

## NEWSLETTER

No. 20      October 1972

1972 GIS ANNUAL MEETING in MINNEAPOLIS, Minn.

The 7th Annual Meeting of the Geoscience Information Society will be held 13 November 1972 at the Minneapolis Convention Center in Minneapolis, Minn., in conjunction with the meetings of the Geological Society of America (GSA) and its Associated Societies, 13-15 November 1972.

The GIS Technical Session is scheduled for Monday, November 13, from 8:30 a.m. to 11:25 a.m., in the Diamond Room of the Minneapolis Convention Center. GIS Vice President Hartley K. Phinney, jr. (Chevron Oil Field Research Company, La Habra, Calif.) has organized a session consisting of 5 invited and 2 contributed papers. See pages 12-13 of this newsletter for a list of the speakers and the abstracts of their papers. The moderator will be GIS President Roy W. Graves (Univ of Tulsa, Tulsa, Okla.).

The GIS Annual Business Luncheon will be held Monday, November 13, from noon to 4:00 p.m., in Room 9 of Holiday Inn-Central, 1313 Nicollet Ave (two blocks from the convention center). Cost: \$4.75, payable at the time of registration.

The GIS Field Trip will be held Tuesday, November 14, from 9:00 a.m. to 5:00 p.m. Sue Alexander, geology librarian at the Univ of Minnesota, has organized the excursion, assisted by Sara Aull (Univ of Houston) and Vera Bacon (Univ of Iowa). The field trip will make stops at the Museum of Science in St. Paul, the O. Meredith Wilson Library and the Winchell Library of Geology at the Univ of Minnesota, and the 3M Library in St. Paul. Cost is undetermined at this time. There will be a field-trip sign-up sheet in the GSA registration area.

Mark W. Pangborn, jr. (U.S. Geological Survey, Washington, D.C.) is arranging for the GIS booth (no.49) in the exhibits area. The exhibit display will be the same one that proved so successful last year.

GISers should consult the blue center insert in the August 1972 issue of Geotimes (p.25-30) regarding registration and hotel-reservation information for the GSA meetings. Duplicate forms may be obtained by writing: GSA Registration, Nolte Center for Continuing Education, Univ of Minnesota, Minneapolis, Minn. 55455.

### GIS AFFAIRS

\*\*\* The GIS Nominating Committee (Carrie W. Eagon, Harriet K. Long, and Joseph C. Carl, chairman) has prepared a slate of candidates for 1973 offices (President, Vice President, Secretary, Treasurer) and mailed ballots to all paid-up members in early October. Please mark and return your ballot promptly to J.C. Carl, Gulf Research & Development Co.,

P.O. Drawer 2038, Pittsburgh, Pa. 15230. Ballots must be received by 6 November 1972 to be valid.

\*\*\* Volume 2 of the Proceedings of the Geoscience Information Society was published September 1972 and mailed to all 1971-1972 members of GIS. The volume consists of the proceedings of the 6th Annual Meeting of GIS, held 1 November 1971 in Washington, D.C. It is entitled: Toward the development of a geoscience information system; a symposium. Copies of the 102-page volume can be obtained for \$2.50 each from the Secretary of GIS, c/o American Geological Institute, 2201 M St, N.W., Washington, D.C. 20037.

\*\*\* The American Geological Institute has approved the GIS nomination of Logan O. Cowgill, assistant manager of the U.S. Interior Dept's Water Resources Scientific Information Center, as the official GIS representative to the AGI Committee on Geoscience Information.

\*\*\* GIS, as a member society of the American Geological Institute, has ratified the proposed new constitution and bylaws of AGI.

### GEOLOGIC REFERENCE SOURCES

Ward, Dederick C., and Wheeler, Marjorie W. (1972) Geologic reference sources; a subject and regional bibliography of publications and maps in the geological sciences. With a section on geologic maps by Mark W. Pangborn, jr. Metuchen (N.J.): Scarecrow Press. 453p. \$12.50. (ISBN 0-8108-0477-8).

"The purpose of this guide is to introduce the reader to the literature of a geologic discipline or to the publications and maps which deal with the general geology of a country or region" (p. iii). This new edition is "more authoritative" than Dederick Ward's Geologic reference sources published in 1967 by the Univ of Colorado Press. It substantially updates the earlier work, stressing current reference sources (most of the items listed have been published since 1950, many in 1970) and covering publications in new areas such as lunar geology, remote sensing, mathematical geology, new global tectonics, and environmental geology.

The publications selected for this bibliographic guide range from introductory to highly technical, and serve to suggest representative texts, treatises, serials, and the more formal reference works in the various geologic disciplines. The guide is divided into 4 sections: general section, subject section, regional section, and geologic maps. There are alphabetized subject and geographic indexes.

The guide contains a short section (p.19-27) on "geological information", including a list of "selected articles on geoscience communication".

FLOOD DAMAGE: APPEALS TO GIS

Pennsylvania Topographic & Geologic Survey

Tropical storm Agnes dumped 16 inches of water on central Pennsylvania during the four days beginning 21 June 1972. Among the victims of the resulting floodwaters was the Pennsylvania Topographic and Geologic Survey. The Survey, occupying the entire ground floor and basement at its custom-designed new quarters in Harrisburg, saw the water reach 12 feet at its site, well above the groundfloor ceilings (see Geotimes, Sept 1972, v.17, no.9, p.22-23).

Arthur A. Socolow, State Geologist, writing in Geotimes (p.23), said: "In terms of totality of loss, our library of nearly 40,000 volumes suffered the worst. It was in an interior room and we could not get to it for several days. Having moved just a few weeks before, our books were still packed in a big pile of cartons. When we did get in to them we found that expansion had burst every box and we faced a massive mound of 40,000 volumes covered with dissolved glue, mud, and industrial oil. By that time most of the books were well on their way of returning to pulp".

The State Geologist is making an appeal to GIS members to help the Survey rebuild its library collection. It would be greatly appreciated if any GISer with surplus geologic books, periodicals, or maps would forward a list of them to the Pennsylvania Topographic & Geologic Survey, Harrisburg, Pa. 17102. (phone: 717/787-2169). The Survey will check off only the items it needs and make arrangements for shipment. Here is a chance for those with duplicate materials to make good use of them.

Ironically, the Survey was located in the Capitol Building from 1836 until early Spring of this year (two months before Agnes struck) when it was moved to Cameron Street, an area which suffered severe flood damage. The Capitol was not touched by the water.

South Dakota School of Mines and Technology

The flood of 9-10 June 1972 wiped out the entire periodical collection at the South Dakota School of Mines and Technology in Rapid City. GIS members who feel that their duplicate periodical material might be useful to the school are asked to contact Philip F. McCauley, Director of Devereaux Library, South Dakota School of Mines and Technology, Rapid City, S.D. 57701. Since it is easier to handle written lists rather than the actual periodicals, and since the school has problems with staffing and space, Mr. McCauley would appreciate written correspondence over any other form of communication.

LETTER to the EDITOR: MOON DATA

The Lunar Science Institute, Houston, is beginning a project which we believe will help all researchers in their continuing study of the Moon.

We will be building an information data base which will reference as much of the work done since 1950 as we can gather. To amass this material, we are appealing to those scientists and data collectors who may be willing to donate reports, reprints, photos, maps, and other media to our data base. These materials will be cataloged, indexed, and stored so that they may be readily available for use.

Materials should be sent to: Moon Literature Project, Lunar Science Institute, 3303 NASA Road 1, Houston, Texas 77058. If there are any questions, we can be reached on FTS 713/483-3436 or commercially on 713/488-5200, ext.35.

We would like to thank any contributors for their help.

Frances B. Waranius  
Librarian  
Lunar Science Institute  
Houston, Texas

GISers in the NEWS

Mrs. Amy E. Bumberg, formerly with the U.S. Public Health Service Hospital in Brighton, Mass., has been appointed reference librarian at the U.S. Geological Survey in Washington, D.C.

Robert T. Brady, exploration consultant with American Overseas Petroleum Ltd, is treasurer of the Petroleum Exploration Society of New York for 1972-1973.

Joseph C. Carl of Gulf Research & Development Co., Pittsburgh, Pa., took off for Indonesia and Australian waters, Nov 1971-Feb 1972, assigned as a geophysicist aboard the ocean-going research vessel M/S GULFREX to interpret geologic and geophysical data gathered by the computerized floating laboratory and prepare on-board exploration reports.

Howard R. Cramer of Emory Univ is president-elect of the Georgia Academy of Science.

Kathryn Cutler, geology librarian at Stanford Univ, in May 1972 completed 30 years of service at the Stanford University Libraries.

Joseph Kohut, formerly reference librarian at the U.S. Geological Survey, Washington, D.C., has been appointed associate professor and director of science/engineering library, Portland State Univ, Portland, Ore.

H. Robert Malinowsky, assistant director of libraries at Univ of Kansas, is chairman-elect of the Frontier Chapter of the American Society for Information Science.

Mary W. Scott, geolibrarian at the North Dakota Geological Survey, received her M.S. in Geology from the Univ of North Dakota in May 1972.

Harriet W. Smith, geology librarian at the Univ of Illinois, vacationed in Hawaii, New Zealand, and Aus-

tralia in August 1972. She visited the National Library of Australia at Canberra, and the libraries of the Hawaii Institute of Geophysics, the Univ of Melbourne, the University of Auckland, Victoria Univ in Wellington, N.Z., and the Univ of Canterbury in Christchurch, N.Z. Effective 1 Sept 1972, Mrs. Smith assumed the dual title of "Geology Librarian, Associate Professor of Library Administration".

#### NEW MEMBERS OF GIS

Anderton, Arla Jo: Research Librarian, Esso Production Research, Box 2189, Houston, Tex. 77001  
 Austin, Robert B.: Supervisor, Records Management and Technical Information Services, Chevron Oil Co., P.O. Box 599, Denver, Colo. 80201  
 Bostick, Neely H.: Associate Geologist, Coal Section, Illinois State Geological Survey, Urbana, Ill. 61801  
 Cargill, Jennifer: Assistant Science Librarian/ Assistant Professor, Miami Univ Libraries, Oxford, Ohio 45056  
 Eagon, Mrs. Carrie W.: Librarian, Esso Eastern Inc., P.O. Box 1415, Houston, Tex. 77001  
 Rheams, Mrs. Nola W.: Circulation Librarian, U.S. Geological Survey Library, Bldg. 25, Denver Federal Center, Denver, Colo. 80225  
 Samuels, Mrs. Linda: Assistant Science Librarian, Univ of Houston Library, Cullen Blvd, Houston, Tex. 77004  
 Sturdivant, Clarence A.: Supervisor, Technical Information Section, Marathon Oil Company Research Center, P.O. Box 269, Littleton, Colo. 80120  
 Yarbrough, Dr. Henry F.: Manager, Technical Information Services, Mobil Research and Development Corp, Field Research Laboratory, Box 900, Dallas, Tex. 75221  
 Zipp, Louise S.: Student, School of Library and Information Science, State Univ of New York at Albany, 1400 Washington Ave, Albany, N.Y. 12222

#### LITERATURE CITATIONS

(GISers indicated in UPPER CASE)

BRIGGS, LOUIS I.; BRIGGS, DARINKA Z.; and Gupta, Madhu S. (June-Aug 1971) A document analysis and retrieval system. Geoscience documentation, v.3, no.3-4, p.72-88.---Description of the system, implemented in the Laboratory of Subsurface Geology at the Univ of Michigan, based on controlled hierarchical vocabulary of terms, analysis & indexing of geologic documents, ascription of weighted values to indexing terms, and statistical construction of geologic concepts. Includes "Thesaurus for geologic document analysis and information system (DAIS)", by L.I. Briggs and D.Z. Briggs, p.76-88.

BROWNRIDGE, INA CALLOWAY, comp. (1972) Lithium-drifted germanium detectors: their fabrication and use; an annotated bibliography. New York:IFI/Plenum Data Corp. 210p. \$20.---Contains

790 references to the international literature on these semiconductor devices used for detection of nuclear radiation, esp. gamma rays.

Chakraborty, Ajoy Ranjan (June 1971) Citation characteristics of marine geology. Annals of library science and documentation, v.18, no.2, p.88-91.---Using the citations at the end of papers in the 1966-1968 volumes of Marine geology, it was found that libraries need purchase only those materials published since 1936 in order to achieve 90% coverage of the field of marine geology.

Chambre Syndicale de la Recherche et de la Production du Pétrole et du Gaz Naturel. Commission Documentation. Comité des Techniciens (1971) Thesaurus pétrole - exploration, production. Paris: Editions Technip. 209p. 106FF.

CORBETT, LINDSAY (Feb 1972) Problems in using external information services--attitudes of the special library and its users. Aslib proceedings, v.24, no.2, p.96-110.---Paper presented at the 45<sup>th</sup> Aslib Annual Conference, Darmstadt, West Germany, 10-14 Oct 1971.

CORBETT, LINDSAY, and German, Janice (Jan 1972) AMCOS Project Stage 2: a computer aided integrated system using BNB MARC literature tapes. Program, v.6, no.1, p.1-35.

Cutbill, J.L. (June 1971) Cambridge research on data processing in geology. Reports 1-6 (bound in one volume). Cambridge (Eng.): Univ of Cambridge, Dept of Geology. (OSTI report 5109; held by the National Lending Library for Science and Technology).

Descamps, J.L. (1971) Vers un dictionnaire, contextuel: classement d'un corpus traitant de géologie. Traduction automatique informations, no.1, p.1-34. ---The Centre de Recherche et d'Étude pour la Diffusion du Français is developing a contextual dictionary for geology, whose entries are statements presented in a significant order. From the 40,000 words comprising the texts to be classified, 1500 headings were selected, beneath which contexts both of individual words and of families of words were classified.

Fendrych, M., and Fogl, J. (1971) Vývoj a současný stav počítačového informačního systému ASTI. Československá informatika, no.6, p.10-15.---ASTI is an automatic information system at the Institute of Engineering Geology in Brno, Czechoslovakia. Describes the set of programs and subprograms composed for the DATA SAAB D21 or D22 computer. ASTI will serve as a basis for the construction of a universal building-block system of expandable software for the progressive institution of the Czech VTEI automated network as part of the project of the state information policy for 1971-1975.

Germeraad, J.H., and others (June 1972) A computer-based registration system for geological collections. Scripta geologica, 9. 12p.---Description of the new system at the National Museum of Geology and Mineralogy, Leiden, The Netherlands.

- Haman, Jon F. (Sept 1972) Personal communications. Geotimes, v.17, no.9, p.10-12.---Suggests a new convention for personal-communication references that would include biographic information and current address.
- HUTCHISON, V. VERN (1972) Selected list of Bureau of Mines publications on petroleum and natural gas, 1961-70; supplement to Information circular 8240. U.S. Bureau of Mines. Information circular 8534. 163p.---Contains 829 entries, with 3 indexes (author with short title, detailed subject, and report number). Supplement to 1964 publication listing USBM publications on petroleum and natural gas, 1910-1962.
- Indian National Scientific Documentation Centre (1969?) Union catalogue of serials in the Geological Survey of India libraries. Delhi: INSDOC. 536p. (Its Union catalogue series, 11).---Arranged by title, with sponsor & subject indexes. Covers holdings of 168 libraries; number of titles is nearly 12,000.
- International Federation for Documentation (1970) Universal Decimal Classification UDC; special-subject tables for geology, surveying, cartography and related branches of science and engineering. Jerusalem: Israel Program for Scientific Translations. 323p. (Its Publication no.431). ---English version based on Russian original.
- Karunakaran, C., and Siddiquie, H.N. (1971) An edge notched card system for marine geological data. Geological Society of India. Journal, v.12, no.1, p.34-42.---Describes system in which "97 different data can be coded on a single card".
- King, D.W. (Nov 1971) A digital processing system for seismic array data. Australian computer journal, v.3, no.4, p.178-181.---Discusses in detail "the development of software to implement a digital processing method in which seismometer channels are summed, after steering delays have been inserted to allow for the arrival of energy at nonvertical incidence".
- Laffitte, P. (Feb 1971) Semantic coding in geological data processing. Geoscience documentation, v.3, no.1, p.6-9.---Description of a method of semantic codification of geologic concepts, relying on analysis of the "significant".
- MacKay, J.W. (1971) An introductory guide to sources of information for the literature of geology. London: University College, Dept of Geology. 63p.
- MARTINSON, TOM L. (1972) Introduction to library research in geography: an instruction manual and short bibliography. Metuchen (N.J.): Scarecrow Press. 168p. \$5.---Lists major English-language reference works in geography and gives advice on how to use these works in compiling a bibliography on a geographical subject.
- MARTINSON, TOM L. (March 1972) Library of Congress author catalogs: a "microseries" in the stratified flow chart. Special Libraries Association. Geography and Map Division. Bulletin, no.87, p.12-16,50.---Describes a method of compiling subject bibliographies in geography.
- Martinsson, Anders (30 Sept 1971) Editors' associations in the earth sciences and the editor's role in the structure of research. International Union of Geological Sciences. Geological newsletter, v.1971, no.3, p.206-210.---Description of AESE (Association of Earth Science Editors) and Editerra (European Association of Earth Science Editors). Includes a discussion of "what is an editor?"
- Martinsson, Anders (1972) Editor's column: titles of palaeontological papers. Lethaia, v.5, no.1, p.126-128.---"In articles provided with an abstract ('extended title with connected sentences'), there is no reason to overcrowd the title with information of key-word character. The title should be formulated to assist the selective reader. Additional information for the needs of secondary publications should be supplemented in the abstract and in a special line of key-words for indexing. We should aim at clean titles, using bibliographic and documentalistic foresight".
- MATHEWS, WILLIAM H., III (1972) Introducing the Earth; geology, environment, and man. New York: Dodd, Mead. 210p. \$4.95.---For high school students. Discusses the origin and composition of the Earth, its position in space, and the causes of past and present changes in the Earth's surface.
- Novikova, T.Ya. (1970) Informatsionnye potrebnosti razlichnykh grupp potrebitel'ei v otraslevoi sisteme nauchno tekhnicheskoi informatsii po geologii. Nauchno-tekhnicheskaya informatsiya, series 1, no. 10, p.8-9.---An analysis of information needs of various user groups in geologic information service network. The analysis is made of primary and secondary documents according to occupation as between scientific research institutes, manufacturing, project design, and administration.
- PEARL, RICHARD M. (1972) Colorado gem trails and mineral guide. Sketch maps by Mignon Wardell Pearl. 3rd rev. ed. Chicago: Sage Books. 222p. \$5.
- Ristow, Walter W., comp. (1972) A la carte; selected papers on maps and atlases. Washington, D.C.: Library of Congress. 232p. \$4 (available from Superintendent of Documents, Washington, D.C.).---Includes papers, most of which originally appeared in the Library of Congress Quarterly journal, on (1) maps and atlases of the 16th and 17th centuries, and (2) American maps of the 17th to 19th centuries.
- SCOTT, MARY WOODS (1972) Annotated bibliography of the geology of North Dakota, 1806-1959. North Dakota. Geological Survey. Miscellaneous series no. 49. 132p. \$1.---Contains about 2000 entries, with subject/geographic index.
- Searle, R.H., and CORBETT, LINDSAY (Apr 1972) The computerized, punched card loans control system at AWRE, Aldermaston. Program, v.6, no.2, p.153-166. ---AWRE is the Atomic Weapons Research Establishment.

Swirsky, Lillian, comp. (1971) List of translations in the library of the Geological Survey of Canada, no.1. Canada. Geological Survey. Paper 70-62. 24p.---Arranged by author.

THATCHER, EDWARD P. (June 1972) Toward education in map librarianship, or Who else is seminar happy? Western Association of Map Librarians. Information bulletin, v.3, no.3, p.2-3.

Tillett, Barbara B. (Dec 1971) Ocean Science Information Center. Hawaii Library Association. HLA journal, v.28, no.2, p.25-26.---Description of OSIC, begun in 1971, and located within the Science and Technology Reference Dept of Hamilton Library at the Univ of Hawaii.

Wentzel, I., and Gralewska, A. (Apr 1972) SLIP programs in an integrated manual-machine information system: the Rock Mechanics Information Service. Program, v.6, no.2, p.101-116.

Wood, D.N., and Bower, C.A. (Oct 1971) An evaluation of some abstracting and indexing services in the earth sciences. NLL review, v.1, no.4, p.113-118.---For each of 8 subjects in the earth sciences field, a bibliography of 100 references was compiled from citations of 1964 articles at the end of at least 25 articles in 1968 issues of relevant journals. These were then sought in several years author indexes of appropriate abstracting journals. Tables show: (1) coverage by individual services and by combinations of services; (2) overlap between services; and (3) delay between publication of primary and of secondary literature. Chemical abstracts retrieved 79% of geochemical references and combined use of services generally retrieved over 80%. Depending on subject, between 47% (paleontology) and 84% (igneous and metamorphic petrology) of references appeared in two or more journals. For most services, the time lag for 80-90% of abstracts is 18 months.

WOODS, BILL M. (1971) Map librarianship: a selected bibliography. 3rd ed. Woodbridge (N.J.): New Jersey Library Association. 20p.

#### AGI TRANSLATIONS

(The following was received from Thomas F. Rafter, Assistant Director of Science Information, American Geological Institute, Washington, D.C.)

Researchers' need-to-know often poses serious problems and frustrations for information specialists, particularly in those situations where the science librarian must depend on outside sources for the requested information.

Undoubtedly, translations are close to the top of the list of "Why doesn't somebody do something about ...?"

Well, the American Geological Institute's Translations Program has taken a small step in what we hope will be the right direction to make information available.

I. Beginning with the 1972 volume year, all papers in the 9 geologically oriented sections of Doklady AN SSSR will be abstracted and published regularly (and as received) in International geology review (IGR). Although the publication of "Doklady: Earth Science Sections" is on a six-months-or-less schedule, our experience shows that some researchers need specific information between appearance of the original and the English translation. The first abstracts of Doklady AN SSSR, v.202, no.1 and 2 (1972) were published in IGR, v.14, no.5.

II. Although the Russian monthly journal, Geokhimiya, is translated cover-to-cover, publication of papers is selective in the bimonthly Geochemistry international. Papers not selected for publication are abstracted in each issue with directions for ordering photocopy.

This method has caused problems for researchers and information specialists alike, i.e. determining and/or locating what has been translated and its current availability.

Assistance in this problem area was effected with the preparation of a complete list of unpublished translations from Geokhimiya 1964-1968 and published in Geochemistry international, 1969, v.6, no.6, p.1198-1216.

Beginning with the 1970 volume year, and each volume year thereafter, a complete list of unpublished papers for the preceding year is published in the first issue (see Geochemistry international, 1970, v.7, no. 1, p.204-208).

#### GEO-REF

The American Geological Institute has produced a series of colored flyers describing GEO-REF. The information below is taken from these flyers.

"GEO-REF is a bibliographic system providing access to the geological literature of the world and supplying a variety of services in information transfer. At the end of 1971, its computer memory contained over 130,000 deeply indexed references starting with the 1966 literature, and more than 2000 journals are regularly scanned to provide from 3000 to 4000 new citations each month. Each reference in the magnetic tape-stored data base contains senior and junior authors, full title in its original language, English translation, publication information, content data, and natural language index sets providing up to 30 access points to the citation. Many of the referenced titles are enriched by annotative descriptors to denote the subject matter of the paper. The system also contains citations of books, monographs, symposia proceedings, contact reports, and dissertations. Lapsed time from the primary appearance of the literature to tape storage is as brief as one month and seldom exceeds six months. Thus, GEO-REF is a current-alerting service as well as an archival depository".

BIBLIOGRAPHIES. "Two bibliographies are regularly

produced by the GEO·REF system: the Geological Society of America's Bibliography and index of geology and the American Museum of Natural History's Bibliography and index of micropaleontology are printed each month from computer photocomposed pages containing the current references and meeting the specifications of their publishers. ... Other topically or discipline-defined bibliographies can be produced by the GEO·REF system for publication and distribution by interested institutions. ... Standard bibliographies composed from GEO·REF's existing data base are available at \$25.00 per page. Special reference listings and bibliographies will be quoted on a custom basis".

PRIMARY INDEXES. "GEO·REF is providing the annual indexes to twelve primary journals of geology published in the United States and in Europe": Bulletin of the Geological Society of America; Journal of geophysical research; Journal of sedimentary petrology; American mineralogist; Canadian journal of earth sciences; Marine geology; Geoderma; Geotectonics; Izvestia, atmospheric and oceanic physics; Review of geophysics and space physics; Tectonophysics; and Physics of the solid earth. "In addition, GEO·REF has created a ten-year cumulative index for one and is engaged in the preparation of fifteen-volume cumulatives for others".

TAPE LEASES. "The entire data base of GEO·REF, or its current monthly input, is available on tape in a choice of language formats and tape densities. ... Tapes are available in either ASCII or EBCDIC codes; 800 or 1600 bpi; seven or nine track. ... Leasing Arrangements. The monthly current awareness tape subscription is priced at 10¢ per reference; usually \$350 to \$400 per month. Subsets of the file are available at the same price plus a charge of \$71.25 to cover the cost of computer time and special selection. Prices for the complete retrospective file dating back to 1967 are as follows: 1967 (11,400 references) \$1,140; 1968 (17,260 references) \$1,726; 1969 (27,550 references) \$2,755; 1970 (30,310 references) \$3,031; and 1971 (35,263 references) \$3,526. Total price: \$12,478. Institutions with computer facilities will be granted the option of offering retrospective searches or SDI services to their clients. The annual royalty fee is \$24.00 per profile for SDI subscriptions and 10% of the charged fee on retrospective searches. GEO·REF will be pleased to send a test tape for programming and evaluation together with the necessary documentation. Advisory assistance to facilitate programming and search techniques is available to subscribers".

RETROSPECTIVE SEARCH. "GEO·REF offers a retrospective search service providing answers to queries addressed to its bibliographic data base containing citations from the primary journals, monographs, and symposium proceedings from 1966 up to this month's entries. Requests can be answered with a 24-hour turn-around, or sooner (by telephone) if required. Questions can be stated in any form or language, and will be formatted by our search editors before addressing the file".

## EARTH SCIENCE EDITORS

The 6th Annual Conference of the Association of Earth Science Editors (AESE) was held 15-17 October 1972 at the new headquarters building of the Geological Society of America in Boulder, Colo. The program had sessions on style manuals, on new production techniques, on format, design, and illustrations for producers and users, and on microforms ("think small"). Information regarding the meeting is available from John Heller, Chairman of Program Committee, U.S. Geological Survey, Denver Federal Center, Bldg.25, Denver, Colo. 80225.

The 2nd General Assembly of the European Association of Earth Science Editors (Editerra) was held 27-29 September 1972 at The Royal Society in London. Information regarding the meeting is available from A.H. Simpson, Institute of Geological Sciences, Exhibition Road, London SW7 2DE, England.

In 1969, Editerra adopted the following resolution: "It is considered very desirable that communication between earth-science editors and earth-science librarians and documentalists be improved. Unesco, IUGS, IUGG, and IGU are requested to take the necessary steps in this direction, preferably within the framework of existing organizations".

## DECADENCE IN GEOLOGY

Henry W. Menard, in his recent book Science: growth and change (Harvard Univ Press, Cambridge, Mass., 1971), contends that a dormant period existed in American geology between 1920 and 1955. As symptoms of this decadence, he cites: long lag-time for publication in the most prestigious journals; little encouragement given to budding new fields (such as oceanography and geochemistry) by the establishment geologists; increase of the cost of a page of publication; flourishing of bibliographies ("if fiscal winter comes, can bibliographies be far behind?"); and deterioration of the geologic literature as concern with style of writing grows, jargon is prevalent, and citations grow older.

In Menard's judgment, the sagging productivity of the U.S. Geological Survey that began in 1920 is attributed in large measure to overzealous concern with style and format of writing imposed by the Survey's style manual, Suggestions to authors. Claude Albritton, reviewing Menard's book in Science (12 May 1972, v.176, no.4035, p.639-641), disagrees with Menard: "Both the purpose and the effect of the manual are misunderstood. The purpose was to encourage authors to translate their manuscripts into English, which, as H.L. Mencken observed, is the most difficult of foreign languages for Americans. The effect was not to slow the rate of processing manuscripts ... Moving a manuscript through the Survey's mill has with some justification been compared to moving a cemetery, but the causes are mental and not manual" (p.640). Menard cites the vertebrate paleontologist, E.D. Cope, as the most prolific American writer in earth science with 1395 titles, followed by C.R. Keyes with 1293 titles and J.A. Cushman with 427.

GEOLOGICAL INFORMATION GROUP (GIG)

In November 1971, the Council of the Geological Society of London approved the Geological Information Group (GIG) as a "specialist group", and it has now become constituted as such. The purpose of GIG is to study "geological information (including data and literature) in all its aspects, including the principles of recording, indexing, collation, storage, dissemination and retrieval, editing and communication" by holding meetings, issuing publications, establishing liaison with other organizations, and encouraging research and teaching.

The need for a group to study geologic information in the United Kingdom was felt in 1969. In January 1970, the British Group of the International Association for Mathematical Geology (IAMG) held a colloquium on the structure of geologic information. Since the IAMG was primarily concerned with the analysis of data, the Council of the Geological Society of London in June 1970 set up a subcommittee under the chairmanship of W.B. Harland to investigate the possibility and desirability of forming a geological information group. In May 1971, a special general meeting of the Society was held on "the nature, sources and communication of geological information", and resulted in the formation of a steering committee. On approval of the Council of the Society, this committee became the acting committee of the Geological Information Group, with W. Bullerwell as chairman, Graham Lea as secretary, and J. Cutbill, T.B.H. Hall, W.B. Harland, R.A. Howie, and P. Wilkinson as members.

Various comments from Fellows of the Geological Society of London have helped the committee in defining the possible role and activities of GIG. It would appear that the Group should devote itself to the study of "information in geology", rather than the use of "computers in geology", thus encompassing the broad field of communication and liaison between geologists, as well as the gathering, storing, and retrieval of data.

Two working parties have been set up by GIG to prepare state-of-the-art reports, and both presented reports at a meeting in May 1972. The objective of the Working Party on Geological Data (J. Cutbill, chairman) is "to define the nature, structure and present state of geological data with a view to delineating areas in need of immediate research, and the development of methodology". It will consider acquisition, recording, processing, and management of data.

The Working Party on Geological Literature (Graham Lea, chairman) will study (a) the growth, development, and nature of primary literature, (b) the development of secondary services, (c) guides to geological literature, (d) development and scope of geologic organizations, (e) professional aspects, and (f) bibliography.

GIG will issue a newsletter.

CHAUTAUQUA ON QUANTIFICATION IN GEOLOGY

A "Chautauqua" on "The Impact of Quantification on Geology" was held 5 October 1972 during the three-day celebration dedicating the William B. Heroy Geology Laboratory at Syracuse University.

Quantification, the use of mathematics and computers in geologic research, has been employed by geologists for only a few years. Convened by Daniel F. Merriam, chairman of the geology dept at Syracuse, the Chautauqua consisted of six lectures. The speakers and their topics:

- A Trifling Investment of Fact (Gordon Y. Craig, Univ of Edinburgh)
- Quantification and the Future of Geoscience (John C. Griffiths, Pennsylvania State Univ)
- Is Being Quantitative Sufficient? (M. King Hubbert, U.S. Geological Survey)
- Milestones Along the Highway of Quantification in Geology (William C. Krumbein, Northwestern Univ)
- The Age of Zap (Richard A. Reymont, Syracuse Univ)
- Data as an Aid to Communication in Geology (S.C. Robinson, Geological Survey of Canada).

CODATA CONFERENCE

The 3rd International CODATA Conference on the Generation, Compilation, Evaluation, and Dissemination of Data for Science and Technology was held 26-29 June 1972 in Le Creusot, France. CODATA is the Committee on Data for Science and Technology, established in 1966 by the International Council of Scientific Unions (ICSU).

Session III of the conference was entitled "Earth and Atmospheric Sciences". The program:

- A. Introductory remarks by session chairman (M. Roubaud, CRPG, Nancy, France)
- B. COGEO DATA and its Activities (P. Laffitte, Vice President of COGEO DATA, Paris, France)
- C. Federation of Astronomical and Geophysical Services and its Activities (P. Melchior, IUGG Representative on CODATA, Brussels, Belgium)
- D. ICSU Panel on World Data Centres
- E. Illustrative Example: Handling of Geo-Data in the French National Geological Service (F.C. Dumort, BRGM, Orléans, France)
- F. International Oceanographic Commission (B.J. Thompson, International Oceanographic Commission, Unesco, Paris, France).

CODATA, at its 1971 General Assembly, broadened its scope, initially limited to the properties of chemistry and physics, to include the geologic, as well as the biologic and cosmic, sciences. CODATA therefore will include not only the coordination of numerical property data of substances and materials, but also of time- and/or location-dependent quantitative and systematic scientific data.

(more)

Related to the broadened scope of CODATA was a resolution adopted in September 1970 by the Committee on Storage, Automatic Processing and Retrieval of Geological Data (COGEODATA) of the International Union of Geological Sciences. Resolution No.10 reads:

"Considering that CODATA, as presently organized, clearly serves only disciplines whose data relates to universally standard substances, the Committee recommends that a similar interdisciplinary organization for data of the environmental sciences be created, either as a parallel branch to CODATA or somehow linked to it, and possibly in the framework of UNISIST.

"This organization would (a) make possible coherent application of data to the solution of local and international problems of health, agriculture, water supply, fuel and energy supply etc. ...; (b) ensure that overlap in function was resolved; (c) be a suitable vehicle to administer funds needed by committees such as this one; (d) bring about compatibility in those aspects of environmental data that are common to two or more disciplines".

#### GEOSCIENCE INFORMATION at the 24th IGC

(The following comments were prepared for the GIS Newsletter by Dr. C.F. Burk, jr., GIS Past President and National Coordinator, Canadian Centre for Geoscience Data, Geological Survey of Canada, Ottawa, Ont.)

The largest scientific meeting ever held in Canada took place in Montreal, 21-30 August 1972, when the 24th International Geological Congress (IGC) welcomed over 6000 delegates from 112 countries. An impressive program of technical sessions, field excursions, local tours, exhibits, social events, films, committee meetings, workshops, symposia, and ad hoc gatherings offered every conceivable outlet for the expenditure of time, energy, talent, and money. Most seized on the opportunity. All of these activities invite comment, to a greater or lesser degree, on their "information" significance, but my remarks here are limited to the major events.

Of the 17 technical sessions, all but two dealt with a substantive geoscience topic; exceptions were in the fields of education and information. The latter was featured in Section 16, "Computer-Based Storage, Retrieval, and Processing of Geological Information", organized jointly by the Committee on Storage, Automatic Processing and Retrieval of Geological Data (COGEODATA) of the International Union of Geological Sciences (IUGS), and by the Canadian Centre for Geoscience Data. The 26 papers presented dealt with topics ranging from field observations to international information systems, and attracted audiences of 30 to 80 during the 3 days of presentation. GIS members can purchase the proceedings of Section 16 for \$5.00 (Can.) from: 24th IGC, 601 Booth St, Ottawa K1A 0E8, Canada.

Following presentation of the last paper in Section 16, an enthusiastic group of about 25 held an ad hoc meeting to discuss generalized data-base management systems. Experts on systems such as GIPSY, SAFRAS, TELLUS, MARK IV, and SELGEM were on hand to exchange technical information, opinions, and news.

The second major Congress event dealing with geoscience information was the Computer Applications Workshop (Field Excursion C50) held at the Univ of Western Ontario, London, 1-5 September. Twenty-two participants from 11 countries were offered hands-on experience with an interactive, generalized, data-base management system (SAFRAS), gridding and contouring techniques, and the use of geometrical methods. The workshop leaders were P.G. Sutterlin, C.F. Burk, jr., and F.P. Agterberg. Among those attending was the new chairman of COGEODATA, Dr. André Hubaux. The enthusiastic participation of all those attending suggests that the use of computers in the geosciences will increase markedly, at least among the organizations represented at this meeting. Documentation on some of the computer programs used at the workshop will be published by the Canadian Centre for Geoscience Data.

Major meetings were held by two information-oriented organizations belonging to the IUGS: the Committee on Geological Documentation, chaired by Dr. L. Delbos, and COGEODATA, chaired initially by Dr. S.C. Robinson, but later turned over to his successor, Dr. Hubaux. The results of these meetings will be publicized in the IUGS Geological newsletter.

Having been closely involved in the preparation of many of the above activities, I was skeptical prior to the great event that they would be as successful as we planned. Without question, however, they were tremendously successful. The ingredient I had not taken account of was the personal involvement of a diverse international group of specialists, generalists, and in-betweeners, all intensely concerned with the topic at hand: geoscience information. The future effects of the 24th International Geological Congress in this field will be significant indeed.

#### INTERNATIONAL GEOLOGICAL CORRELATION PROGRAM

The idea of a long-term program of international cooperation in major fields of geologic sciences was first introduced in 1964 into Unesco's general program. At an intergovernmental conference of experts, held at Unesco House 19-28 October 1971, the principles for the preparation of the International Geological Correlation Program (IGCP) were established. The conference resulted in the recommendation for a joint program of Unesco and the International Union of Geological Sciences.

Scientific areas of interest which will receive most attention of IGCP include among others: standardization problems of terminology and classification; and automatic data processing, in particular the form of presentation of stratigraphic data for storage, cre-



ation of data on mineral deposits, and automatized geologic cartography. Special attention at the conference was given to education and training within this program. The secretariat of IGCP will eventually be located at Unesco Headquarters, Paris. A special Project Working Group will coordinate international participation in any-IGCP project.

#### EARTHQUAKE DATA FILE

The National Geophysical Data Center (NGDC) has announced the availability of its Earthquake Data File in a new format. This data file, which contains information on 51,839 earthquakes (or related events) for the period 1 January 1961 through 31 December 1971, lists (when available) the date, origin time, geographic location, focal depth, magnitude, and Modified Mercalli intensity for each event. The expanded service offers these data sorted geographically on magnetic tape, microfilm, or microfiche. NGDC will continue to make available on magnetic tape a chronological listing of the Earthquake Data File, and monthly shipments of earthquake data on punched cards.

The cost of furnishing a 16-mm microfilm or a microfiche copy of the entire geographically sorted file is \$10; a magnetic tape copy of the file, sorted either geographically or chronologically, may be obtained for \$60; a subscription for monthly punched cards is available for \$60 per year. For additional information, contact NGDC, Environmental Data Service, National Oceanic and Atmospheric Administration, Boulder, Colo. 80302.

#### GEOPHYSICS DATA

The National Oceanic and Atmospheric Administration (NOAA) has set up a new data center in Boulder, Colo., called the National Geophysical & Solar-Terrestrial Data Center. It covers data activity in fields including seismology, geomagnetism, marine geology and geophysics, and interplanetary phenomena. For more information, contact Environmental Data Service, NOAA, D6, Boulder, Colo. 80302.

#### NORTH DAKOTA GUIDEBOOKS

In 1960 and 1961 the Dept of Geology of the Univ of North Dakota published two guidebooks. Guidebook no.1 is Guidebook to the geology of the Black Hills and route between Grand Forks and Rapid City, and guidebook no.2 is Guidebook to the geology of southeastern Minnesota and northeastern Iowa and routes between Grand Forks, North Dakota, and Dubuque, Iowa. These are both out of print but Beta Zeta Chapter of Sigma Gamma Epsilon, which originally prepared both books, has decided to make available unbound photocopies of the guidebooks. The cost, including postage, will be \$6.00 for guidebook no.1 and \$8.65 for guidebook no.2. Inquiries should be addressed to: Secretary-Treasurer, Beta Zeta Chapter,

Sigma Gamma Epsilon, Dept of Geology, Univ of North Dakota, Grand Forks, N.D. 58201.

Guidebook no.3 of the geology department is Depositional environment of the lignite-bearing strata in western North Dakota. It is the guidebook for field trip no.8 of the 1972 meetings of the Geological Society of America. The cost is \$5.00.

#### ELECTRONIC LIBRARY OF ROCK ANALYSES

The Rock Information System (RKNFSYS), operated at the Carnegie Institution of Washington with funds from the U.S. National Science Foundation, provides retrieval and reduction of data concerning the chemical composition of Cenozoic volcanic rocks. The data file contains over 10,000 published analyses of such rocks and a bibliography of source references.

File searches may be keyed by any one or combination of geographic indices, rock names, system parameters, or arbitrary linear combinations of the latter. Available reduction services include univariate sample frequency distributions, principal component analysis, discriminant function calculations, and sample frequency distribution of ternary ratios. Source reference bibliographies and limited data listings can also be obtained. During the current pilot test there is no charge for system services. For further information, contact Felix Chayes, Geophysical Laboratory, Carnegie Institution of Washington, 2801 Upton St, N.W., Washington, D.C. 20008.

#### GEO ABSTRACTS

Beginning in 1972, Geo abstracts added a new section to its series of abstract journals: Section E, covering the literature of Sedimentology. The journal will appear 6 times a year with each issue containing between 200 and 400 abstracts. It is edited by I.N. McCave of the School of Environmental Sciences at the Univ of East Anglia, Norwich, Eng.

The coverage of Section E includes hydraulic and sediment transport, oceanographic studies, sedimentologic interpretation of rocks, sedimentary geochemistry, and all aspects of recent sediments classified on an environmental basis. Literature sources include the standard geologic literature as well as that of civil engineering, and attempts will be made to scan the literature from eastern Europe.

The arrangement of Geo abstracts, formerly Geographical abstracts, has been changed to some extent. Section A, formerly "Geomorphology", is now "Landforms and the Quaternary"; it has acquired soils from Section B, but has yielded up its sedimentology, coastal morphology, and submarine morphology to Section E. There is no duplication of abstracts among any of the sections of Geo abstracts.

For further information, write: Geo Abstracts, Univ of East Anglia, Norwich NOR 88C, England.

EPA COOPERATIVE PROGRAM

The Environmental Protection Agency (EPA) has announced a program of cooperation with science information centers. This cooperative agreement was undertaken with the firm conviction that existing systems and services should be used whenever possible, rather than creating new ones.

Under the new program, the information service centers of three universities will be coordinated for EPA use. Lehigh University has been selected to provide on-line services, the University of Georgia will be responsible for batch and retrospective services, and Ohio State University will produce selected SDI programs on a trial basis. This program, in cooperation with the Office of Science Information Service of the U.S. National Science Foundation, will permit EPA access to more than 25 data bases, while determining usage requirements of the various files and services.

This arrangement will serve a network of 40 EPA libraries and information centers, with the library at EPA's National Environmental Research Center in Cincinnati, Ohio, designated as access point to the information centers. A series of terminals will soon be installed in Cincinnati to provide on-line and/or batch search and retrieval capabilities. In this manner each EPA facility will be able to search more than 2 million documents and receive a print-out with a minimum of delay. Eventually this network will be expanded to improve data-base coverage and to provide additional services to EPA personnel interested in searching data bases of literature concerned with the environment.

NEW SATELLITE FOR NATURAL RESOURCES DATA

The first Earth Resources Technology Satellite (ERTS) has been launched as the first space vehicle of the EROS (Earth Resources Observation System) program of the U.S. Geological Survey. The Washington State Dept of Natural Resources is under contract to the EROS program to survey the natural resource management community in order to determine how and where EROS remote-sensed data can be applied to the needs of the Pacific Northwest Region.

This pilot program represents a milestone in resource management in that it provides, for resource managers throughout the world, a new tool and a new source of data with the capability for capturing broad, repetitive information. The data received from the satellite have many applications, from showing the development of urban areas near a city to exposing the presence of diseased trees in a forest.

Information from the satellite will be collected and stored at the EROS data center near Sioux Falls, South Dakota. The data will be available to Federal and state government users, industry, and schools. For further information, contact Robert B. Scott, Remote Sensing Coordinator, State of Washington, Dept of Natural Resources, Olympia, Wash. 98501.

WATER RESOURCES NETWORK STUDY

The feasibility of a national computer network of retrieval centers for water resources information will be studied by the Univ of Oklahoma under a \$99,858 grant from the U.S. Interior Dept's Office of Water Resources Research (OWRR).

The grant also covers initiation and service for the first three of these centers located at the Univ of Wisconsin, Cornell Univ, and North Carolina State Univ. These centers, as well as the Water Resources Scientific Information Center (WRSIC) in OWRR, will be connected by remote terminals and telephone lines to the Merrick Computing Center facilities at the Univ of Oklahoma.

The Generalized Information Processing System (GIPSY) developed by the Univ of Oklahoma will be used, and will allow computer searches of the OWRR-WRSIC data base, containing about 40,000 full-text abstracts in all fields of water resources, to be requested from any one of the three retrieval centers.

CATALOGS OF MOON SAMPLES

The U.S. National Aeronautics and Space Administration (NASA) publishes "Lunar Sample Information Catalogs" which give the final descriptive information about the Moon rock specimens collected on Apollo missions. The catalogs contain the locations where samples were collected, orientation of specimens with relation to other materials, types of samples (loose boulder, bed rock, etc.), full petrologic and petrographic description of each sample, and other information. Copies of the catalogs for Apollo flights 15 and 16 are available from Dr. Michael Duke, Lunar Sample Curator, Mail Code TL-4, NASA-MS, Houston, Tex. 77058. Catalogs for earlier flights are out of print.

GEOHERMAL RESOURCES COUNCIL

Among the purposes of the recently incorporated Geothermal Resources Council, a world-wide organization dedicated to the encouragement of exploration and development of geothermal energy, is the coordination of information activities.

The U.S.-based council, a non-profit, non-stock organization with a membership of more than 500, will serve as a public forum to provide objective and unbiased information on the nature of geothermal energy and its development, to encourage the collection and dissemination of data related to geothermal resources and development, and to cooperate and communicate with national and international agencies in the collection and dissemination of information.

Chairman of the council's board is Richard G. Bowen, an economic geologist at the Dept of Geology and Mineral Industries, State of Oregon, Portland. For further information, contact Geothermal Resources Council, P.O. Box 1033, Davis, Calif. 95616.

ARCH C. GERLACH

Dr. Arch C. Gerlach, Chief Geographer of the U.S. Geological Survey and former Chief of the Library of Congress' Geography and Map Division, died 20 May 1972 of cancer following a long illness. He was 61.

An international authority on geography and cartography, Dr. Gerlach was the editor of the National atlas of the United States, a cartographic volume of the physical, historical, economic, and social characteristics of the U.S. He also served as coordinator of the USGS's geographic applications program for remote-sensor data from aircraft and spacecraft, and he was president of the Pan American Institute of Geography and History. In 1971, he received the Dept of the Interior's highest award, the Distinguished Service Award, for his work in geography and thematic mapping.

The Association of American Geographers, 1148 16th St, N.W., Washington, D.C. 20036, is receiving contributions for the Arch C. Gerlach Memorial Fund.

USGS TOPO QUAD MAPS

The price of standard topographic quadrangle maps published by the U.S. Geological Survey was increased on 1 September 1972 from 50¢ each to 75¢. Included are maps at scales of 1:24,000, 1:62,500, and 1:63,360.

The Survey also increased the price of its 1:250,000-scale map series from 75¢ to \$1. Base maps, National Park maps, and other special maps published by the Survey are individually priced, and may also go up. But the USGS now allows a higher discount for bulk orders--30% off on all orders of maps amounting to \$300 or more. Indexes to topographic maps for each of the 50 states, American Samoa, Guam, Puerto Rico, and the U.S. Virgin Islands, and an information booklet on topo maps and symbols, are available free from Survey Distribution offices: 1200 South Eads St, Arlington, Va. 22202; Federal Center, Denver, Colo. 80225; and 310 Fairbanks Ave, Fairbanks, Alaska 99701.

USGS SEEKS ASSISTANT CHIEF LIBRARIAN

The U.S. Geological Survey Library in Washington, D.C., is seeking an Assistant Chief Librarian, GS-13. Present salary range: \$18,737 to \$24,362. Candidate should possess: (1) Master's degree in Library Science; (2) extensive knowledge of and experience in a variety of library functions, which would include several of the following (technical processing, cataloging & classification, reference, inter-library loan, circulation, maps, and automation); (3) record of solid supervisory experience in research and science libraries. Science background desirable, but not mandatory. Position requires at least 3 years of appropriate experience, one of which must have been equivalent to the GS-12 level.

Person selected will assume a major role in the day-to-day administration of the Geological Survey Library system and actively participate at the planning level in developing and implementing new ideas and programs to improve current services and practices.

Candidates should see that their names are placed on the appropriate Civil Service Register and that they have a Notice of Rating as being qualified for GS-13 level positions, by filing an application blank (SF-171) with the Interagency Board of U.S. Civil Service Examiners--WAS, 1900 E St, N.W., Washington, D.C. 20415. A completed SF-171 should also be sent to: George H. Goodwin, jr., Chief Librarian, U.S. Geological Survey Library, Room 1033, GSA Bldg, 18th and F Streets, N.W., Washington, D.C. 20242 (phone: 202/343-3863, or IDS code 183-33863).

All qualified applicants will receive consideration for appointment without regard to race, religion, color, national origin, sex, political affiliations, or any other non-merit factor.

USGS/EROS SEEKS LIBRARIAN

Librarian, GS-9, Washington, D.C., part-time (37 hrs per week, 11 months per year). Librarian to maintain and operate a small but growing earth resources/remote sensing library. Opportunity to get in on the ground floor. The applicant will recommend accessions, catalog, assist users, supervise loan records, prepare bibliographies, and prepare collection catalog for input to USGS GIPSY computer program. Applicant should have background in natural sciences, and MLS including some exposure to computerized search and retrieval. Applicant must have MLS to qualify for GS-9. For further information, contact U.S. Geological Survey, EROS Program, Room 827, 1717 H St, N.W., Washington, D.C. 20242 (phone: 202/343-7500).

All qualified applicants will receive consideration for appointment without regard to race, religion, color, national origin, sex, political affiliations, or any other non-merit factor.

GIS OFFICERS

President: Dr. Roy W. Graves, Information Specialist, Information Services Dept, Univ of Tulsa, 1133 North Lewis Ave, Tulsa, Okla. 74110 (918/939-6351, ext. 296 or 297)

Vice-President: Hartley K. Phinney, jr., Supervisor, Technical Information Center, Chevron Oil Field Research Company, P.O. Box 446, La Habra, Calif. 90631 (213/691-2241, ext.110)

Secretary: Mrs. Kathryn N. Cutler, Head Librarian, Branner Geological Library, Stanford Univ, Stanford, Calif. 94305 (415/321-2300, ext.2746)

Treasurer: Janet Meserve, 1301 Delaware Ave, S.W., Apt. N411, Washington, D.C. 20024 (at work: 202/426-5342)

Past President: Dr. Cornelius F. Burk, jr., National Coordinator, Canadian Centre for Geoscience Data, Geological Survey of Canada, 601 Booth St, Ottawa 4, Ontario, Canada (613/994-9780)

GIS TECHNICAL SESSION at GSA MEETINGS

The GIS Technical Session will be held Monday, November 13, 1972, in the Diamond Room of the Minneapolis Convention Center, from 8:30 a.m. to 11:25 a.m. Presiding: Roy Graves, GIS President. Abstracts of the papers are given below. Speaker's name is underlined.

8:30-8:55 a.m.

Harold L. Cousminer (Dept of Geology, Rutgers University, Newark, N.J. 07102) and Julia Golden (Micropaleontology Press, American Museum of Natural History, Central Park West at 79th St, New York, N.Y. 10024): ANOTHER PRODUCT OF GEO-REF: THE BIBLIOGRAPHY AND INDEX OF MICROPALAEONTOLOGY.

The American Museum of Natural History in cooperation with the American Geological Institute is publishing a new specialized bibliography, the Bibliography and index of micropaleontology, from the GEO-REF computerized data base. We believe that the procedures we follow can be used for the production of specialized bibliographies in other areas of geoscience.

Both institutions supply citations and subject indexes for current worldwide literature in micropaleontology to GEO-REF. The following procedures were adopted to facilitate the smooth operation of the project: (1) establishment of a computer program which enables the citations to be listed by microfossil group; (2) weekly telephone conferences to avoid omission and duplication of citations; (3) utilization of established GEO-REF citation and subject index set conventions; and (4) addition of keywords, which follows guidelines set by the Museum, to describe the content of each paper.

The Museum receives a monthly photocomposed printout from GEO-REF which is then published and distributed to subscribers throughout the world. GEO-REF will also produce an annual subject index which will carry an average of five index sets for each citation.

It is hoped that the results of this project will encourage other geoscientists to utilize the facilities of GEO-REF to produce similar bibliographies.

A cost analysis for the development of the system and the first nine months of operation is presented.

\*

8:55-9:20 a.m.

Joel J. Lloyd (American Geological Institute, 2201 M St, N.W., Washington, D.C. 20037): GEO-REF: A REPORT AND FORECAST.

GEO-REF is the American Geological Institute's magnetic tape-stored file of bibliographic references to the world's geologic literature. It now contains over 200,000 citations from 1965 and is being augmented by approximately 3500 current references a month. As such it is the largest indexed geologic bibliographic service in the world, and certainly the most versatile. In addition to the two monthly bibliographies that are derived and printed from its data base (Bibliography and index of geology and Bibliography and index of micropaleontology), it produces the volume indexes for thirteen primary journals, distributes machine-readable tapes to institutional and industrial data

centers, conducts retrospective searches of its total file, and can produce, on demand, printed bibliographies on any topic or geographic area related to the earth sciences.

The operation is being supported by a deficit funding grant from the National Science Foundation but it is hoped that the operation will be self-sustaining by 1975. Marked progress has been made toward that goal in the past years through the introduction of operating efficiencies and concerted marketing efforts. In order to reach the 1975 objective, however, the system will require the support of the geologic community through greater use or via a contributory role that will provide equal benefits to GEO-REF and to the contributing groups.

\*

9:20-9:45 a.m.

John H. Schuenemeyer (Computer Center, Univ of Georgia, Athens, Ga. 30601) and George S. Koch, jr. (Geology Dept, Univ of Georgia, Athens, Ga. 30601): COMPUTERIZED LITERATURE SEARCHING IN GEOLOGY.

Computerized literature searching provides an efficient economical method of staying abreast of current literature and reviewing existing documents. Geologists, like other scientists, are faced with the problem of keeping up with the ever-increasing volume of literature in the earth science field. In addition, multidisciplinary problems, such as those in the environmental area, require the geologist to be aware of current developments in many fields. Thousands of documents in the earth science area have been referenced on computer-searchable magnetic tapes. Document coverage includes articles, books, government reports, and maps.

The University of Georgia Information Dissemination Center provides computerized literature searching to students and faculty in the state-supported colleges and universities within the University System of Georgia. Services are also provided to industry and other academic institutions on a cost-recovery basis. Several of our data bases, such as GEO-REF, are devoted largely to geology; however, many other bases (including Chemical Abstracts, COMPENDEX, Biological Abstracts, and Government Report Announcements) also contain document coverage of interest to the earth scientist. Search questions are prepared by the researcher assisted by an information scientist and then are entered into the computer system via an on-line terminal. Search answers are citations of the pertinent papers or other documents. These answers are printed on a terminal which may be adjacent to the computer or at a distant site connected by telephone lines. Examples of searches presented are those in regional geology, tectonics, economic geology, and land reclamation.

\*

9:45-10:10 a.m.

Eric C. Dahlberg (Amoco Canada Petroleum Company Ltd, 444 Seventh Ave, S.W., Calgary, Alberta, Canada): ASPECTS OF UNBIASED AND BIASED CONTOURING OF GEOLOGIC DATA BY HUMAN AND MACHINE OPERATORS.

Representative contouring of geologic map data seeks to estimate the most likely configuration of an incompletely known surface from a sample of spa-

tially distributed data points. Each contour line is, in effect, a statistic since it represents an estimate of a "true" value at an explicitly located geographic point.

By contrast, interpretive contouring presents a visualization of a conceptually meaningful geologic form such as a barrier bar, stream channel, dune, or beach which the data could conceivably reflect. Each contour line is now a biased estimate based on speculation and additional information such as regional fabric and lithology, constrained only by the control points.

Thirty versions of a twelve-point model map contoured by experienced professional geologists demonstrate the astonishing degree of variation attributable to just human differences.

Quantitative analyses of these maps suggest that: (1) areas of major ambiguity are mathematically predictable as a function of control point configuration; (2) machine-contoured maps closely approximate the unbiased "consensus" map; and (3) the degree of interpretive license displayed by maps of the same data contoured according to delta front, salt dome, reef and channel, stream erosion, and other models can be compared to and isolated from random operator variation.

Statistical methods for exposing subjective and objective aspects of contour maps serve geologists who are asked to accept hypotheses based on map evidence (in the scientific sense) and managers who bet cash on them (in the economic sense).

\*

10:10-10:35 a.m.

Paul M. Junemann (IBM Corporation, 899 Logan St, Denver, Colo. 80217): COMPUTER-BASED GEOLOGIC INFORMATION SYSTEMS FOR MINING.

The worldwide growth in the demand for mineral products is forcing the mining industry to utilize new tools in the exploration, evaluation, design, and production of mineral deposits. The increasing costs of exploration requires the use of more efficient techniques and the increasing volumes of exploration data have caused all but automated processing to become impractical. The digital computer has been of great value in many mineral exploration projects, but its use has often been restricted by the lack of an organized system of geologic information.

The creation of a geologic information system requires very extensive and detailed planning. The utilization of a geologic information system also requires planning and, in addition, imagination. Mining exploration data are extremely varied in age, format, scope, and reliability. The merging of various data into a common system is usually difficult. The information system must allow for future types of data not currently used or known.

The design of a geologic information system must result in ease of utilization if it is to be successful. A geologic information system must be usable through the stages of exploration, evaluation, mine design, and production. Information at all stages should be available to and usable by all levels of a mining company.

Application problems and solutions will be discussed.

\*

\*

10:35-11:00 a.m.

Bruce B. Hanshaw (U.S. Geological Survey, Washington, D.C. 20242): PROPOSED INTEGRATED PROGRAM FOR PROVIDING RESOURCE AND LAND INFORMATION.

Complex problems stemming from the interaction of population and economic growth, resource depletion, and environmental pollution are critical and are accelerating in degree and in number. The requirements imposed by the National Environmental Policy Act and the proposed Land Use Policy and Planning Assistance are two examples of Federal legislation dealing with just such problems. Resolution of these complex problems is often rendered more difficult because the data and information required are not available to decision-makers. In some cases, the information needed simply does not exist, but all too often established organizations with competence in special disciplines are repositories of valuable but frequently underused data because there are no adequate means to bring the required information together and no adequate channels of communication to get the information to the agencies or users faced with the broader problems of increasing importance. Considerations of time and economy make it imperative that the work of the many existing organizations that collect, process, and interpret data for their own purposes, but whose information can contribute to cooperative integration in a broader problem-solving endeavor, be brought together.

The proposed program will provide: (a) a broad data acquisition capability encompassing conventional techniques and sophisticated remote sensing from satellites and aircraft; (b) a national information system network utilizing libraries as well as computer systems; and (c) interpretation, analysis, and translation of the data into products that are applicable by the user to the problem.

Depending on the user's needs, his requirements would be satisfied by raw, interpreted, or derivative data, by analytical predictions, or by analyses of alternative policies and their impacts. The data could be provided as tabular or point data, maps, reports, and computer tapes.

\*

11:00-11:25 a.m.

Clarence A. Sturdivant, Betty J. Miyahara, and Stephen O. Boyle (Marathon Oil Co., Denver Research Center, Littleton, Colo. 80120): THE DEVELOPMENT AND INITIAL USE OF COMPUTER-BASED GEOSCIENCE INFORMATION FILES AT MARATHON OIL COMPANY.

Marathon Oil Company's research center has developed several commercially available geoscience-related files for computerized literature searching. Included are GEO-REF (AGI), the Bibliography and index of North American geology (USGS), Geophysical abstracts (USGS), and selected portions of both Petroleum abstracts (Univ of Tulsa) and Government report announcements (NTIS).

Problems encountered in converting these files for use by reformatting them to a common API standard format, in developing subject authority lists and discovering "tricks" for searching them, and in developing customer relationships for their eventual exploitation for both retrospective and current awareness (SDI) were plentiful and varied. These have been offset by the benefits the files are likely to produce in aiding the geologic and geophysical research efforts of the company.