

**ELECTRONIC PUBLICATION OF AN ARCHIVAL RESOURCE:
THE ARCTIC BIBLIOGRAPHY**

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ABSTRACT: The Arctic Bibliography (AB) is a multi-volume guide to the literature of the Arctic region through the early 1970s. AB was prepared by the Arctic Institute of North America with the support of government agencies of the U.S. and Canada. The 16 published volumes contain over 108,000 titles, with English abstracts. All subjects – science, technology, and the arts – are covered comprehensively, regardless of language of publication or document type. Each volume has its own detailed index to subject, place, and geographic feature. AB is considered difficult to use because of 1) access, since it lacks a compiled, single index, and 2) availability, since relatively few libraries are able to offer a complete 16 volume set to the user as time passes.

This paper offers a review of a new project to be carried out by the American Geological Institute, producers of GeoRef, with funding from the U.S. National Science Foundation. This project will result in an electronic version of AB, searchable on CD-ROM, Internet, or other media. The resulting electronic product will have several advantages over the printed product, assuring wide availability once again to a research community who may be overlooking the existence of prior relevant research.

The paper discusses the merits and the significance of AB as a reference tool, and attempts to convey the importance of this project for the polar information community which has been without easy access to the material contained in AB for too many years.

KEYWORDS: Arctic regions--Bibliography, Electronic data processing

INTRODUCTION

The Arctic Bibliography (AB) is a multi-volume reference work prepared for, and in cooperation with, the Department of Defense under the direction of the Arctic Institute of North America between 1953 and 1975. The first twelve volumes were published by the U.S. Government, and the final four volumes by McGill Queen's University Press in Canada. AB has been out of print for many years, and is now available only in reprint from Swets (\$1664) or on 35 mm. microfilm from UMI (approx. \$800).

The Arctic Bibliography Project, set up in 1947 as a short-term effort to "... produce a comprehensive bibliography of Arctic research publications" (Tremaine 1948), eventually resulted in 16 volumes containing 108,723 bibliographical citations with abstracts, and a comprehensive index. The first Directing Committee (see Appendix A) for the Project was chaired by Dr. H.B. Collins, Jr., of the Smithsonian Institution, and included such well-known "Arctic" names as Vilhjalmur Stefansson, Lincoln Washburn (credited in vol. 13 with having conceived the idea of AB), and Sir Hubert Wilkins. Some members of this committee are historic figures in themselves: Dr. Vilhjalmur Stefansson was a noted explorer of arctic regions and Sir Hubert Wilkins was a noted polar explorer and photographer.

"The Directing Committee and Project Staff in consultation, decided to place primary emphasis on publications giving the explorers' and scientists' own record of their work in the area of interest, results of expeditions and investigations as produced by their members; as much of the original records of arctic research and exploration as may be analyzed and indexed ..." (Tremaine 1948). The point of view taken in preparation of AB was enhanced by the diversity of the Project Staff. The director, Marie Tremaine, was a reference librarian, and the data analysts were scientists who, in many cases, had immigrated to the U.S. after World War II bringing, along with their scientific training, the benefit of multifaceted language skills.

AB was planned as part of a program of coordinated research over a very broad front, and was seen as fundamental to any productive program of Arctic research (Tremaine 1948). The Arctic Institute of North America was incorporated in both Canada and the U.S., and its board of governors included a member from Denmark as well. AB extended this international cooperation, involving all countries with interests in the Arctic. AB arose in response (Smith 1970) to the need for a comprehensive bibliography of the Arctic demonstrated by the fact that there existed only very old or incomplete bibliographies of the Arctic regions. Both the U.S. and Canadian governments were willing to support this endeavor in order to cope with the large number of publications reporting on research in the Arctic following World War II. At the beginning of the Cold War there was speculation that, in the event of a World War III, the Arctic would be the meeting ground between the

U.S.S.R. and the West. Therefore such U.S. agencies as the Dept. of Defense and other military agencies, and Canadian agencies such as the Defence Research Board, were the major financial contributors to the project. In later years other agencies of both national governments contributed.

SIGNIFICANCE OF THE ARCTIC BIBLIOGRAPHY

The Arctic Bibliography is considered to be "the best regional bibliography ever compiled" and "an outstanding example of the place of bibliography in modern scientific investigation" (Corley 1985). The decision to discontinue AB after vol. 16 was published in 1975 had nothing to do with the quality or the usefulness of the work, but rather rested on the belief that the new electronic bibliographic databases, also receiving U.S. government support, would include the information sources covered by AB. A study published in 1977 (Orr 1977) indicated that this would not be the case, but the decision regarding AB had already been taken and was not to be reversed (Arctic Bulletin 1977). Over the past twenty years, little has changed in this regard. The electronic databases, even those concerned exclusively with polar and cold regions, have all been discipline or mission oriented, and although much Arctic literature is covered there has been no substitute for AB, which is equally useful to the sciences, social sciences, and humanities.

AB has many distinguishing characteristics that make it as valuable now as it was during the time of its publication. These characteristics include: the wide scope of its coverage in terms of area, subject, time, and language, and its high quality abstracts.

1. **Area coverage.** Because research on the Arctic has historically been interdisciplinary, bibliography on the arctic has also followed this pattern. Thus all subjects are covered for a geographic region. A defined Arctic was divided into approx. 70 regions with a map showing these regions (which varied slightly over the years) included in each volume. The area defined extended from the Arctic Basin to Alaska, across Canada to Greenland, northern Scandinavia, Finland, and the U.S.S.R., ending with Komandorskiye Ostrova. Each record was indexed to at least one of the 70 regions, as well as to geographic coordinates and the names of geographic features. All geographic names in the index are in authorized form.
2. **Subject coverage.** The composition of the original directing committee shows as well as anything the breadth of subject matter AB expected to cover, starting with exploration and expedition records and proceeding to contemporary scientific investigations. There was no "mission" limiting coverage to certain disciplines; AB is comprehensive and its multidisciplinary approach brings together information pertinent to defined Arctic areas from a great diversity of subject fields. All document types were included, and each volume included a list of journals covered; these numbered over 700 by vol. 16. All records were indexed to subject and specific topic. A.C. points out

(A.C. 1968) that in vol. 3. under "Expeditions" there follows one hundred pages giving the official name and dates, as well as bibliography, for several hundred expeditions in a near "ready reference" format. Vol. 8 "carries also the first published abstracts of the British Parliamentary Papers on Arctic Expeditions, an heroic compilation from the 'Arctic Blue Books' by Dr. Andrew Taylor that lays open to easy use a hitherto un-indexed wilderness of primary sources of the greatest geographical and historical importance." (A.C. 1968)

3. **Time period covered.** AB provides scholars with access to the literature of the Arctic regions from 1800 up until collection of materials for AB stopped in approximately 1972. The first three volumes chiefly cover the years 1800-1950. These volumes are "the best guide to the literature of northern exploration and development during the nineteenth and the first half of the twentieth centuries" (A.C. 1968). Later volumes, while concentrating on current literature, also included retrospective coverage.
4. **Foreign language coverage.** References from foreign language materials bring the culture beyond the English speaking world to the desk top of the interested user in any country. The art, archaeology, and literature of indigenous peoples is covered extensively. Documents published in foreign languages comprise a significant proportion of AB; less than 50% of documents abstracted were originally published in English. The major foreign languages covered were Russian, German, and the Scandinavian languages. However, there was a significant proportion of "other" languages covered, as high as 19% in vol. 8 (A.C. 1968). All foreign titles were included, and an English translation of the title provided; abstracts were in English only.
5. **Abstracts.** Abstracts were written by subject specialists in various fields who commanded a wide range of languages. In every case these specialists consulted the original publication. The location of this publication is indicated at the end of every entry. For many users, the comprehensive English abstracts provide adequate information in place of the original document which either may not be generally available, or in a language not understood by the user.

ACCESS TO, AND AVAILABILITY OF, THE ARCTIC BIBLIOGRAPHY

The problem that this project is designed to address is limitations on access to Arctic research literature, caused by lack of awareness of and access to AB.

Access to AB is severely limited in terms of its index, and its availability to the potential user. Young Arctic researchers are completing theses without knowing of the existence of AB, which could mean that funding agencies and performing groups are repeating work already done in the past, or at the very least are basing current work on a false assumption

as to work already completed in the field of interest. Even those aware of its existence are unwilling or unable to make the effort to locate these volumes and use the index provided.

1. **The Index.** As indicated in the preceding sections, indexing for AB was elaborate and exceptional in terms of information provided. The index was in a single alphabet, with subheadings and cross references. It typically occupied well over 25% of the total number of pages in each volume, even printed in a reduced type size. Vol. 3 is entirely index for vols. 1 & 2. The contents of the printed volumes, averaging over six thousand records each, are accessible only by skilled use of this high quality if somewhat complex index. Unfortunately, no cumulative index for the sixteen volumes has ever been prepared. "...as the volumes of Arctic Bibliography pile up and the use made of them is increasingly retrospective, it becomes ever more time consuming to leaf through the index to each volume" (A.C. 1968, after 13 vols. had been published).
2. **Availability of AB.** Before one even deals with the problems of using the indexes to AB, one must first locate a complete set of 16 volumes. This in itself is becoming increasingly problematical as shown by a search of the two polar regions CD-ROM databases. PolarPac (WLN), which contains the holdings of over 50 polar regions libraries from several countries, revealed only 17 complete sets in 7 different countries; a search on Arctic & Antarctic Regions (NISC) added three more. This number probably under-represents the true case since AB was a government document (for 12 volumes), and a reference work, while being issued serially. Government documents and reference works may not be included by all libraries contributing records to the polar regions CD-ROMs. Searching outside of the polar regions databases was not very rewarding, although several large public libraries (New York, Chicago, Denver) do hold complete sets. However, the MELVYL library system (catalog for the University of California and California State libraries), shows only 3 libraries with holdings, all incomplete. This was also true for the University of Colorado which has only 13 volumes.

It is apparent that the sheer act of physically locating a complete set of AB is difficult to impossible for the user outside of a specialist institution. As mentioned in the Introduction, AB has been out of print for many years, and is now available only in reprint or on microfilm at a very high cost.

WHY THE ARCTIC BIBLIOGRAPHY SHOULD BE MADE AVAILABLE ELECTRONICALLY

"By not being digital you are prevented from informing today and tomorrow with yesterday" ([Taylor] 1997). Even when a set of AB is located, the daunting task of looking at 14 (v.3 is the index to v. 1 & 2) different and differing indexes (they changed to

accommodate new directions over the years) is discouraging to those users now accustomed to quick access, perhaps even from a home computer or at least on a LAN.

The advantages of having AB available electronically are:

1. **AB material is not available elsewhere electronically.** Although one of the reasons why AB lost U.S. government funding was the notion that the growing number of electronic databases becoming available during the 1970s would cover the same ground as AB had, this was shown not to be the case (Orr 1977). In fact, very little of the material covered by AB has been indexed by electronic databases, although had AB continued there might have been an increasing amount of overlap. Electronic bibliographic databases such as Chemical Abstracts, Biosis, and GeoRef, only became available during the 1970s at about the same time as AB ceased collecting material, and retrospective indexing for the electronic databases did not have as high a priority as did computer generated materials. The small amount of overlap with other indexing services becomes insignificant when one realizes that AB provides extensive abstracts for materials only indexed (and not abstracted) by other services such as GeoRef.
2. **AB's index is not adequate to access material within.** In spite of the many good qualities of the AB index, there is no way that any student or researcher can be expected to plough through a sequential index several thousand pages long. A computer generated index to an AB in digital form is crucial to provide random searching capabilities.

By making AB available electronically, both of these issues are addressed.

CONSTRUCTION OF THE ARCTIC BIBLIOGRAPHY DATABASE BY THE AMERICAN GEOLOGICAL INSTITUTE

The American Geological Institute (AGI) plans to construct the database from AB in the format which it uses for its GeoRef database, adapting existing programs to the parsing of AB. AGI's GeoRef database uses the fields specified in the UNISIST Reference Manual for Machine-Readable Bibliographic Descriptions. The Reference Manual is an international standard for exchange of bibliographic databases, and includes provision for all fields needed. In addition, GeoRef is available in the USMARC format, which is maintained and supported by the MARC Standards Office at the Library of Congress, and widely used in libraries throughout the United States. There would be a USMARC version of AB in addition to the simpler ASCII format used for GeoRef.

AGI has substantial experience with converting printed bibliographies into electronic databases and will bring this experience to the conversion of AB.

Since 1969, the AGI has produced the GeoRef database and the printed Bibliography and Index of Geology through constant monitoring of the current geological publications. This is an ongoing, daily process that involves checking the collection of the U. S. Geological Survey library system as well as other science libraries in the Washington, DC area. While this process works fairly well for current material, a need has been recognized for data from foreign and retrospective sources. To deal with the retrospective sources AGI has engaged in various data capture operations through the years.

AGI's first major effort in this direction involved digitizing the Bibliography of North American Geology, 1785-1967, published by the U. S. Geological Survey and the Bibliography and Index of Geology Exclusive of North America, 1933-1965, published by the Geological Society of America. These two major bibliographies contained 288,000 references and were digitized over a period of five years. This project was a tremendous learning experience. The main lesson acquired from this project was, (no surprise), that work done manually does not turn out to be as consistent as one wishes it could be. Assumptions required for parsing the data into its separate fields had to be based on data such as punctuation and style that are subject to human error and creativity. To compensate for this, a very flexible testing system for checking data within fields had to be developed. Based on this experience, AGI has continued to develop processes to ease data capture and conversion. In addition to conversion of major retrospective bibliographies, including most recently, the Abstracts of Chinese Geological Literature, AGI has developed relationships with more than 30 national and international organizations that are producing bibliographic information in the geosciences. All of the data provided by these sources undergo rigid automated review for conformity to acceptable standards for bibliographic information. AB fits very well into AGI's program of filling in gaps in retrospective coverage of the geoscience literature. Approximately 30 to 35% of the records are directly relevant to the geosciences. All of the procedures for this type of data capture and conversion are in place and AGI's staff is practiced in parsing data for field consistency. Data capture will be accomplished by a system of double-keying. Variances from the double-keying are checked and corrected. This process results in 99.995% accuracy and eliminates the need for extensive copy editing. During the keying process several steps are taken to make future processing easier. First, tags for fields that are easily identified are inserted into the data stream. Symbols denoting diacriticals and mathematical symbols are employed to allow the various languages represented in the original to be reproduced.

One characteristic of AB that became quickly apparent was the use of two different transliteration schemes for the Cyrillic alphabet. To be retrievable in an electronic environment, these differences must be eliminated. During keying, tags indicating the Russian ia or ya will be inserted to allow systematic changes later. One marvelous feature of AB is the extremely consistent handling of style for serials. Serials represent as much as 85% of the references and were handled in fairly consistent formats for almost all volumes

of AB. The result is easy handling by the various parsing programs. Non-serials are a different matter and will require some creative processing and heavy editing.

AGI will attempt to maintain as much connection between the original and the final product as may be useful. The original reference numbers will be maintained and library holdings will be reflected where given. Some fields will be enhanced. Serial titles will be assigned an ISSN where one exists. A language identification algorithm will determine text languages where possible making this a searchable field. The area of most enhancement will be the indexing. The subject indexing will be supplemented using the GeoRef Thesaurus. Within the GeoRef Thesaurus, automatic structures allow the addition of geographic data and hierarchical information for most geologic ages, rock types, minerals, and fossils. An example of geographic enhancement might be Adak Island. The GeoRef Thesaurus will add Aleutian Islands, Southwestern Alaska, Alaska, and United States as potential searchable index terms allowing retrieval at both the most specific level and at the broadest level. For geographic areas that have changed names through the years, AGI is contemplating additions of both current and former forms of the names.

DISSEMINATION OF THE ARCTIC BIBLIOGRAPHY DATABASE

The final product of the project will be an electronic database consisting of the references, abstracts and indexing contained in AB. Availability of AB electronically will have all of the advantages of great versatility, especially in regard to options for retrieval, since the user can combine searches for author, title, keyword in text, date, source, etc. The time savings, and the sophistication of current software, will enhance the value of this product over the printed form.

An electronic version of AB will make a wonderful complement to other related databases already included on CD-ROM, such as both of the polar regions CDs, and also to selected disciplinary databases which are lacking those materials in their subject areas.

APPENDIX A

FIRST DIRECTING COMMITTEE OF THE ARCTIC BIBLIOGRAPHY PROJECT

Dr. Henry B. Collins, Jr., Smithsonian Institution, Chairman

Dr. Burton W. Adkinson, Chief of the Maps Division, now Director, Reference Department, Library of Congress

Dr. Richard Foster Flint, Professor of Geology, Yale University

Mr. Robert C. Gooch, Chief of General Reference and Bibliography Division, now Assistant Director, Reference Department, Library of Congress

Representative, Department of the Army and Department of the Air Force
Representative, Office of Naval Research, Department of the Navy

Dr. Vilhjalmur Stefansson, New York, N.Y.

Dr. A.L. Washburn, Arctic institute of North America, Washington, D.C.

Sir Hubert Wilkins, Washington, D.C.

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