The Geochemical News

NUMBER 53 SEPTEMBER 1971

GEOCHEMICAL SOCIETY COUNCIL MEETING
November 10, 1970, Room 1907, Sheraton Schroeder Hotel, Milwaukee

Attendance: Gary Allen, Edward Anders, Ernest E. Angino, H. Barnes, Ellis E. Bray, J. Gordon Erdman, Frank Flanagan, Donald L. Graf, Bruce B. Hanshaw, Heinrich D. Holland, Konrad B. Krauskopf, Keith A. Kvenvolden, A.A. Levinson, Edwin Roedder, Denis Shaw, Brian J. Skinner, Robert I. Tilling, and J.B. Thompson.

REPORTS OF OFFICERS

Secretary's Report: The American Geological Institute has been handling all membership files and mailings of the Society for some years. As of October 20, 1970, a printout by the AGI of the Society's total membership shows 2011 members, with 1601 (80%) from U.S. and Canada, and 410 (20%) from overseas. There were 348 (17%) indicated as affiliated with the OGD. This represents a drop of 24 in total membership from last year. These data are erroneous, however, although perhaps with compensating errors. A check on an arbitrary 53 names pulled from the lists of new members whose names were submitted to AGI within the 18-month period February 10, 1969 to August 20, 1970 shows that *only about 30%* of all new members sent to AGI were actually put on the Society mailing list during this period. In this connection I would like to ask that anyone who is not getting the Society mailings get in touch with the Secretary, and if you hear others complain of this problem, please ask them to write in, so that our mailing list can be freed of errors. (See Treasurer's report for action taken on this intolerable situation).

In the early part of this year the Secretary again had some problems with obtaining even the courtesy of a reply from Pergamon Press concerning complaints from members about non-delivery of subscriptions. However, a very strong letter to Pergamon in April has apparently brought results, as this office has not received any letters from the membership about lack of response from Pergamon to subscription complaints for an unprecedented 6 months.

January 11, 1971
Edwin Roedder, Secretary

Treasurer's Report for the period January 1, 1970 to October 27, 1970: It is a pleasure to report that the financial status of the Society continued to improve during the 1970 fiscal year although less dramatically than in the past several years. The major increase in expenses is from assessments made by the AGI for mailing and other services. Excesses of income over expenses for the period amounts to $1,173.13.

Despite the increase in expenses charged by AGI, and despite frequent letters and phone calls to AGI concerning the abominable condition of our Society's address service from AGI, the outlook has not improved. In light of this fact, and in view of the proposed dues increase to make the Journal part of the dues structure, I recommend that the Society consider removing all of its mailing and addressing services from AGI and that it set up a computer-based address and dues handling service with an independent computer organization.

My initial recommendation for discussion at the Council meeting is as follows: (1) that with the 1971 dues mailing to be done later this month, we enclose a notice explaining the dues increase for 1972 and the method of its operation; (2) that the operation be as follows; using a computer-based system all current membership will be billed $15.00 for calendar 1972. The dues notices will be mailed on or about October 1, 1971. As dues are received in 1972, names will be given *weekly* to the computer and a printout of each *month's* payees will be obtained on the last working day of each month, and this list will be sent to Pergamon on a monthly basis. Members will be given a six month period (until the end of March 1972) to pay dues. On that date any member who has not paid dues will have his name withdrawn from the computer base and these names will be sent to Pergamon so that they may delete these members from their Journal mailing list. At this time we could notify the member that he has been dropped. This 31 March date is, I understand from Ed Roedder, in line with Pergamon's current procedure of carrying Journal subscribers for a three month grace period into the subscription year.

I herewith ask for the Council's guidance concerning the above-proposed procedure, and will report our decision to the AGI House of Representatives at its meeting on 14 November.

Bruce B. Hanshaw, Treasurer

(Editor's Note: It has been the custom to publish only the fiscal year (Jan. 1 to Dec. 31) report in *The Geochemical News.* This is not yet available and will be published in a subsequent issue.)

COMMITTEE REPORTS

Auditing: No report - books will be audited at the close of the fiscal year (Dec. 31).

Nominating: In accordance with the new election procedures, the slate was submitted by the Nominating Committee and approved by the Council by mail this Spring. It consisted of H.D. Holland (Pres.); F.R. Boyd, Jr. (V. Pres.); H.L. Barnes and H.J. Greenwood (Council) D. Shaw (Editor); and E.E. Angino (Secretary). The membership was so notified, and as no alternates were nominated, this slate was elected.

Program: This is my report as Chairman of the Program Committee representing the Geochemical Society to the Joint Technical Program Committee (1970) of the GSA. The other members of the committee are Donald H. Lindsley and, for Organic Geochemistry, Derek Spencer.

The program for the 1970 GSA meetings in Milwaukee was planned so that all papers in geochemistry, mineralogy, and petrology were combined for purposes of evaluation and scheduling. In particular, I worked closely with David Stewart, William Luth, and Arnulf Muan of the Mineralogical Society. This approach worked well and I urge that it be made a continuing policy for future meetings. It is the only way that scheduling conflicts can be kept to a minimum. This is important in view of the fact that this group schedules approximately one third of the papers of the meeting.

A total of approximately 184 papers was reviewed and 145 of these were accepted for presentation. This total does not include papers to special symposia.

There is a clear difference of opinion between the group dealing with the geochemistry, mineralogy, and petrology papers and the other members of the technical program committee. We find ourselves very highly squeezed for time, so that we have at least two sessions, and sometimes four, running concurrently. The others have a much looser schedule. This, despite the fact that we plan for 15 minute talks (10 minutes plus 5 for discussion) whilst many of the others permit 20 minutes. We, therefore, find ourselves trying to expand the time for the sessions. We are essentially the only ones trying to do this. So long as we retain a three day format for GSA this problem will be with us.

Possible ways to alleviate this problem would include: schedule MSA and GS business meetings and presidential addresses for the late afternoon or evening; plan for more discussion paper sessions in the evenings; use a fourth day of meetings; cut down on the number of accepted papers. We in GS would have less difficulty in scheduling for the first item than would MSA. I recommend the second. We probably would have a negative response from GSA, and from some of our members, if we tried to extend the meetings to four days. The reduction in total papers cannot be done sufficiently to ease the program bind without possible deletion of papers that really deserve to be heard.

It is imperative that all organizers of special symposia of interest to GS be required to inform the GS representative of the title of the symposium, general objectives, names of reviewers of abstracts to these symposia, and duration of the symposium. This needs to be done in advance of the JTPC meeting in Boulder in August to permit appropriate inclusion of these sessions into the program.

It is my understanding that Donald H. Lindsley will be my successor for 1971. I wish to thank him, Derek Spencer, and the representatives from MSA for their hard work, cooperation, and high standards of performance in working on this program.

Bruno J. Giletti (Chairman)

(Secretary's note - The Program Committee is *not* responsible for the sins of omission and commission in the GSA announcements of the Geochemical Society's events at this Annual Meeting).

Tellers: The result of the voting on the question: change in By-Laws Article 1 of Geochemical Society to the new wording is as follows:

In favor	758
Opposed	291
Invalid ballots	4

This represents a vote of 72.3% in favor of the change of the By-Laws Article 1 and 27.7% against.

Mary E. Mrose
E.C.T. Chao

(Secretary's note - This change in the By-Laws changes the dues to $15.00 and includes *Geochimica et Cosmochimica Acta* with membership).

Standards:

I. Task force on isotopic standards and reference samples. A one-year task force was established as a subcommittee of the Standards Committee to evaluate the present status of and future requirements for isotopic standards and reference samples. An evening discussion session entitled "Isotopic and Rare Earth Standards – Present Status and Future Necessity" was held on April 23, 1970 during the American Geophysical Union Annual Meeting in Washington, D.C. Rare earths were included because they behave somewhat like stable isotopes and interest in rare earth standards was expressed by both electron probe users and by rare earth specialists who standardize samples for electron probe users. It was established that no appropriate standards or reference samples exist and the matter is referred to the 1970-71 task force on probe standards.

An oxygen isotope reference sample was also thought to be desirable. Hugh Taylor (Division of Geological Sciences, California Institute of Technology, Pasadena, California, 91109) has a useful reference sample and interested investigators should address inquiries to him. P. Blattner (N.Z. Geological Survey, P.O. Box 30368, Lower Hutt, New Zealand) has suggested (personal communication to Flanagan, 1970) that U.S. Geological Survey G-2 be used as an isotopic reference sample; he is presently making observations to determine if the isotopic oxygen content is homogeneous among bottles.

Other topics receiving greater emphasis during the year were the rare gas reference sample, K-Ar dating reference samples, Rb-Sr dating reference samples, whole-rock lead isotope reference samples and U-Th-Pb analyses, and U-Th-Pb dating reference samples that are discussed below in that order.

1. Rare Gas Reference Sample. The sample, UCB-BCR-2, was reported at the Colloquium on the Geochemistry of Phanerozoic Orogenic Belts, Switzerland (Sept. 1969) to be too gassy but the problem may not be as severe as first thought. Information on the sample sent by John Reynolds (Dept. of Physics, University of California, Berkeley, California, 94720), distributor of UCB-BCR-2, to Marvin Lanphere of the Task Force is as follows:

a. The sample has been distributed to about 40 investigators, of whom only two have reported data. Reynolds has sent the recipients of the sample a short note with the preliminary data and he requests that those who have anayzed the sample send him the data available.

b. The data presently available, with the error expressed as percent mean deviation, are:

No. of detns	Ar (ccSTP/g)	K (%)	Laboratory
7 Ar 10 K	$8.92 \times 10^{-7} \pm 1.35\%$	$1.56 \pm 1.32\%$ [1/]	Curtis, Univ. of Calif.
3 Ar 6 K	$8.98 \times 10^{-7} \pm 0.37\%$	$1.62 \pm 2.0\%$ [2/]	Naughton, Univ. of Hawaii

[1/] Flame Photometry [2/] Atomic absorption

Naughton also reports a helium content of $1.42 \pm 0.02 \times 10^{-6}$ ccSTP/g.

c. Reynolds concludes that the general gassiness is not an insurmountable problem, that the sample should be prebaked at 100°C or lower, and that the large quantity of material still available (10 kilograms) makes the sample very useful. Requests for, or data on, the sample should be sent to Reynolds at the address above.

2. K-Ar Dating. Recent data on the now-exhausted USGS-P-207 muscovite is being compiled by Brent Dalrymple (U.S. Geological Survey, 345 Middlefield Road, Menlo Park, California, 94025). It is anticipated that the compilation will be published in a U.S. Geological Survey report. Data or inquiries should be sent to Dalrymple.

A compilation of K-Ar data on reference sample B4M (Bern 4 muscovite) and some data on B4B (Bern 4 biotite) have been recently published (Colloquium on the Geochemistry of Phanerozoic Orogenic Belts). For information write to Emilie Jäger, Mineralog.-Petrograph. Institut, Universität Bern, Sahlistrasse 6, Bern CH-3000 Switzerland. These samples have also been analyzed for Rb-Sr dating (see below).

3. Rb-Sr Dating. E. Jäger reports that she still has available 47 portions of Bern 4M muscovite and 72 portions of Bern 4B biotite. As the supply of USGS-P-207 is now depleted, the B4M muscovite becomes the prime K-Ar reference sample but both Bern samples are suitable for Rb-Sr dating, Inquiries should be directed to Prof. Jäger.

No new data on the U.S. Geological Survey rocks or on the two Geological Survey of Japan rock reference samples have been noted during the past year.

Stanley Hart (Dept. of Terrestrial Magnetism, 5241 Broad Branch Road, N.W., Washington, D.C., 20015) reports that he still has available about 200 grams of the widely analyzed Eimer and Amend $SrCO_3$.

There is some interest in a Rb-Sr reference sample of Precambrian age and a feldspar is available from Prof. L.L. Shanin (Institute for Geology of Ore Deposits, Akademija Nauk, Geochronological Laboratory, Staromonetny pereulok 35, Moscow J-17, U.S.S.R.). The feasibility of NBS-70a K-feldspar as a Rb-Sr reference has been discussed by Compston et al *(Geochim. Cosmochim. Acta,* v. 33 p. 753-757 (1969)). (From the 1969 Standards Committee report, it was believed that the U.S. Geological Survey may have collected the sample. However, the sample was shipped to the U.S. National Bureau of Standards directly by the Kingman Feldspar Mine, near Kingman, Ariz. (sec. 26, R. 17 W., T. 22 N., Sixth Standard Parallel

North). The mine is described by E. Wm. Heinrich in the *Univ. of Arizona Bull.*, v. XXXI, no. 1.).

A biotite reference sample is being distributed by Profs. F. Leutwein and Sonet (Centre de Recherches Petrographiques et Geochimiques, B.P. 682, Vandoeuvre-Nancy MM, France). The sample has a high rubidium content and about 2000 splits of the sample are available. They also have a phlogopite with a higher argon content that may be a good K-Ar reference sample. A manuscript on all Nancy samples (Roubault, M., de la Roche, H., and Govindaraju, K., "Report (1966-1968) on geochemical standards: Granites GR, GA, GH; Basalt BR; Biotite Mica-Fe; Phlogopite Mica-Mg.", *Sci. Terre* (Ann. Ecole Nat. Superieure Geol. Appl. Prospechon Miniere Univ. Nancy) was reported to be in press in late 1969. Rock analyses of the two micas and some trace element data have been published (Roche, H. de la, and Govindaraju, K.,"Les etalons analytiques de roches et de mineraux ou standards geochimiques du Centre de Recherches Petrographiques et Geochimiques de Nancy", *Soc. francais ceramique Bull.*, no. 85, pp. 31-33 (1969)).

The Centre de Recherches Petrographiques et Geochimiques in a release dated Feb. 20, 1970 gives the following data on the two micas:

	Phlogopite (Mica-Mg)	Biotite (Mica-Fe)
Rb total, ppm	1310	2213
Sr total, ppm	25	4.7
^{87}Sr, ppm	2.70	2.8
Age, m.y.	495 ± 15	305 ± 10

4. Whole-rock lead isotope reference samples and U-Th-Pb Analyses. Investigators in these studies (George Tilton of the Univ. of California, Santa Barbara; Stephen Moorbath of Oxford; Louis Nicolaysen of the Univ. of Witwatersrand; Virginia Oversby of the Australian National University; and Blenkensof of the Univ. of British Columbia) acknowledged the desirability of rock-lead reference samples and arrangements have been made to send them U.S. Geological Survey reference samples. Complete isotope dilution and isotopic abundance data on G-2 and GSP-1 have been published (raw values for G-2 and "absolute" values for GSP-1), in addition to U, Th, and Pb concentration data by M. Tatsumoto using isotope dilution for AGV-1 and BCR-1. (For concentration data, see *Geochim. Cosmochim. Acta*, v. 33, pp. 81-120 (1969); for isotopic data on G-2 and GSP-1, see U.S. Geol. Survey *Prof. Paper* 575-B, pp. B170-B177, B181-B186, (1967)). Reference samples and interlaboartory studies are essential to establish the levels of $^{207}Pb/^{204}Pb$ laboratory bias. The U.S. Geological Survey rock reference samples are unusually rich in lead and some are exceedingly high in Th/U. The Japanese samples, especially the basalt, should be investigated to determine if they are more normal in U-Th-Pb characteristics.

5. U-Th-Pb Dating. The Concordia age obtained from zircon dating agrees well with the Rb-Sr whole-rock isochron age (for a review, see Doe, B.R. and Pearson, R.C., U-Th-Pb chronology of zircons from the St. Kevin Granite, Northern Sawatch Range, Colorado, Geol. Soc. Amer. *Bull.*, v. 80, pp. 2495-2502 (1969)). However, recent tests by L.T. Silver and T.W. Stern show that there exists systematic laboratory bias on the order of 0.7% of $^{206}Pb/^{207}Pb$ (approx. 70 m.y. at 1,000 m.y. in age). A reference sample is needed to improve intercomparisons. A limited amount of a zircon from the Pocoima pegmatite (approx. 1,000 m.y. in age) is available from L.T. Silver, Division of Geological Science, California Institute of Technology, Pasadena, California, 91109.

Bruce R. Doe, Task Force Leader
Emilie Jager
Marvin Lanphere
Leon T. Silver
Thomas W. Stern

II. Microprobe standards. A.A. Chodos (Geological Sciences, California Institute of Technology, Pasadena, California, 91109) joined the Standards Committee in May 1970 to prepare for a 1971 task force that will consider all aspects of microprobe standards. Klaus Keil of the Univ. of New Mexico and Cornelius Klein, Jr. of Harvard have agreed to join him on the task force. Chodos has solicited ideas from the representatives to Probe Users Groups listed in *Analytical Chemistry* (v. 42, no. 5, p. 253R, April, 1970). Chodos made an announcement of the formation and purpose of the task force at the business meeting of the Electron Probe Analysis Society of America. The task force submitted an item for publication in the newsletter of the EPASA and requested that a similar announcement be included in the mailing for the coming EPASA elections. Chodos would appreciate information on the needs and availability of microprobe standards from all interested parties.

III. NBS glass-trace elements standards. The four new U.S. National Bureau of Standards glass standards made to contain the nominal amounts of 0.02, 1.0, 50, and 500 ppm of some 61 elements were issued under preliminary certificates dated August 5, 1970. Details of the processing, the elements added, a brief discussion of the certification, and prices are given in a release dated July 24, 1970 available from the Office of Standard Reference Materials, National Bureau of Stand-

ards, Washington, D.C., 20234. The certified and interim (in parentheses) values of trace elements published to date are tabulated as follows:

U.S. Nat. Bur. Std.	610	612	614	616
Std. Ref. Mat. No.	611	613	615	617
Nominal value	500 ppm	50 ppm	1 ppm	.02 ppm
Antimony	–	–	(1.06)	0.078
Barium	–	(41)	–	–
Boron	(351)	(32)	(1.30)	.20
Cerium	–	(39)	–	–
Cobalt	(390)	(35.5)	.73	–
Copper	444	37.7	1.6	.80
Dysprosium	–	(35)	–	–
Erbium	–	(39)	–	–
Europium	–	(36)	.99	–
Gadolinium	–	(39)	–	–
Gallium	–	–	(1.3)	.23
Gold	(25)	(5)	(1.5)	.18
Iron	458	51	(14)	11
Lanthanum	–	(36)	.83	.034
Lead	426	38.57	2.32	1.85
Manganese	485	39.6	–	–
Neodymium	–	(36)	–	–
Nickel	450	37.6	(.95)	–
Potassium	(461)	(64)	30	29
Rubidium	425.7	31.4	.855	.100
Samarium	–	(39)	–	–
Scandium	–	–	.59	.026
Silver	(254)	22.0	.46	–
Strontium	(519)	(78.5)	(46.1)	43
Thallium	61.8	15.7	.269	.0082
Thorium	455	37.55	.746	.025
Titanium	(437)	50.1	3.1	2.5
Uranium	461.5	37.38	.823	.0721
Ytterbium	–	(42)	–	–
Zinc	(433)	–	–	–

F.J. Flanagan, Chairman

Committee on Environmental Geochemistry:

Plans for several symposia and conferences are underway, including cosponsorship, with Woods Hole Oceanographic Institution, of one on Pollution in Natural Waters, and an OGD-sponsored full-day symposium on Organic Geochemistry and Environmental Pollution at the next GSA meeting.

In this connection, J.B. Thompson also reported as Geochemical Society delegate to the Council of the American Association for the Advancement of Science as follows:

A copy of the minutes of the AAAS Council meeting held in Boston, Massachusetts, on December 30, 1969, has been transmitted to the secretary of the Geochemical Society, together with pertinent supporting documents.

The matters of greatest interest to the Geochemical Society are in Item 4 of the Agenda, dealing with herbicides in Vietnam, and in Item 4 of the background materials presented by Gerald Holton on behalf of the Board of Directors, having to do with the quality of life and the environmental crisis. It was evident at the Council meeting that the concern of the active leadership of AAAS in these matters is intense and that further moves by AAAS in this direction may be anticipated in the near future. Inasmuch as the Geochemical Society contains a pool of considerable expertise on many aspects of these problems, the Geochemical Society Council and membership should be urged to give our newly formed Environment Committee full support and encouragement. If we do not play an active role many matters of concern to us may be taken over by well-meaning but less able hands.

J.B. Thompson reported for R. Siever, Chairman.

Ad hoc Committee on Awards:

Our discipline has grown remarkably since the beginning of the century, and has made many important contributions to human knowledge. Because of the interdisciplinary nature of our field, these contributions have often been recognized and honored by other scientific societies. Nonetheless, we cannot forever rely on other societies to encourage and reward outstanding work in geochemistry. Our society has grown large enough and mature enough to establish its own award system.

We propose that the Geochemical Society establish two awards: a senior award without age limit and a junior award with an upper age limit.

H.D. Holland
F.J. Flanagan
E. Anders, Chairman

REPORTS OF THE EDITORS

Geochimica et Cosmochimica Acta:

1. The journal is healthy, both technically and financially.

2. The *Proceedings of the Apollo 11 Lunar Science Conference,* totaling 2492 pages, was published and distributed free as Supplement No. 1 during the summer.

3. Air mailing of the journal from the printers to New York, from where they are then mailed to North American subscribers, has encountered unexpected difficulties. Because of certain technical difficulties, it has been necessary for the journals to go to London, before being sent to New York. (They cannot apparently be sent directly from Belfast). A solution to this absurd situation will be explored.

4. The high rejection rate for geochemistry papers of 40% continues, and is quite discouraging (and a drain on the editorial staff). Meteorite and cosmochemistry papers have only about a 10% rejection rate. Almost all papers require revisions of varying degree.

5. The inclusion of the journal as part of the annual dues will be implemented with the January, 1972, issue. (The subscription rate will remain $10.00 or equivalent for at least 5 years).

6. For the past few months close collaboration with the new Executive Editor, Prof. D.M. Shaw, has been in effect and I am pleased to advise Council that the transition has gone extremely smoothly. All manuscripts received before September 30th are being processed to publication from Calgary; those submitted since Oct. 1 have been sent to Prof. Shaw. I am confident the journal will flourish under Prof. Shaw's guidance.

A.A. Levinson, Outgoing Editor

Dr. Shaw proposed several changes, each of which was accepted by Council:

1. Four new Associate Editors: B.W. Evans, S.R. Hart, S. Moorbath, D.W. Spencer, and H.P. Taylor, Jr.

2. That the maximum length of paper be cut to 30 pages.

3. G.C.A. will not in future publish papers concerned with the compilation of standardisation of geochemical reference samples. The Standards Committee will be asked from time to time to prepare updated lists of recommended values both for North American and other reference samples (this should, of course, be transmitted to the Chairman of the Standards Committee by the Secretary).

4. Research fields acceptable for papers for *Geochimica et Cosmochimica Acta* will not be listed on the cover of the journal.

5. Obituaries for prominent geochemists who have had some connection with the Geochemical Society may be published in *Geochimica et Cosmochimica Acta* at the discretion of the Executive Editor.

6. In the light of the recent decision to include *Geochimica et Cosmochimica Acta* subscriptions in membership dues, Pergamon Press are to be asked to supply more rapid handling times for manuscripts and more speedy mailing for printed issues. The Executive Editor was instructed to do whatever he can to carry out these improvements.

D.M. Shaw, Incoming Editor

Journal Translations: By the date of the Council Meeting, the first number of the 1970 volume of *Geochemistry International* should have been published and distributed and the second number should be in press. Translations of *Geokhimiya* Nos. 5, 6, and 7 are in various stages of editing and composition. Thus, although the attainment of the goal of a six-month time lag between the Russian original and the published translation still eludes us, the time lag has been reduced to about eight months,

the shortest since the inception of the *Geokhimiya* translation program. In addition to the cover-to-cover translation of *Geokhimiya* during the 1969 volume year, 20 selected articles (12 Russian, 1 German, 4 French, 2 Italian, and 1 Hungarian) were translated and published.

Subscriptions to the 1969 volume (617) remained about the same as that to the 1968 volume (614*):

Subscribers to *Geochemistry International*
(as of August, 1970)

U.S.			272
Canada	48		
P.U.A.S.**	18	Total	
Europe	142	Foreign	345
Other	137		
		TOTAL	617

*Inadvertently shown as 617 in last year's report.
**Postal Union of the Americas and Spain.

I regret to report that the financial picture this year is no brighter and, if anything, worse than it was last year. The National Science Foundation apparently is maintaining its stance on terminating its support of the AGI and *all other* translations programs within the next few years. *Geochemistry International* is about 60% self-supporting from subscription revenues. At this writing, the fate of AGI's translations program for the (volume) year 1971 is unknown. Obviously, the next year or two will be critical ones, and I am sure that the Council will want to consider this very urgent question of possible financial crisis, should NSF terminate its support.

In closing this short, rather pessimistic report, I wish to thank all members of the Society who have assisted me with the editing chores. I am especially indebted to Dr. L. Paul Greenland, who once again assumed my editorial duties during the field season.

Robert I. Tilling

Book Translations: Things have been going slowly, but we hope to pick up speed from here on in. At this reading, an NSF proposal to support topical monograph production should be in the hands of the President, or close to it. This proposal is to provide finishing costs for the current *Geochemistry of Natural Waters* monograph and fund literature search and review for at least 2 more monographs in the next two years, plus accumulation of materials for other later ones.

The *Geochemistry of Natural Waters* monograph is either translated and in hand, or out for translation, and editing by volunteer subeditors and Committee members should begin in December. We hope to have the finished manuscript in the publisher's hands (Princeton University Press) by late summer, 1971. This time around volunteer editors, translators, and the Committee will have handled the whole job at no cost to the Geochemical Society, but we must allow for subsidy for the translating, at least in part, and preliminary editing in the future. One must anticipate the selfless sacrifice of our valued volunteers will burn out. Their contributions have, we hope, demonstrated the support our efforts have received and have gotten things rolling until NSF or other funding can take over. No-cost translation sources should be tappable for at least a part of future monographs, however.

Two new members with excellent competence in Russian literature have been added to the Committee, replacing Sol Silverman and Raymond Siever, whom we thank for their service. We welcome Abraham Lerman, Canada Centre for Inland Waters, Burlington, Ontario, and James W. Clarke, U.S. Geol. Survey, Washington. We are particularly obliged to Jim Clarke for agreeing to this assignment in spite of heavy duties as Editor of *Geologiya Nefti* (in translation) and *Geophysical Abstracts.*

While topical monographs are being prepared, Earl Ingerson has maintained efforts at seeing cover-to-cover translations come to print. *Rhenium,* by Ivanov et al. (1979) is being issued through *International Geology Review,* and work on Vernadsky's *Chemical Structure of the Biosphere of the Earth and its Environment* is proceeding. As a matter of incidental intelligence, another volume by Vernadsky is being prepared by Irving Breger and Leonard Shapiro, under contract with MIT press. These volumes will mark the first time works by the father of Russian geochemistry have appeared in English.

Frank T. Manheim

MISCELLANEOUS REPORTS

Organic Geochemistry Division:

The following are the new officers for the Division:

Keith Kvenvolden, Chairman
Richard D. McIver, Chairman-elect
Ellis Bray, Secretary

The Division now has 350 members, 30 more than last year. It has issued 3 newsletters in 1969, including the current bibliography of 40 members; these will be updated from time to time. The Division is planning a symposium on Organic Geochemistry and Environmental Pollution at the 1971 GSA meeting.

Representative on the U.S. National Committee on Geochemistry: D. Wones reported that the U.S. National Committee has finally drafted its constitution. The Geochemical Society is to have three representatives. Council will make these selections through correspondence.

Jointly-Sponsored (GS-ACS) Symposia in New Orleans: G. Allen (Convenor) reported on the symposia, Problems in Analytical Geochemistry, and General Geochemistry, to be held December 2-4, 1970 in conjunction with the American Chemical Society meeting. The abstracts for these papers will be printed only in the program of the meeting, but these programs will be available for $3.00 from Dr. Mary L. Good, Department of Chemistry, Louisiana State University in New Orleans, Lake Front, New Orleans, Louisiana, 70122.

Chemical Abstracts: M. Fleischer reported on the coverage of section 53 of *Chemical Abstracts* and made a plea for reader's comments on the problems facing him. The number of abstracts in this section, per year, has gone up as follows: 1954-1800; 1959-3600; 1965-5600; 1968-5986; 1969-6919; 1970 (predicted)-8900. Something will *have* to be done to reduce this continued growth in abstracting, and Fleischer asked that these decisions not be made in a vacuum. Several possible shifts that might be considered are:

1. Shift the burden within *Chemical Abstracts* itself by placing items normally abstracted in section 53 into related sections (such items as coal, petroleum, inorganic chemistry of soils, etc.)
2. Cut coverage of border line areas. (At present straight petrography is not abstracted, but if even one analysis is given, it is abstracted).
3. Cut coverage of economic geology (eliminate items on small uneconomic deposits, etc.)

Fleischer wants *concrete* suggestions from the readers. One very useful procedure would be for the reader to take any given copy of section 53 and state to Fleischer or coeditor Angino, what specific abstracts he believes *should be completely omitted.* (Obviously, there will be many abstracts that are of no interest to a given reader but should be in for others). Here is a way in which the members of the Society can help out in maintaining the usefulness of this unexcelled abstracting service. *Now* is the time to act. (This free advertising plug was inserted by the ex-Secretary).

Relations with Association of Exploration Geochemists: As an appreciable segment of the members of the Geochemical Society (26%) have expressed an interest in the general field of applied geochemistry (including trace elements in environments, and geochemical exploration); there was some discussion in Council as to what should be the relationship between these two societies. There are differences in orientation and membership requirements that make any affiliation difficult, but the possibility of some sort of cooperation will be pursued.

COUNCIL ACTIONS

Secretary's Report:

The minutes of the previous meeting, as distributed to Council by mail, were approved.

Treasurer's Report:

Council voted to accept the Treasurer's report, including the recommendation that the Society withdraw their mailing and addressing service from AGI (with the timetable and other details to be worked out later).

A motion was passed to change theBy-Lawsconcerning time for dues payments and delinquency (see By-Laws).

In view of the difficulties the Treasurer has had in identifying the exact nature of the services rendered, a motion was carried to instruct the Treasurer that he was not authorized to pay any charges without an itemized bill.

A motion was passed that the Society will not increase its payment to AGI from $1.00 to $2.00 per stipulated member. This matter of an increase will be reconsidered when the AGI revamps its procedures for assessing member Societies so that they are more equitable across the board.

V.M. Goldschmidt and F.W. Clarke Awards:

Council voted to establish two awards. Specifications have been incorporated into By-Law VIII of the Society and are published in this issue under that heading.

Council appointed a Medal Design Committee consisting of B. Hanshaw and R.I. Tilling, who will submit appropriate designs to Council.

Geochimica et Cosmochimica Acta:

Council approved the recommendations of Dr. D.M. Shaw, the incoming editor, as published under reports of the editors.

Change in Nominating Committee procedure:

H.D. Holland suggested a change in the By-Laws covering the Nominating Committee (see By-Laws) that was accepted by Council.

CONSTITUTION AND BY-LAWS OF THE GEOCHEMICAL SOCIETY AS REVISED, NOVEMBER, 1970

Constitution

I. The Society shall be known as the Geochemical Society.

II. The object of the Society shall be to encourage the application of chemistry to the solution of geological and cosmological problems.

III. 1. The officers of the Society shall be a President, a Vice-President, a Secretary, a Treasurer and an Executive Editor. The President and the Vice President are to be elected annually by a plurality of those voting. The Secretary, the Treasurer and the Executive Editor are to be elected on the basis of a plurality of the votes cast to serve terms of three years; the Secretary and the Treasurer shall be eligible for election to not more than one consecutive term of three years. The Executive Editor shall be eligible for election to more than one consecutive additional term.

2. There shall be an executive council, to be composed of the above officers, the retiring president, and six other members of the Society, who shall be elected for terms of three years each.

IV. 1. There shall be only one type of general membership. All members shall be entitled to vote on all matters, including elections of officers, that are considered by the Society.

2. Any person of good character and unchallenged basic scientific integrity and honesty, regardless of sex, nationality, residence, employment, prominence or proficiency, may become a member providing only that he or she:

a) will subscribe to the declared purposes of the Society, and

b) can evidence a general understanding of the field of endeavor by at least a Bachelor's Degree in one of the following fields: physical science, biological science, mathematics, or engineering; or by three years or more of activity in any of these disciplines (including teaching, research, application, bibliographic and editorial service).

V. Amendments to the constitution may be proposed to the Council by any 25 members. The Council shall indicate whether it approves or disapproves, but in either case they shall be submitted to the members for mail ballot. The amendment is accepted if approved by two-thirds of those voting on it.

By-Laws of the Geochemical Society

I. Effective January, 1972, the annual dues of all members shall be fifteen dollars (U.S. $15.00, or equivalent in other acceptable currency), one dollar of which shall be paid by the Society to the American Geological Institute. All members shall receive the monthly journal *Geotimes* from the Institute. In addition, ten dollars ($10.00) of the dues shall be paid by the Society to Pergamon Press, for which the members shall receive the monthly journal *Geochimica et Cosmochimica Acta.* Memberships are to run for calendar years. Dues notices for the forthcoming year will be mailed on or about October 1, and payment must be in the hands of the Treasurer by the following January 31 or the member will be dropped from the rolls. Reinstatement during that calendar year will require payment of a reinstatement fee of U.S. $3.00 in addition to the $15.00 dues.

II. 1. The duties of the officers shall be the usual ones performed by such officers. The President, Secretary, Treasurer and Executive Editor shall make annual reports to the Society.

2. The Executive Council shall direct all affairs and activities of the Society, including the expenditure of its funds. In

the event that executive action must be taken in the absence of a quorum of the Executive Council, the President may convene a committee of three officers as an "emergency executive committee". The members of such an "emergency executive committee" shall be the President, the Treasurer, and Secretary; if one of these is not available to attend, the President may appoint some other member of the Executive Council to act in his stead. Such an emergency executive committee shall have the power to act on behalf of the Executive Council in all matters, but each of its actions is subject to ratification or review by the Executive Council at its next meeting following such action, or by mail if necessary. In meetings of the Executive Council, a quorum shall consist of the President, the Secretary or Treasurer, one of the other officers (Vice-President, Executive Editor, or Past President), and three of the Councillors.

3. The President shall appoint, with the approval of the Council, such committees as may be needed to further the objects of the Society. These shall include a Nominating Committee and a Program Committee. The Nominating Committee shall consist of six members, not more than one of whom shall be a member of the Council, to serve three-year terms. The Chairman shall be chosen from one of the members of the committee for the preceding year, and shall cast the deciding vote in case of ties.

   The Program Committee shall consist of three members, each appointed for a three-year term, plus the Secretary, serving ex-officio. They shall, operating under policies laid down by the Council, make arrangements for the program of the annual meeting and shall cooperate with other societies having programs of interest to this Society.

4. The Executive Editor shall have full responsibility for the official journal of the Society. He can appoint, with Council approval, an appropriate number of associate editors, representing areas of active geochemical and cosmochemical research and interest. Terms of the associate editors expire with the term of the Executive Editor or with his resignation and they may, with Council approval, be reappointed for additional terms.

III. Nominations for office shall be made by the Council, one nomination for each office, with due consideration of the recommendations of the Nominating Committee. The nominations shall be made known to the members at least eight months prior to the next annual meeting, at which time the new officers are to take office. Other nominations may be made in writing by any ten members; these nominations, and the nominee's acceptances, must be in the hands of the Secretary at least five months before the annual meeting. If no other nominations are received by that date, the Council slate shall be considered elected and no ballots will be sent. If other nominations are received, ballots carrying all nominations, in alphabetical order and without distinction between those of the Council and any others shall be distributed to the members. Election shall be on the basis of a plurality of the votes cast. The elected officers shall enter on duty at the adjournment of the next annual meeting.

IV. The Council shall have the authority to arrange for affiliation or association with other scientific societies, and the president shall, with the Council's approval, appoint representatives to such organizations.

V. There shall be an annual meeting of the Society, to be held, whenever practicable, at the same time and place as that of the Geological Society of America, and such other meetings as may be called by the Council.

VI. Amendments to the By-Laws shall be made by the Council and the membership notified. Any twenty-five members may petition the Council for a referendum on any such amendment or other action of the Council; such a question shall be submitted to the membership by mail ballot and must be approved by a majority of those voting on it to be accepted.

VII. Nominations for the post of the Executive Editor shall be made by an ad hoc Nominating Committee consisting of the regular six-member Nominating Committee plus a representative of the Meteoritical Society, to be selected by that Society.

VIII. 1. There shall be two awards as follows:
   a) V.M. Goldschmidt Medal. This award, consisting of a gold medal and a certificate, shall be awarded for major achievements in geochemistry or cosmochemistry. Such achievements may consist either of a single outstanding contribution, or of a series of publications that have had great influence on the field. The Goldschmidt Medal is normally given annually, but may be omitted in a given year at the discretion of the Council.
   b) F.W. Clarke Medal. This award, consisting of a bronze medal and a certificate, shall be awarded to a young scientist for a single outstanding contribution (ordinarily a single paper) to geochemistry or cosmochemistry, normally published within 5 years of completion of his formal studies. Independence and originality shall be important criteria. The Clarke Prize is normally given annually, but may be omitted in a given year at the discretion of the Council.

   2. There shall be two Awards Committees, one for each award, and each consisting of three members to be appointed by the President for staggered 3-year terms. The member whose term is closest to expiration shall be appointed by the President to serve as Chairman. The Chairman's vote is decisive in case of ties. Membership of the Committees shall be broadly representative of the range of interests of the Society. At least one member of one of these two committees shall be from outside North America.

   3. The Awards Committees shall solicit nominations from the membership and seek out suitable candidates on their own. They shall select a first and second choice for each award and present them, with adequate documentation, to the Council eight months prior to the Annual Meeting. Council shall then make the final choice between the nomina-

tions, or vote not to make an award in a particular year. Awards are normally not shared, except in highly unusual cases such as independent discoveries or joint work where the contributions of the co-authors are essentially equal.

All duly documented nominations considered by the Committees remain active for a total of 3 years, unless the candidate becomes disqualified on grounds of appointment or election to Council, or ineligible by the passage of time.

Current council members and past recipients of the same award are ineligible. Except for the time limit of the Clarke Medal, there shall be no other restrictions on eligibility. Neither citizenship, nor membership in the Society shall enter into consideration.

The Committees shall have the responsibility for arranging for appropriate citations for each award, and for arranging for suitable publicity for the awards, e.g., in *The Geochemical News.*

The Society shall reimburse travel expenses of award recipients only in exceptional cases, as determined by the Council.

ORGANIC GEOCHEMISTRY DIVISION

Will all members of this division who did not receive, during the last year, copies of the OGD Newsletter, please indicate this fact to E.E. Bray, Secretary OGD, Mobil Research & Development Corp., P.O. Box 900, Dallas, Texas 75221. By this means the OGD can update its Newsletter mailing list to insure that all of its members are receiving the value of membership.

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PRIORITIES FOR NEW STARTS, 1971-1980, recommended to the Office of Space Science and Applications, National Aeronautics and Space Administration

	BASE MISSIONS[1]	INTERMEDIATE-BUDGET PROGRAM MISSIONS[2]	HIGHER-BUDGET PROGRAM MISSIONS[3]
PLANETARY EXPLORATION	**PLANETARY EXPLORERS:** Venus atmospheric probes and orbiters, and possibly surface science; four missions tentatively proposed. **JUPITER MISSIONS:** Jupiter atmospheric probe, orbiter, or possibly fly-by to Saturn; not essential if higher-level program including Grand Tour is funded.		**SOLAR ELECTRIC MERCURY ORBITER:** Mercury fly-by in late 1970s; solar electric propulsion. **GRAND TOUR (TOPS):** Grand Tour with Thermoelectric Outer Planets Spacecraft (TOPS) takes advantage of unusual planetary alignment for studies of Jupiter, Saturn, Uranus, Neptune, and Pluto; important planetary observations; high-cost program. **HELIOSPHERE/INTERSTELLAR MISSIONS:** Pioneer-class spacecraft to explore out of ecliptic, if Grand Tour (TOPS) is abandoned.
LUNAR MISSIONS	**AUTOMATED LUNAR AND PLANETARY LANDERS:** Development of remote-control and sample-return technology for ultimate application to lunar and planetary exploration.		**LUNAR ORBITER:** Dual-vehicle (low-orbit and high-orbit) missions for gravity and magnetometer measurements.
ASTRONOMY[4]	**HIGH ENERGY ASTRONOMICAL OBSERVATORY (HEAO):** First major opportunity for use of advanced instrumentation for x-ray, gamma-ray, and cosmic-ray exploration. **SMALL ASTRONOMICAL SATELLITES (SAS):** For short lead-time response to rapidly developing new areas of astronomy. Exploratory vehicle for new scientific areas and instrumentation; not substitute for advanced observatories. **ASTRONOMY ROCKETS, BALLOONS, AND AIRCRAFT:** Rockets for ultraviolet, infrared, and x-ray observations above absorbing atmosphere; balloons for hard x-ray, gamma-ray, and cosmic-ray studies; aircraft for infrared observations. Double support for rockets, balloons. **MIRROR TECHNOLOGY FOR LARGE SPACE TELESCOPE (LST):** LST mission is deferred to 1980s because of its total cost, but is important to fundamental science and development of technology for 3-meter-aperture LST mirror requires long lead time. Immediate start is needed on technology for 1.5-meter mirror for space telescope in intermediate program.	**1.5-METER SPACE TELESCOPE:** Optical observations of far galaxies; intermediate step to major instrument goal of 3-meter-diameter mirror. **ORBITING SOLAR OBSERVATORIES (OSO) L, M:** For solar-physics studies; should be flown in next high-activity phase of solar cycle.	**SOLAR OBSERVATORY (1 ARC SEC):** Studies of solar activity and coronal heating. **KILOMETER WAVE ORBITING TELESCOPE (KWOT):** Observations at long radio wavelengths.
GRAVITY PHYSICS	**EARTH-ORBITING GYROSCOPIC EXPERIMENT AND ESRO SUN-ORBITING SATELLITE:** Development of technology for flight, for gravity and general-relativity studies. Earth-orbiting gyroscope experiment under development at Stanford University; ESRO sun-orbiting satellite expected to be proposed for NASA support by European Space Research Organization.		
SOLAR-TERRESTRIAL PHYSICS	**IMP KK' AND SOLAR-TERRESTRIAL PROBE A:** Coordinated observations from different positions for studies of magnetospheric behavior and interaction of solar wind and outer boundary of magnetosphere. **ROCKETS AND BALLOONS:** Polar-cap and auroral-zone studies. **DATA ANALYSIS:** Doubling of funds for analyzing data already in hand and for adequately using data from future missions.	**ATMOSPHERIC EXPLORERS (AE) F AND G:** Aeronomy studies. **CLUSTER A AND B:** Three-dimensional space measurements for studies of solar wind and magnetosphere.	**ELECTRODYNAMIC EXPLORER:** Studies of electrodynamic coupling between ionosphere and magnetosphere. **SYNCHRONOUS EXPLORER:** Magnetosphere studies. **PLASMAPAUSE EXPLORER:** Plasmapause physics. **NEUTRAL POINT EXPLORER:** Studies of solar wind and magnetosphere at or near neutral points.
EARTH OBSERVATIONS	**EARTH OBSERVATORY SATELLITES (EOS):** Research satellites for applications including meteorology, earth-resources surveys, hydrology, and ecology. **SMALL APPLICATIONS TECHNOLOGY SATELLITE (SATS):** Short lead-time craft for rapid work on new approaches to meteorological and earth-resources programs. **SATELLITE TO SATELLITE TRACKING:** Studies of gravity anomalies, mantle convection. **EXPANDED DATA ANALYSIS FROM AIRCRAFT SURVEYS FOR EARTH RESOURCES:** Expansion of data analysis for development of operational flight programs.	**EARTH RESOURCES SATELLITE (ERS):** Prototype development; NASA obligation to user agencies. **SYNCHRONOUS EARTH OBSERVATIONS SATELLITES (SEOS)** Meteorological studies of rapid cloud motions and atmospheric dynamics. **EARTH PHYSICS:** Development of satellite to measure sea-surface height with high accuracy.	**RECOVERABLE EARTH RESOURCES SATELLITES:** Satellites from which film may be recovered should be flown simultaneously with standard telemetered ERTS to obtain coverage of same area.
LIFE SCIENCES	**EXOBIOLOGY:** Adequate ground-based research relevant to exobiology missions.	**SPACE BIOMEDICINE:** Broad program of laboratory research to qualify man for space missions. **LIFE SCIENCE IN SPACE:** Exploit opportunities to accommodate life-science experiments where ongoing missions permit.	**IMPROVED BIOSATELLITE:** Extensive ground-based research prior to definition of payload for new-generation satellite system for basic biological studies in space.

SOURCE: "Priorities for Space Research 1971-1980," Space Science Board, National Academy of Sciences—National Research Council.

NOTES: [1] Base missions identifies new starts that with existing programs of key importance are necessary to viable space science and applications program for the 1970s. Estimated cost of base missions plus currently approved missions is close to fiscal 1971 OSSA budget.

[2] Intermediate-budget program includes base missions and several other low-cost, high-priority new starts. It would add approximately 25 percent to level of effort represented by fiscal 1971 OSSA budget.

[3] Higher-budget program includes base and intermediate programs except as noted plus additional missions that would increase level of effort by as much as 50 percent over that represented by fiscal 1971 OSSA budget. It is intended as a relatively broad-gauged and balanced program of scientific exploration and practical use of space for earth observations.

[4] Assumes that Office of Manned Spaceflight will continue to support Apollo Telescope Mount, which is coupled to Skylab 1.

MAILING OF ISSUE NUMBER 52

As in the past AGI mailed issue Number 52 of *The Geochemical News* for the Society, by affixing gummed labels to the envelopes. Unfortunately, in addition to the numerous errors and omissions which AGI has failed to correct in their version of our mailing list in spite of repeated reminders from the Treasurer, many of the labels were unsatisfactory. In several cases the labels were cut apart in the wrong places, resulting in mailings to persons with no city, state, or country in evidence. I have at hand now a returned undeliverable copy; at the top is "Quito, Ecuador" and at the bottom the name of a member in England. Some labels fell off, etc. etc.

IF YOU DID NOT RECEIVE A COPY, please write the Editor at the address on the last page; an extra copy will be sent promptly. A post card will do.

Paul L. Cloke, Editor

CHANGES IN SERVICE

Perhaps most important the Society is no longer using AGI for mailings. We anticipate far fewer problems in the future in respect to changes of address, failure to stop sending notices in case of resignations, etc. Mailing labels of high quality are now being printed when needed by an independent computer company in the Washington area. The *News* will be mailed by printing a bulk mailing permit and return address on the last page and affixing these labels directly to the issue: this service and the mailing will be done by the firm printing the *News*, thereby saving transportation time and expense to Washington. In addition we expect the mailing itself to require far less time.

In anticipation of this improved service I have carefully reviewed all changes of address, etc. of which I have been notified and have published, either in issue No. 52 or this issue, all the changes and additions not already made in the Membership List of June, 1970. Thus, the combination of the Membership List and issues Nos. 52 and 53 should provide an accurate complete coverage of the membership through early February, 1971. IF YOUR ADDRESS AS PUBLISHED IN ONE OF THESE THREE PUBLICATIONS IS INCORRECT OR MISSING, PLEASE NOTIFY THE EDITOR. IF IN ADDITION ISSUE NO. 52 WAS MISADDRESSED, *PLEASE NOTIFY INSTEAD THE TREASURER,* Dr. Bruce B. Hanshaw, United State Geological Survey, Washington, D.C. 20242, U.S.A., who will in turn notify me. Many of the changes in these two issues have been published previously in the *News*, but were not recorded by AGI. This has been the source of great annoyance to some of our members.

Over the past few years it has become increasingly difficult because of the priorities which have had to be established within the University of Michigan to get copy for *The Geochemical News* prepared quickly. With this issue, therefore, the final copy is being prepared by the printing company. To offset most of this increased cost, smaller type size and narrower margins are being used. Many may find this less attractive and harder to read, but the reduction in preparation time from three months, as for issue No. 52, to two or three weeks appears to justify the change. Because this firm will also do the mailing without the use of envelopes, the total costs may be less than previously. Suggestions for further improvements are welcome.

Paul L. Cloke, Editor

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PREVIOUSLY UNPUBLISHED ADDRESSES

(For reasons that are not immediately apparent several names and addresses have not been published either in the latest - June, 1970 - membership list or in *The Geochemical News,* No. 52. Some of these have, however, been published in earlier issues of the *News* and should have been in the membership list.)

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The abstracts published in Sec. 53 in volumes 72 and 73 in 1970 totalled 9045, an increase of 2126 or 30.7%, both the total and increase representing startling new highs. Part of this was due to the publication of abstracts of papers of the Apollo conference and part to publication of a backlog of large Russian symposia; these are estimated to account for about one-third of the increase.

The increased burden on the editors has had the inevitable consequence that the editing cannot be as thorough as we like. It has also raised the question as to whether we should not tighten our criteria for deciding whether a given paper is worth abstracting. It should be emphasized that such decisions are being made largely by the editors and are not imposed by *Chemical Abstracts*. We are handicapped by an almost complete lack of information as to how many use Sec. 53 and in what ways. We therefore request urgently that all members write to either of us telling us: (1) do you use Sec. 53? (2) do you instruct students in its use? (3) is there any part of Sec. 53 that you do not use? In connection with (3) it would be very helpful if you would go over carefully any one recent issue and simply list the numbers of the abstracts therein which in your judgement might well have been omitted. Please help!

Table 1 shows that the speed of coverage, still far better than that of any comparable abstract journal, was slightly slower than in preceding years, probably because of the huge increase in Russian publications and the coverage of a back log of Russian symposia.

Table 2 shows the distribution of papers abstracted for the leading countries. The most noticeable change is the very large increase in papers from the USSR. It should be noted that in 1970, as in the past few years since the supply through Russia was cut off, not a single abstract was published for papers from mainland China.

Thanks are due to the abstractors and to the staff at Columbus whose untiring and excellent work makes this service possible. Your suggestions are welcome; none was received during 1970.

Michael Fleischer
E.E. Angino

Table 1. -- Year of abstract compared to year of issue of papers, Sec. 53 (by percentage of total)

	1970	1969	1968	1967	1966
Total no. abstracts	9045	6919	5986	6164	5633
Dated					
1. same year	32.0	35.9	37.9	35.2	36.7
2. 1 yr. earlier	47.3	47.9	44.8	50.3	48.0
3. 2 yrs. earlier	17.1	12.7	15.8	10.6	11.9
4. 3 yrs. earlier	2.6	3.2	1.3	2.1	2.5
5. > 3 yrs. earlier	1.0	0.3	0.2	1.8	0.9
1 + 2	79.3	83.8	82.7	85.5	84.7

Table 2. -- Country of origin of papers abstracted in Sec. 53 (leading countries)

	1970		1969		1968	
	No.	%	No.	%	No.	%
USSR	4227	46.7	2621	37.9	2417	40.4
USA	1514	16.7	1334	19.3	981	16.4
Germany (W & E)	318	3.5	365	5.3	301	5.0
France	297	3.3	260	3.7	208	3.5
Canada	270	3.0	236	3.4	167	2.8
Great Britain	262	2.9	208	3.0	185	3.1
Japan	236	2.6	218	3.2	180	3.0
Australia	198	2.2	145	2.1	149	2.5
India	179	2.0	184	2.7	145	2.4
Italy	138	1.5	111	1.6	116	1.9
All others *	1406	15.6	972	14.0	857	14.3
	9045	100.0	6919	100.0	5986	100.0

* 86 countries in 1970

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CALENDAR

September

9 - 11	Petrologic crystal chemistry, conf. by AGU's Volcanology, Geochemistry & Petrology Section; Edgartown, Mass. (Conference on Petrologic Crystal Chemistry, American Geophysical Union, 2100 Pennsylvania Ave. NW, Washington, D.C., 20037)
15	Symposium on The Geochemical Cycle of Trace Metals in our Environment, Washington, D.C. (C. Ellen Gouter, Cyrus Wm. Rice Div., NUS Corp., 15 Noble Ave., Pittsburgh, Pa. 15205)
21 - 23	Intl. conference on engineering in the ocean environment, San Diego. (Maurice Nelles, Bissett-Berman Corp., Box 1447, San Diego, Calif., 92112)
21 - 24	Society of Mining Engineers, fall mtg., Seattle. (J.C. Fox, AIME, 345 East 47th St., New York, 10017)
22 - 26	Canadian exploration frontiers, symposium in Banff, Alberta, by Alberta Society of Petroleum Geologists. Field trips. (J.R. Malcolm Berry, Canadian Industrial Gas & Oil Ltd, 640 8th Ave. SW, Calgary 2)

October

4 - 6	Geochemical environment in relatinn to health & disease, conference in New York City. (L.R. Neville, New York Academy of Sciences, 2 East 63rd St., New York)
16 - 17	Groundwater pollution conference, St. Louis, Missouri. (Groundwater Pollution Conference, Underwater Research Institute, 3411 Hampton Ave. Suite 202, St. Louis, Mo. 63139)
18 - 21	Materials research symposium, solid-state chemistry, Nat'l. Bureau of Standards. (R.S. Roth, B214, Bldg. 223, Nat'l. Bureau of Standards, Washington, D.C., 20234)
18 - 22	Mining Pribram symposium, by Czechoslovak Scientific & Technical Assn., with section on mathematical geology; Pribram, near Prague. (Secretary, Mining Pribram)

November

1 - 3	Geological Soc. America, ann. mtg., Washington, D.C. (GSA headquarters, Box 1719, Boulder, Colo., 80302)
1 - 3	Geochemical Society, ann. mtg., Washington, D.C. (Dr. Ernest Angino, State Geological Survey, Univ. of Kansas, Lawrence, Kansas 66044)
5 - 7	Genesis of base-metal deposits in Ireland, symposium by Irish Geological Assn., Galway. (D. Skevington, Geology Department, University College, Galway, Ireland)
8 - 9	Remote sensing of Earth resources & the environment, seminar, North Hollywood, Calif. (Society of Photo-optical Instrumentation Engineers, Box 288, Redondo Beach, Calif., 90277)
15 - 19	Space for Mankind's Benefit, congress in Huntsville, Ala. (Huntsville Assn. of Technical Societies, Box 1266, Huntsville, Ala., 35807)

December

6 - 9	American Geophysical Union, nat'l. fall mtg., San Francisco. (AGU, 2100 Pennsylvania Ave. NW, Washington, D.C., 20037)
26 - 31	American Association for the Advancement of Science, ann. mtg., Philadelphia. (D.W. Thornhill, AAAS, 1515 Massachusetts Ave. NW, Washington, D.C., 20005)