a database" is the current jargon), sorting it and presenting it to readers ("customers") in an easily usable form. Once the database was in place (a volume published?), it was (and is) possible for it to be used in various ways — to sort out work by region or topic, for example. In fact, the volumes of *AB* were successfully mined by AINA staff and others in the production of specialist bibliographies such as the *Bibliography on Freshwater Ice* (AINA, 1969), a bibliography on arctic ophthalmology (AINA, 1973), and others.

As far as I know, the first 14 volumes of *AB* were produced entirely by hand and the final product was simply the printed page. The bibliographic staff presumably worked with index cards or typed forms, in a fashion similar to the manual operation of a librarian producing a card catalogue. Further use of the finished product of this system was also "by hand" in that people used the indexes, copying relevant material. It is again appropriate to draw attention to the dictionary analogy — printed dictionaries were, I assume, usually produced and used in this fashion.

The technology is now available to automate a bibliographic database so that it can be manipulated by machine. Once in place, such a database can be used to produce printed bibliographies — the *Antarctic Bibliography* (Thuronyi, 1978 etc.) is a classic example of this as are the myriad of discipline-based "abstracting services" which now exist. One of the reasons for the delay in the publication of Volume 16 of *AB* was the fact that the staff were engaged in completing the conversion of their system, begun for Volume 15, to an automatic process. When using the printed product of an automated database, the reader is often made more conscious of the fact that he is using an "information system", if only because the hard copy version often looks as though it has been produced by a teleprinter (in contrast to the variety of scripts, etc. which were used in printing *AB*). However, the automated bibliographic database need *not* be used to produce books — it can be used directly — you can ask the computer to search the database for you, giving it appropriate criteria. Today many information systems are simply of this type — in theory, at least, the user can read an abstract of a recent paper as soon as it is inserted in the base, rather than waiting months or years for a published printed version of it in a bibliography.

In principle, however, the process of retrieving information is the same in the case of the *AB* or the new automated systems; and in the end, the value of the information depends on the quality of the inputs, creativity in the design and operation of the system, and the creativity of the user of the system.

This rambling introduction was designed to entice those who subscribed to *AB* while it was being published and those who still use volumes of it in libraries today, and who are not familiar with or attracted by (even repelled by) existing arctic information systems, to consider ASTIS (Arctic Science and Technology Information System). While most of us recognize the particular difficulty and need for keeping up with interdisciplinary developments in our sphere of interest, "the Arctic", too few of us have come to terms with the advantages (and disadvantages) of automated means of handling such information.

ASTIS is AINA's attempt to replace *AB* with a new arctic information system. Although opinions on how such an information system should be designed vary, very few informed persons would disagree with the premise that there is a crying need for a sophisticated, flexible information system focused on the north. Those of us who are interested in the Arctic almost inevitably have interdisciplinary or, at least, multidisciplinary interests which are poorly catered to by the disciplinary-based abstracting services.

With apologies to the initiated, let me try to explain what ASTIS is. It is an automated collection of abstracts, now totalling about 7000, accumulated at a rate of 2400 per year. This collection is the system's database. *Services* which ASTIS offers include on-line searching of the base (do-it-yourself), and the production of specialized printed bibliographies (products of custom-made searches by staff).

There are two principal printed *products* of the system — bi-monthly books of abstracts ("current awareness bulletins"), and annual bibliographies which include the entire contents of the database with indexes by subject, geographic location, author, source of reference, and so on.

I will not comment here on the *services*, save to say that there is a well-produced manual for those who wish to search the database themselves and that it is possible to conduct searches from such places as Japan and France, as well as from locations in North America. It should be possible to add material from data banks assembled by other organizations to this base fairly easily.

Each *Current Awareness Bulletin* contains about 400 abstracts, set out under 24 broad subject headings with a geographical index and an author index. The location of the document cited is indicated in each case.

The contents of the *Bulletins* are accumulated to form the annual *ASTIS Bibliography* which is produced on microfiche. This, I suppose, in the narrow sense, is the successor to *Arctic Bibliography*. The miniaturization involved in the microfiche process is such that it is possible, each year, to subsume the entire contents of the ASTIS database in a single *Bibliography*; thus it is not necessary to search back through previous editions as was the case with *AB*. The entire output of the system to date, three years of abstracts and indexes, on microfiche, occupies only the equivalent of a few pages of a normal-sized ring binder.

The scope of the automated system upon which the annual *Bibliography* is based is indicated by the sophisticated indexes which are provided. The *Bibliography* can be searched through fully cumulative author and geographic indexes, a title index (also providing access by journal title) and broad or specific subject indexes. There is a total of six indexes, with each citation appearing in the indexes an average of 15 times.

It is not really appropriate to compare the annual *ASTIS Bibliography* and *AB* as their scope and intent are so different. In contrast to the enormous coverage of *AB*, the literature covered in ASTIS is virtually entirely in English, drawn from a relatively small number of journals and other sources. The abstracts published in the *ASTIS Bibliography* are mainly author abstracts.

The most striking feature of an *ASTIS Bibliography* in comparison with a volume of *AB* is its currency. While *AB* was, at best, several years behind the literature, *ASTIS* presents the reader with material which is less than a

year old. The bi-monthly *ASTIS Bulletins* are, of course, even more current. The published products of ASTIS are similar in this respect to *Antarctic Bibliography*, which publishes bi-annual volumes based on monthly bulletins. The ASTIS annual total of 2400+ abstracts is similar to the bi-annual total of *Antarctic Bibliography*.. However, one volume of *Antarctic Bibliography* is four cm thick — three years' output of fully cumulative ASTIS output covers a relatively few square centimetres of microfiche.

Although microfiche reading equipment is now available in all major libraries, the microfiche format of the *ASTIS Bibliography* still represents something of a deterrent to many who would benefit greatly from ASTIS. However, coping with the rising torrent of northern information is now more expensive even than it was when *AB* was struggling to survive financially. The almost 5000 pages of the 1980 edition of *ASTIS Bibliography* are contained on only 27 microfiche which are each the size of a large index card. The savings which this represents in terms of producing an equivalent volume or volumes are clearly enormous.

There has never been a greater need for a Canada-based arctic information system. Activity in the Canadian north is at an all-time high and is increasing, and published material about the north appears to be increasing at a rate which is disproportionate to the rate of increase in activity. Many northern problems require a multi-disciplinary perspective. Any information system which attempts to deal comprehensively with the north today *must* be automated, it must be flexible in design to cater to the varied and changing needs of the diverse interests of those interested in the north, and it must, to survive, be economical. It may be that ASTIS has the capability of forming a substantial part of the foundation of a major hemisphere information system which will, in the modern world, prove a worthy successor to *Arctic Bibliography*.

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ARCTIC ANIMAL ECOLOGY. By H. REMMERT. Berlin, Heidelberg, New York: Springer-Verlag. 1980. 280 p., 157 illus., 28 tables, bibliography, index. Paperbound, $24.80.

For years, results of high latitude research appeared in widely scattered, separate articles often in specialized journals. Helpful collations were rare. In 1966 a fairy godmother, IBP-PT, appeared and blessed the Tundra Biome with co-ordinated enthusiasm and increased funding. The years 1972-74 were scheduled as Phase III: Synthesis and transfers. National and international synthesis volumes on the Arctic were to be produced. They were, but behind schedule and lacking some of the integration initially envisaged. Three years was insufficient time for effective synthesis.

In his preface to *Arctic Animal Ecology*, July 1980, Prof. Remmert noted "A large number of comprehensive publications has been devoted to the Antarctic. . . Nothing comparable is available for the Arctic." He continued, reporting that *Arctic Animal Ecology* evolved from an attempt to synthesize 15 years of ecological and physiological research work in the Arctic (mostly at Spitsbergen) and to compare the findings with other arctic regions. I thus read *Arctic Animal Ecology* with interest. First, Spitsbergen is a fascinating place. Second, Remmert was obviously aware of the synthesis volumes of the IBP Tundra Biome (he cites 12 of them), and was apparently going to do a better job (because nothing was available for the Arctic). Third, I had shared in the agony and the infamy of several IBP Tundra Biome volumes and had some misgivings about the amount of time they had taken. Perhaps one author could create a more consistent synthesis than the 32 of *An Arctic Ecosystem: The Coastal Tundra at Barrow, Alaska* (Brown *et al.* (eds.), 1980, Stroudsburg, Pa: Dowden, Hutchinson and Ross), or the 50 of *Tundra Ecosystems: A Comparative Analysis* (Bliss *et al.* (eds.), 1980, London, New York: Cambridge University Press). Shared conventional wisdoms of IBP-PT might be challenged. A different body of literature might be incorporated; I was particularly interested to see how the circumpolar literature would be integrated. Perhaps a myth shrouding some of our worst climates would be penetrated. Remmert's book met these expectations, but in an unanticipated fashion.

Consider first the literature. My quick count yielded 313 references cited; 221 (71%) in English, 79 (25%) in German, the remaining 13 in Norwegian, Icelandic, Swedish, Russian and Danish (descending order). For those studies where specific location might significantly influence findings, 56 were North American, 50 Norwegian (most from Svalbard or Spitsbergen), 22 from the Antarctic (despite the book's title and concern with the polar circle), 18 Finnish, six from Greenland, five from Sweden, four from Iceland, three from the Soviet Union and one from Germany (Kieler Bucht). The orientation is largely Fennoscandian (47%). Canadian Wildlife Service publications account for 19 references. For comparison, I arbitrarily chose the first three chapters dealing with animals from Bliss *et al.* (1981). These chapters (11 through 13) total 124 pages compared to the 250 of *Arctic Animal Ecology*; five more chapters dealing specifically with animals are present in Bliss *et al.* There are six authors for the three chapters, four of whom are North American. I found 334 different references; 306 (92%) in English, 19 (6%) in Russian, the remaining nine in Norwegian (6), German (2) and Danish (1). Where study area was important, studies were largely North American (197, 62%), followed by Norway (32, 18.5%). Other countries represented, in descending order, were: Soviet Union, Finland, Poland (microtine research), Sweden, Greenland and the United Kingdom (red deer). In fairness to Remmert, he noted in his preface to *Arctic Ecology* that "It is not meant as an exhaustive survey of the relevant literature." It isn't.

One can find more in these numbers than catharsis for a quantitative ecologist confronting a book review. First, few but Germans read German. Second, North Americans remain parochial in their reading. Third, multiple authorship produces a more comprehensive, if not more integrated, discussion.

Numbers themselves are objective, subjective appraisal follows. My initial expectations are the bad news, the unexpected features are the good news. Expectations: Remmert does incorporate a body of literature different from other volumes dealing with the Arctic, he confronts some conventional wisdoms, his approach is more unilateral but not necessarily more coherent than multiple-authored volumes, and he further enshrouds or perpetuates myths as often as he penetrates them. I expand this appraisal by a brief review of the volume's content and a *caveat* - I found more errors, logical and otherwise, than are presented in this review.

The volume has six parts, Part I (Introduction: Delimitation of the Arctic) begins with Remmert firmly on a hobby horse - the Arctic should be delimited by the Arctic Circle. Quixotic charges on a hobby horse can be informative to a reader, because they may penetrate an area of confusion. Remmert's six-page gallop is interesting and presents some telling points, but his steed falters — largely because of the rider. To make his point, data from McMurdo Sound, Quito, Irkutsk and Oxford are presented - the closest of these to the Arctic Circle is 14° 14′ distant. The course becomes a steeple-chase of logical and biological barriers. Remmert negotiates it by overstatement (". . . The Arctic climate is a purely seasonal one and undergoes no daily fluctuations. . ." (3); a closer reading of *Structure and Function of Tundra Ecosystems* (Rosswall and Heal (eds.), 1975, Ecol. Bull. (Stockholm) 20), which he cites, would have helped) and biological omission ("activity of poikilothermic organisms, such as the bacteria and fungi . . . is exponentially dependent upon temperature" (3); Flanagan and Scarborough in *Soil organisms and decom-*