The Third Denver Meeting: A Report

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The 128th meeting of the American Association for the Advancement of Science—the first meeting the AAAS has ever held in the Rocky Mountains area in the winter time—pleasantly surprised many program arrangers by the size of the attendance. Though there is no other large city within 500 miles of Denver, though a large majority of the registrants were from outside the metropolitan area, and though some people expected Denver to be snowbound, this was the sixth largest meeting in the long history of the Association.

The final count indicated 4709 paid registrations. Additionally, there were over 500 registrations of exhibitors, press representatives, and guests, and several thousand people attended sessions, principally in the evenings, without registering. Only the last three meetings in New York (1949, 1956, and 1960), and one each in Washington (1958) and Chicago (1947), have been larger.

Between World Wars I and II, just five AAAS meetings had 3000 or more registrants. Of the 17 meetings since Washington meeting of 1924, with 4206 registrants. Of the 17 meetings since 1945, 11 have exceeded 3000 registrants. The five larger than Denver were the Chicago meeting of 1947 (with 4940 registrants); the 1949 and 1956 New York meetings (7014 and 5327, respectively); the 1958 Washington meeting (5368); and the 1960 New York meeting (7389).

The seventh Chicago meeting of 1959, with 4636 paid registrations, was exceeded by 73.

Mere size, however, is not the only criterion of a successful meeting. The third Denver meeting was especially noteworthy for the caliber and variety of its programs, for the smoothness of its operation, and for the unaffectedly pleasant and hospitable attitude of the registration and hotel personnel, and others, with whom the delegates came in contact. The work of the local committees was outstanding, not only in effectiveness but in the degree of warm personal interest. And the weather, too, lived up to the optimistic predictions made months earlier: Except for one ephemeral snow squall that momentarily dampened the pavements early in the afternoon of 26 December, there was no precipitation during the meeting period; the skies were generally sunny, and daytime temperatures were mild.

The exhibitors were pleased with the number of teaching scientists who saw the displays of their books, instruments, and laboratory materials. With foresight and confidence they had engaged all available booth space some months in advance of the opening day. The exposition included some very interesting technical industrial displays, especially in such fields as electronics, telephony, aeronautics, mining, and petroleum chemistry.

Though the factors responsible for a successful scientific meeting—from attendance and financing to press and network coverage locally, nationally, and internationally—are numerous and complex, those that are basic invariably include the excellence of the programs; adequate advance information in *Science* and in cooperating scientific journals; adequate and convenient physical facilities; complete plans, and their execution by a devoted staff; and, not least, the effective work of truly interested local committees. The third Denver meeting enjoyed all of these in full measure and other favorable conditions as well.

The author is associate administrative secretary of the AAAS.

Premeeting Notices

Meetings cannot be well attended unless information on the programs is available well in advance. A preliminary announcement of the current year's AAAS meeting appears in *Science* each May. Synopses of the programs of the sections and participating societies are given, as far as they are known, at that time. In late July additional program notes and data on headquarters hotels are released. Usually, however, it is not until fall that more complete information can be supplied. The flow of hotel room reservations indicates that this is when many decisions on attendance are made or confirmed.

In 1961, the series of releases on the programs of the meeting that appeared in *Science* from 28 October through 8 December benefitted greatly from the ideas and writing of staff member Louise Campbell. Announcements in other journals also helped to bring people to the Denver meeting. The Association is indebted to the following for space in which to call attention to the AAAS meeting: the AIBS *Bulletin*, the ASB *Bulletin*, and the *Proceedings* of the Federation of American Societies for Experimental Biology. Societies that participate, such as the American Society of Zoologists and the Ecological Society of America, carry abstracts of their own papers; the Geological Society of America's *Bulletin* most cooperatively and adequately prints full details of Section E's geological sessions; finally, the secretaries of the sections and other program arrangers send program details to *Physics Today*, *Chemical and Engineering News*, and other appropriate journals. It seems quite safe to say that the meeting of no other scientific society receives so much cooperation from the journals of its affiliates and colleagues.

Pattern of the Meeting

The pattern of the meeting was a factor in its success. From the time it was formed, in 1955, the Association's Committee on Meetings has devoted much thought to the best arrangement of the general events, the interdisciplinary symposia, and the evening lectures. The section secretaries now meet jointly with the committee early in the year and often reflect the needs and views of the participating societies. The pat-

tern evolved over the past few years uses the parts of the day to best advantage, uniquely stimulates communication among scientists of diverse disciplines, and provides up-to-the-minute symposia that science teachers at all levels find of real assistance. The distribution of the four Moving Frontiers of Science lectures on the first evening and third afternoon, the placement, concurrently, of the four interdisciplinary symposia on the morning of "AAAS Day," 28 December, and the sequence of the special sessions—all facilitated the scheduling of programs of appropriate length in two 2-day blocks (26–27 and 29–30 December) by the sections and societies. The results were less demand for session rooms on one or two peak days in the middle of the meeting period, fewer conflicts between programs of interest to the same potential audience, and, in general, more time for people to see each other.

The Denver meeting's total of 342 sessions, summarized in Tables 1 and 2, included programs sponsored by the Association as a whole, by 17 AAAS sections, by two AAAS committees, by three recurrent conferences, and by 35 societies that had arranged programs varying from one to 26 sessions in length. In addition, 52 other participating organizations officially cosponsored appropriate programs of the sections or other societies.

Since virtually all AAAS sections and 35 organizations had programs, there were sessions of interest to specialists in nearly all the principal fields of science. There were some 126 sessions that were symposia, panels, or groups of invited papers centered about a particular subject—or about 2½ times as many as the 50 sessions devoted to contributed papers or to shorter accounts of current research.

There was balance between programs of concern to specialists, programs in interdisciplinary areas, and programs concerned with matters of import for all scientists. In addition, there were sessions for the science-minded public, and there was an afternoon event—the 15th Junior Scientists Assembly—especially for high school science students.

Within the limits of the available physical facilities, societies affiliated with the AAAS are welcome to meet with the Association on any scale they wish—in a full national meeting, in a special or regional meeting, or simply as cosponsors of a program arranged by a section or another society. There is a tendency for more societies to participate each year, but, typically, no one society's meeting requires an excessively large number of session rooms at one time, nor does any large bloc of societies within one discipline take up a disproportionate part of the entire program. Most of the societies find it possible to keep free, for the general events, the same portions of the meeting period that the sections do.

Table 1. Analysis of sessions at the third Denver meeting.

Sessions for symposia, invited papers, panels, etc.	126
Sessions for contributed papers	50
Sessions for addresses or lectures	43
Business sessions, committee meetings	50
Meals and social functions	45
Tours and field trips	5
Sessions for motion pictures	22
Junior scientists assembly	1
Total number of sessions	342

Arrangements for the Meeting

Numerous compliments on the arrangements for the 128th AAAS meeting have been received. Inevitably, some rooms were crowded beyond expectation; the two improvised rooms on level 1B in the Hilton would have been better as one; and some lantern slides were broken the first night. In general, however, all phases of the meeting went well.

Probably no meeting as large and uniquely complex as a AAAS meeting can ever be entirely free from a few problems and minor frustrations. That the meeting presented no serious difficulties and was as smooth-running and pleasant as it was is a tribute to many individuals—from program chairmen, research scientists, teachers, committee volunteers, and AAAS office personnel to skilled workmen, porters, and student projectionists. Literally hundreds of persons, in one way or another, contributed their thought and services.

In general, the hotels had enough session rooms of the right sizes, and these were adequately furnished and equipped. The hotel personnel, from managers to bellboys, not only were capable and cooperative but were uniformly courteous and friendly.

As headquarters hotel, the Denver Hilton was the site of the Annual Exposition of Science and Industry, the Science Theatre, the AAAS Office, and the AAAS Pressroom. The attractive south lobby lent itself to an efficient grouping of the desks for handling registration, requests for information about the AAAS and Denver, ladies' events, AAAS membership, and tickets for meal functions. The Visible Directory of Registrants and its special telephone were close by at one side.

The business sessions of the Association, the large evening events, and most of the general events were held in the Hilton. In general, this hotel housed the biological and medical groups, including the many sessions of the zoologists, the mathematicians, the chemists, and the geologists.

The Brown Palace and its new Tower accommodated the psychologists, the series of societies in the economic and social sciences, and Section L and its affiliates.

The Cosmopolitan was the headquarters for the sections on anthropology (H), dentistry (Nd) and pharmaceutical sciences (Np), as well as for the large attendance of the American Astronautical Society.

At the Shirley-Savoy were based the sections on physics (B), astronomy (D) and the American Astronomical

Table 2. Comparison of AAAS-sectional programs and society programs.

Session	AAAS, its sections, committees, and conferences	Participating societies	Total number of sessions with papers	Total number of speakers
Sessions for symposia, invited papers, panels	67 (433 speakers)	59 (362 speakers)	126	795
Sessions for contributed papers*	11 (80 speakers)	39 (284† speakers)	50	364
Sessions with addresses or lectures‡	20 (42 speakers)	23 (46 speakers)	43	88
Totals			219	1247

* Each paper is assumed to have been presented by a single speaker. † The figure does not include 54 papers read only by title. ‡ Addresses at meal functions are included.

Society, the section on education (Q), and the coordinated program of the four science teaching societies.

Most of the sessions were held in rooms of appropriate size, and almost every program had at least as large an audience as had been anticipated. Those instances where sessions over-flowed, even though rooms larger than called for by original estimates may have been requested and assigned—though they obviously attested to the attractiveness of these programs—none the less are regrettable. It is hoped that those who were inconvenienced in this way will understand.

The Book Lounge, operated jointly by the Society of Systematic Zoology and the American Society of Zoologists, the room of Sigma Delta Epsilon, and other society headquarters rooms, where business meetings, conferences, or spontaneous discussions could be held in comfort, were welcome features of the meeting.

The demand for projection facilities was heavy, but it was possible to meet last-minute requests because the Committee on Physical Arrangements wisely had provided extra equipment and not only had scheduled an operator for every session that had originally requested lanterns but had both projectionists and equipment in reserve.

The local Committee on Physical Arrangements always has one of the most taxing assignments. The Denver meeting had some 200 sessions that required one or more types of lanterns and an operator. Except for the Science Theatre, all equipment was borrowed from the academic institutions and city and suburban schools. To secure sufficient standard lanterns, still other sources were called upon.

In each hotel there were rooms (with keys and telephones) for the storage and distribution of lanterns and the assignment of operators. Projection operation was also the responsibility of the local committee under the direction of Shirley A. Johnson, Jr. (director, Denver Research Institute, University of Denver). Professional projectionists serviced the Science Theatre and the National Geographic Society session, but most of the rest of the operation was handled by volunteer science students who had received training in projection. These came from the University of Denver and the city and suburban schools. The Lowry Air Force Base and the Martin-Marietta Company also assisted the Committee on Physical Arrangements.

Projection requirement forms were issued in September and collated in October and November, so that the Committee could know how many lanterns and screens would be required, could plan for the collection, storage, and utilization of equipment as needed, and could recruit operators.

The magnitude of the debt of all the participants to all members of the Committee on Physical Arrangements and their projectionists is apparent. I herewith express the deep appreciation of the staff of the Association.

Housing and registration were ably handled by experienced staff members of the Denver Convention and Visitors Bureau. I am indebted to the head of these departments, Sue Ballard, and to Opal Johnson, who supervised the activities of the registration clerks. I am also greatly indebted to Clarence N. Hockom and Harry Litzenberger, manager and assistant manager, respectively, of the Denver Bureau, for their helpful advice and assistance before and during the meeting.

The professional guard service supplied men who did their jobs with understanding and courtesy. The AAAS office, the information center, and the AAAS booth were manned principally by AAAS staff members who had come from the Washington office. In addition, there were personnel engaged from the Convention and Visitors Bureau and from placement agencies.

Registration slips were collected from five registration points at intervals throughout each day. The slips were arranged in alphabetical order and carefully posted in the Visible Directory of Registrants. Paid workers handled the posting and answered the directory telephone. These workers and volunteers also assisted registrants in locating names or adding hotel-room data to their slips.

Highlights of the Meeting

As mentioned earlier, the Committee on Meetings has the primary responsibility for selecting the speakers for the four Moving Frontiers of Science lectures and the invited speaker for the second evening. The committee, meeting jointly with the section secretaries, also selects the interdisciplinary symposia and the program chairmen who will develop them. These events, the other special sessions, the vice-presidential addresses, and the invited addresses of the participating societies constitute the anticipated highlights of the meeting. Not infrequently there are additional programs, sometimes arranged at the last minute, that also attract considerable attention. Such a program was the symposium, "Problems of survival," arranged late in the year by the Association's Committee on Science in the Promotion of Human Welfare.

The committee's chairman, Barry Commoner, presided and contributed introductory remarks. There were four papers on different aspects of the consequences of a large-scale atomic attack on an American metropolis. The authors were Tom T. Stonier (Rockefeller Institute); Seymour Melman (Columbia University); Walter E. Strope (Office of Civilian Defense, U.S. Department of Defense); and Margaret Mead (American Museum of Natural History). Scheduled the afternoon of 26 December, this thought-provoking program got the meeting off to a fine start. The session was well-attended, and the press and radio coverage were outstanding.

The general program of the Association, "Moving Frontiers of Science," presented at each meeting, was held the evening of 26 December and the afternoon of 28 December in the grand ballroom of the Hilton Hotel. Part 1 consisted of two lectures, "Changing concepts of mineral raw materials in the national economy," by Howard A. Meyerhoff (executive director, Scientific Manpower Commission), and "The molecular designing of materials," by Arthur R. von Hippel (director, Laboratory for Insulation Research, Massachusetts Institute of Technology). William W. Rubey, member of the AAAS Board of Directors, presided. In the second session, Halton C. Arp (Mount Wilson and Palomar Observatories) spoke on the "Evolution of stars and galaxies," and E. W. Fager (Scripps Institution of Oceanography) spoke on "Energy flow in ecological systems." Harrison Brown, member of the AAAS Board of Directors, presided.

The second evening, 27 December, was devoted to the 29th John Wesley Powell lecture of the Southwestern and Rocky Mountain Division. Paul M. Gross, now president of the AAAS, presided. The address was given by Glenn T. Seaborg (chairman, U.S. Atomic Energy Commission). The title, a change from that given in the *General*

Program, was "A scientific society—the beginnings."

The second George Sarton memorial lecture, endowed by the George Sarton Memorial Foundation, was given by Joseph Kaplan (UCLA) before an appreciative audience in the ballroom of the Brown Palace Tower, the afternoon of 28 December.

On Honor Societies Night, 29 December, the annual joint address of the Society of the Sigma Xi and the United Chapters of Phi Beta Kappa was given by Harrison Brown (1947 winner of the Newcomb Cleveland prize and professor of geochemistry, Colorado Institute of Technology). He was introduced by William W. Rubey, and his address, "Scientists and government," was heard by an attentive audience that filled the combined ballrooms of the Denver Hilton. It was concerned with the part scientists can play in a democratic society. In part, the speaker discussed the current atomic weapons race and made the sobering prediction that catastrophic annihilation of human life on the planet would occur in 15 years —unless means were found to reduce tensions.

After a very brief interval, the annual address of the Tau Beta Pi Association, "The second engineering revolution," was given by John A. Logan (chairman, Department of Civil Engineering, Northwestern University). Paul A. Scherer, AAAS treasurer, presided. The speaker was introduced by George G. Lamb (member, Executive Council, Tau Beta Pi Association, and professor of chemical engineering, Northwestern Technological Institute).

The annual illustrated lecture and film of the National Geographic Society, "The sacred well of Chichén Itzá," presented on 30 December by Matthew W. Stirling (research associate, Smithsonian Institution, and member of the NGS committee for research and exploration) concluded the week's impressive list of special sessions. Margaret Mead (member, AAAS Board of Directors) presided. Local members of the society joined the AAAS attendance, with the result that only those who arrived early were able to find seats.

Twelve of the 18 AAAS sections sponsored vice-presidential addresses. Presidential and other important addresses, given under the auspices of the participating societies, are mentioned in the separate reports which appear elsewhere in this issue (page 547). Other highlights of this year's meeting were the AAAS general sessions and the AAAS Presidential Address and Reception.

AAAS Presidential Address

The address of the retiring (113th) president of the Association, Chauncey D. Leake, was given on the customary evening, 28 December, before a large and responsive audience in the grand ballroom of the Hilton Hotel. President Thomas Park presided and introduced Robert L. Stearns (president, Boettcher Foundation), general chairman of the third Denver meeting, who graciously welcomed all registrants to the scientific community of the city and the region. Also introduced was the guest of honor, Frank E. E. Germann, emeritus chairman, department of chemistry, University of Colorado, and past president and former secretary of the AAAS Southwestern and Rocky Mountain Division (1939–56); special guests Roland Harper, professor of psychology, the University of Leeds, representing the British Association; Jack L. Still, treasurer of the Australian-New Zealand Association for the Advancement of Science; P. S. Gill, secretary, Indian Science Congress Association; and Halton C. Arp, who was announced as the 1960 winner of the Newcomb Cleveland prize for his paper "The stellar content of galaxies."

Announcement was made, also, of the winners of the AAAS Socio-Pyschological Prize and the AAAS-Campbell Award for Vegetable Research. A brief mention of the winners has already appeared in *Science* [**135**, 91 (12 Jan. 1962)].

Chauncey D. Leake's address as retiring president, "The scientific status of pharmacology," held the attention of the large audience. It has already appeared in *Science* [**134**, 2069 (29 Dec. 1961)]. Following the address there was an informal reception in the adjacent foyer. Simple refreshments—coffee and crackers—were served; in addition, there was a "Dutch treat" bar nearby. The receiving line included the three presidents, the general chairman, and the two staff members of the platform party, together with their wives. For those in the receiving line it was, as always, a pleasure to be able to greet so many members and friends of the Association.

Other AAAS General Sessions

For the second time, as decided by the Committee on Meetings and the section secretaries, the morning of 28 December, "AAAS Day," was reserved primarily for interdisciplinary symposia, held concurrently. Details of these excellent, well-attended programs are given below.

The interdisciplinary symposium in the physical sciences, "Physics of the Upper Atmosphere," was a joint program of the AAAS sections on physics (B) and astronomy (D), cosponsored by the American Astronomical Society, the American Geophysical Union, the American Meteorological Society, and Sigma Pi Sigma. It was arranged by Stanley S. Ballard (University of Florida) and Alan H. Shapley (National Bureau of Standards, Boulder Laboratories), who presided. The speakers were William G. Stroud, Goddard Space Flight Center, Greenbelt, Md.; Edward Manring, Geophysics Corporation of America, Bedford, Mass.; Franklin E. Roach, National Bureau of Standards, Boulder, Colo.; and Von R. Eshleman, Stanford University.

A second interdisciplinary symposium, one in the earth sciences, "Geochemical Evolution—The First Five Billion Years," was especially arranged, in view of the many geologists in the area. It was a program of the AAAS section on chemistry (C), cosponsored by the AAAS sections on geology and geography (E), zoological sciences (F), and botanical sciences (G), the American Geophysical Union, and the Geological Society of America, with the assistance of the American Chemical Society, Colorado section, and the Colorado-Wyoming Academy of Science. It was arranged by T. S. Lovering (U.S. Geological Survey), who presided.

The speakers for "Part I: Cosmic and geological aspects" were G. R. Burbidge, Yerkes Observatory, University of Chicago; Harold C. Urey, University of California, La Jolla; Philip H. Abelson, Geophysical Laboratory, Carnegie Institution of Washington; and Albert E. J. Engel, University of California, La Jolla.

The speakers for "Part II: Minor elements in the biosphere and in surface waters," at which Essie White Cohn, University of Denver, presided, were Perry R. Stout, University of California, Davis; William H. Strain,

Strong Memorial Hospital, Rochester, N.Y.; Helen Cannon, U.S. Geological Survey, Denver; Walton Durum, U.S. Geological Survey, Washington, D.C.; Joseph Haffty, U.S. Geological Survey, Denver; and Charles Durfor, U.S. Geological Survey, Washington, D.C. A commentary on the whole symposium was given by T. S. Lovering and Essie White Cohn.

The interdisciplinary symposium in the biological-medical sciences was "Existing Levels of Radioactivity in Man and His Environment: Measurement and Significance." This was a joint program of the AAAS sections on pharmaceutical sciences (Np), zoological sciences (F), botanical sciences (G), medical sciences (N), dentistry (Nd), agriculture (O), and education (Q). It was arranged by John E. Christian, Purdue University, who presided. The speakers included Christian; Wright H. Langham, Los Alamos Scientific Laboratory; James R. Arnold, University of California at San Diego; Ernest C. Anderson, Los Alamos Scientific Laboratory; and P. R. J. Burch, University of Leeds, England. A question and discussion period ended the session.

The fourth interdisciplinary symposium was in the social sciences. "Water and Climate" was a joint program of the AAAS section on agriculture (O) and the Committee on Desert and Arid Zones Research of the AAAS Southwestern and Rocky Mountain Division, cosponsored by the AAAS sections on geology and geography (E), social and economic sciences (K), engineering (M), and industrial science (P), the American Geophysical Union, and the American Meteorological Society. It was arranged by Terah L. Smiley, University of Arizona, and D. Wynne Thorne, Utah State University, who had arranged four other sessions on land and water use. Terah L. Smiley presided. The speakers were Paul R. Julian, High Altitude Observatory, University of Colorado; John W. Harshbarger, University of Arizona; Earl G. Droessler, National Science Foundation; and Morris K. Udall, House of Representatives, U.S. Congress.

Another general session was a symposium on the morning of 29 December, "Teaching Machines and Mathematics Programs: The Interaction of Content and Programing Specialists in Developing Self-instructional Programs." This was the joint program of the AAAS Cooperative Committee on the Teaching of Science and Mathematics and the AAAS sections on mathematics (A) and psychology (I). It was arranged by Joseph Hammock, Bell Telephone Laboratories, Murray Hill, N.J., and John R. Mayor, AAAS, with the former presiding. The speakers were Lewis D. Eigen, Center for Programed Instruction, New York, N.Y.; John A. Barlow, Emory University; Norman A. Crowder, Educational Sciences Division, U.S. Industries, Inc., New York, N.Y.; Lloyd E. Homme, Teaching Machines, Inc., Albuquerque, N.M. and Jack E. Forbes, Britannica Center for Studies in Learning and Motivation, Palo Alto, Calif. Max Beberman (University of Illinois), R. Creighton Buck (University of Wisconsin), and Robert M. Gagné (Princeton University) served as discussants.

On 30 December there was a two-session symposium, "Water improvement," sponsored by the Committee on Desert and Arid Zones Research of the AAAS Southwestern and Rocky Mountain Division and cosponsored by the AAAS section on agriculture (O). It was arranged by Joseph A. Schufle, New Mexico Institute of Mining and Technology, and Terah L. Smiley, University of Arizona. The speakers, with Terah L. Smiley presiding, were William N. Gahr, Colorado State Department of Public Health, Denver; Gordon McCullum and Bernard B. Berger, U.S. Public Health Service, Washington, D.C.; David K. Todd, University of California, Berkeley; and H. H. Cooper, U.S. Geological Survey, Tallahassee, Fla. John W. Harshbarger (University of Arizona) served as chairman of the second session at which the speakers were George W. Murphy, University of Oklahoma, and Robert E. Glover and Morris M. Skinner, Colorado State University. A summary was given by Peter C. Duisberg (consultant, El Paso, Tex.) and John F. Lance (University of Arizona).

All of the foregoing general sessions had the excellent audiences they deserved.

Other Symposia

For the past 12 years at AAAS meetings there has been a continually increasing emphasis on symposia and a relative reduction in the number of sessions for contributed papers, on the part both of sections and of participating societies. At the third Denver meeting, six sections and nine societies had a total of only 50 sessions for submitted short reports of current research. (The American Society of Zoologists, with 14 such sessions and 107 papers, had the most.) In contrast, the AAAS, its sections and two committees, and the participating organizations, collectively, sponsored a grand total of 126 sessions of symposia (of one to six parts), panels, or groups of invited papers on chosen subjects. In planning these symposia, more and more care is given to choice of topic, selection of speakers, and provision for discussion.

As Table 1 shows, there were 2½ times as many sessions devoted to programs of the symposium type as to sessions for contributed papers, although some 20 organizations were holding national meetings with the Association. The total of 795 symposium participants markedly outnumbered the 452 other speakers.

Conferences

At each AAAS meeting three recurrent conferences have been regularly held for some years. The Academy Conference, composed of the official delegates of the 47 academies of science affiliated with the Association and of others interested in academy affairs, has met without interruption since its first program in 1928.

At Denver, on 27 December, after the business meeting in the morning, there was an interesting and important debate on collegiate academies and the academy conference dinner. Robert C. Miller (California Academy of Sciences) delivered the presidential address, on "Academies of science as catalytic agents." On 28 December there was a full afternoon session on junior academies, with three speakers; Gerald Acker was chairman.

The 15th annual Junior Scientists Assembly—a program especially for high school students, sponsored by the Association through the Academy Conference, was arranged by Sam S. Blanc, coordinator of instruction, Denver Public Schools. This was held on the afternoon of 28 December in the auditorium of the Baker Junior High School. There were two 45-minute papers, one on "Standards of measure-

ment," by Chauncey D. Leake, retiring president of the AAAS, and one on "The nature and causes of mutations," by AAAS Board member Bentley Glass, Johns Hopkins University.

The program of the Conference on Scientific Manpower, cosponsored by the Engineering Manpower Commission, the Scientific Manpower Commission, the National Science Foundation, and the AAAS sections on geology and geography (E) and on engineering (M), and arranged by a committee of which Thomas J. Mills (National Science Foundation) was chairman, was held the afternoon of 27 December. "Engineering and science—a struggle for survival?" was an invited address by Truman H. Kuhn, dean of faculty, Colorado School of Mines. Howard A. Meyerhoff (Scientific Manpower Commission) presided.

The 10-year-old Conference on Scientific Communication held its final session the afternoon of 30 December under happy circumstances: word had just come that the AAAS Council had unanimously approved the recommendation of the Association's Board of Directors that a new AAAS Section on Information and Communication (T) be established.

In anticipation, in the *General Program*, it had been stated that if approval came, this would also be considered the new section's inaugural session. The program, as arranged in October by Chauncey D. Leake, who presided throughout, consisted of papers by Phyllis Parkins *(Biological Abstracts)*, Ralph R. Shaw (Rutgers University), Isaac Welt (Institute for the Advancement of Medical Communication, Washington, D.C.), and Foster E. Mohrhardt (U.S. Department of Agriculture Library), and of two panels. One panel, on "Interdisciplinary science communication," had as members Dale Baker (*Chemical Abstracts*, Columbus, Ohio), Miles Conrad (*Biological Abstracts*, Philadelphia, Pa.), Graham DuShane (AAAS); Eugene Garfield (Institute for Scientific Information, Philadelphia, Pa.), Richard Orr (Institute for the Advancement of Medical Communication, New York, N.Y.), George L. Seielstad (Applied Physics Laboratory, Johns Hopkins University, Silver Spring, Md.), and Charles Shilling (AIBS Communication Project, Washington, D.C.). Members of the other panel, on "Communicating science to the people," were Victor Cohn (Minneapolis *Tribune*); Watson Davis (Science Service, Washington, D.C.), Hillier Krieghbaum (New York University), Edward G. Sherburne, Jr., (AAAS), and John Sherrod (Library of Congress).

AAAS Business Sessions

As required by the constitution, the Association's Board of Directors held its fourth regular meeting of the year at the annual meeting. Two of the sessions, as usual, preceded the two sessions of the Council (27 and 30 December), which are reported elsewhere in this issue. It is gratifying to note that the Council sessions were very well attended, especially in view of the distance to Denver from the nation's largest centers of population. The AAAS section officers' luncheon and business meeting, held on 29 December, was also well attended.

Table 3. Registrants by subject fields.

Mathematics and computers	112
Physical sciences	
Physics	190
Astronomy and astrophysics	141
Space sciences	116
Electronics	45
Meteorology	18
Chemistry (other than medical)	283
Geochemistry	26
Geophysics	19
Geology	270
Hydrology	27
Geography	46
Engineering and industrial science	125
Biological sciences	
Botanical sciences	142
Ecology	124
Genetics	86
Microbiology	41
Protozoology	46
Zoological sciences (all other)	355
Biology (in general, and other)	383
Medical sciences	
Biophysics	14
Biochemistry (including nutrition)	93
Physiology and endocrinology	104
Pharmacology	22
Pharmaceutical sciences	37
Dental research	37
Medicine (in general, and other)	225
Social and economic sciences	
Economics	48
Criminology	41
Sociology	31
Statistics	20
Agriculture (land-water use, conservation)	175
Anthropology and archeology	129
Psychology	129
History and philosophy of science	64
Science teaching	171
Education	130
Information and communication	66
Science in general and administrative	128
Students	85
Wives (fields unspecified)	132
No field indicated	233
Total	4709

The Attendance

As mentioned at the beginning of this report, in number of registrants (4709), the third Denver meeting was the sixth largest in the 114-year annals of the Association. The number of paid registrations exceeded those of the previous midwestern meeting, in Chicago in 1959. It was also pointed out that, in general, AAAS meetings are getting larger. To date, though, only 16 of the 128 AAAS meetings have had more than 3000 registrants; ten of these 16 have been meetings held in the past 13 years. With its present pattern of strong sectional symposia and other AAAS features and the varied and attractive programs arranged by the many participating societies, the Association, from now on, should be able to count on its meetings being well attended wherever they are held. It is always true, moreover, that the total attendance at any national meeting of the Association is much greater than the number of registrants, since all programs and most events are open to everyone. As usual, nearly 100 percent of the professional scientists and teachers registered. Incidentally, members of the American Astronomical Society paid a "double registration"—the regular AAAS registration of $3 plus a second fee of like amount for the society. The American Astronautical Society had its own registration, but some of its members also registered with the AAAS. Only these latter are included in the total AAAS registration.

In addition, however, there are always several thousands of science-minded members of the general public who attend the evening lectures or some other event who do not register at all. Even a technical program for specialists may be attended by several times the number of individuals registered for that discipline (see Table 3). It is probable that at the Denver meeting at least an additional 4000 individuals attended one or more of the 342 sessions. Finally, the registration total of 4709 does not include 88 guests, 299 individuals connected with the exhibits, and 123 press representatives.

Table 3 is an analysis of the 4709 registrants by subject fields, except for 365 instances where the "field of interest" line on the registration slip was left blank and no other clues were available. Undoubtedly some of those who gave no field of interest were individuals who had registered hastily on their

way to programs for which they were late. Of the remainder, 132 were wives of registrants. Between 250 and 400 wives attended the meeting; many of them listed scientific interests. The "sciences in general" category includes a substantial number of research and other administrators.

In this analysis of subject fields, every effort was made to record each individual's primary interest. For example, high school science teachers who indicated their *major* interest as teaching or science education were not classified as biologists or chemists, and conversely, science teachers who stressed disciplines were tallied accordingly. If the data on disciplines are grouped under still broader headings than those of Table 3, the composition of the registered attendance is as follows: Physical sciences and applications, 1418 (30 percent); biological sciences, 1177 (25 percent); medical sciences, 532 (11.3 percent); psychology and social and economic sciences, 637 (13.5 percent); science teaching and education, 367 (8 percent); general interest and other, 578 (11.4 percent).

The percentages for these groups have remained much the same in recent years except for instances when the physical sciences would take first place by a slight margin—as in 1952 in St. Louis and in 1957 in Indianapolis. Again at Denver, however, the physical sciences took first place over the biological sciences. The programs in astronomy, physics, space sciences, chemistry, and geochemistry obviously appealed to the many local scientists and engineers working in these fields, as well as to others from outside the area. Perhaps the most significant drop was in the medical sciences—down to 11.3 percent from its usual 21 percent. Part of this may be attributable to the specialized nature of the program of the section on medical science, and partly to the relatively smaller population in the area engaged in medical research.

The strong emphasis on land and water use in various programs and a gratifying series of programs in the social and economic fields, including criminology, brought the percentage for social science registrants up to 13.5 percent of the total registration.

As Table 4 shows, 2345 registrants, or almost exactly 50 percent, came from Colorado; conversely, 50 percent of the registrants came from outside this large state. The figure for the registrants from the Denver area—the city and its suburbs within 18 miles of the Civic Center—is 1596, two-thirds of the state's attendance but only 33 percent of the total attendance. This figure is the same as that estimated for those from the metropolitan area who attended the New York meeting of the previous year. Again, two-thirds came from areas beyond convenient commuting distance.

Table 4. Distribution of registrants by states and countries.

Alabama	10	Ohio	61
Alaska	9	Oklahoma	21
Arizona	62	Oregon	34
Arkansas	5	Pennsylvania	62
California	288	Puerto Rico	2
Colorado	2345	Rhode Island	4
Connecticut	16	South Carolina	2
Delaware	1	South Dakota	24
District of Columbia	105	Tennessee	20
Florida	19	Texas	70
Georgia	8	Utah	68
Hawaii	3	Virginia	24
Idaho	22	Washington	36
Illinois	190	West Virginia	1
Indiana	56	Wisconsin	57
Iowa	58	Wyoming	95
Kansas	90		
Kentucky	11	Total U.S.	4659
Louisiana	16		
Maine	3	Australia	1
Maryland	78	Canada	34
Massachusetts	69	Canal Zone	1
Michigan	92	England	2
Minnesota	47	Germany	1
Mississippi	11	Nepal	1
Missouri	61	Pakistan	1
Montana	24	Peru	2
Nebraska	54	Philippines	4
Nevada	7	Salvador	1
New Hampshire	6	Southern Rhodesia	1
New Jersey	49	Venezuela	1
New Mexico	59		
New York	183	Total foreign	50
North Carolina	12		
North Dakota	9	Total paid registration	4709

It was particularly gratifying that no portions of the less populous parts of Colorado were unrepresented at the Denver meeting. Registration data for other communities of the state are as follows: Boulder, 267; Fort Collins, 166; Colorado Springs, 86; Greeley, 39; Grand Junction, 15; Alamosa, 13; Pueblo, 11. There were 11 communities with four to ten registrants; seven with three each; 12 with two each; and 37 with one each—a grand total of 84 locales.

Except for Vermont, each of the 50 states in the nation was represented. There were 34 registrants from Canada, and there were 16 scientists who represented 11 other countries. Many, but not all, of these were visiting scholars at American institutions.

The large attendance from so many geographical areas and the excellent representation at programs of each of the sections again demonstrated that when programs of the symposium type are well chosen with respect to subject and are of high quality, a gratifying number of scientists and members of societies not meeting with the Association will travel long distances to attend them.

Annual Exposition of Science and Industry

The Annual Exposition of Science and Industry for 1961 was one of the most varied and attractive ever held. In addition to a splendid series of exhibits of publishers, supply houses, instrument companies, and laboratory-equipment firms, there was a most gratifying series of special and large-scale industrial exhibits—some especially built for this AAAS meeting—which were of decided interest to the many registrants who saw them.

Although level 2B of the Convention Center of the Denver Hilton was far from ideal as a site for the Annual Exposition of Science and Industry, everything else about the exhibits turned out well. The hotel was able to permit the Paradice Decorating Company to erect their booths on 23 December, and the Weicker Transfer & Storage Company delivered exhibit crates that same day.

Thus, exhibitors had all of 26 December to unpack and set up exhibits at their leisure. There were few if any exhibitor shipments that were not on hand that morning.

Originally only 93 booths could be laid out; then number 94 was squeezed between two pillars. The large exhibit of Bell Telephone System, which featured the first large-scale demonstration of their new Electronic Central Office, was assigned five booths and aisle space equivalent to four more booths. Finally, the AAAS membership booth was moved out of the exhibit area. With all space gone several months before the meeting, again it was necessary to turn away late applications.

Signs were placed at the entrance to every session room in the four hotels, to remind participants to see the exhibits during the 4 days they were open. The four hotels, the Petroleum Club, and the auditorium of the University of Denver Law School that housed the many daytime sessions were all so near to one another that probably every registrant saw the exhibits at least once.

In summary, those who attended were very pleased with the variety and attractiveness of the exhibits; and, subsequently, the exhibitors have gone out of their way to compliment the AAAS on both the arrangements and the satisfactory "booth traffic."

The local Committee on Exhibits, headed by Walter K. Koch (president, Mountain States Telephone and Telegraph Company), enlisted the interest and support of large firms in the Denver area. The exhibits of the Bell System, already mentioned, Climax Molybdenum, The Martin Company, Sunstrand Aviation, and others were striking. Grateful acknowledgment of the work of the Exhibits Committee is made on behalf of the Association and of all those who enjoyed the Exposition.

We are grateful to Earl Scherago and Herbert Burklund from the advertising office of *Science* for their devoted and most helpful services in the exhibit area.

The names of all but one of the 80 exhibitors and descriptions of their exhibits appeared both in the *General Program* and in the preconvention issue of *Science* [**134**, 1859 (8 Dec. 1961)]. The additional exhibitor, accommodated after the preconvention issue had gone to press, was Thorne Films, Inc. This was table space, since all regular booths had been assigned months before.

AAAS Science Theatre

At each meeting since the Chicago meeting of 1947, the AAAS Science Theatre has shown a selection of the latest foreign and domestic scientific films. It is now an established feature of the annual meeting of the Association. At the third Denver meeting, 16-millimeter films were shown in seven 4-hour programs and in an abbreviated eighth session. The film titles and producers appeared in the preconvention issue of *Science* [**134**, 1854 (8 Dec. 1961)]. Most films were shown twice, and some a third time. The cooperation of the lending agencies is appreciated. Inevitably, there were a few changes from the scheduled program. Two films did not arrive, and a third arrived late, but in time for two showings. For such emergencies we had on hand, and used the following: "Eaton Agent Pneumonia" and "Fractionation of Hydatid Fluid," both produced by the Audiovisual Section, Communicable Disease Center, U.S. Public Health Service. All the films have now been returned to their sources; inquiries about them should be directed to the producers.

Work of the Local Committees

Each year there are new registrants, new AAAS members and friends, and even new staff members who come to realize that a scientific meeting as large and as complex as the annual meeting of the AAAS does not just happen. It cannot take place, nor can it succeed, without the cooperation and assistance of a great many agencies and persons. Of critical importance among these are the local committees and the general chairmen and other chairmen who appoint them.

The Association and all who attended the third Denver meeting are deeply indebted to Robert L. Stearns (recent past president, Boettcher Foundation) who, as general chairman, made distinguished appointments of chairmen of the local committees, kept in close touch with all phases of the meeting, and graciously welcomed members and friends of the Association on the evening of 28 December. On behalf of the Association, grateful acknowledgment of the indebtedness of all of us to Robert Stearns is made here.

The strenuous work of the Committee on Physical Arrangements and the contribution of the Committee on Exhibits are acknowledged above. The other committees, in their respective fields, also contributed greatly to the meeting.

The Committee on Public Information headed by Arthur G. Rippey (Rippey, Henderson, Bucknum, & Co.) and Gerould A. Sabin (director of public relations, Colorado Fuel and Iron Corporation) provided expert advice and assistance in securing publicity and in providing excellent local coverage. Alberta Pike, of Alberta Pike & Associates, was immensely helpful. The Association expresses its grateful appreciation to every member of this committee for his or her contributions. Additional details on this, and on the splendid national coverage during the meeting, both in the press and on radio and television, will be found in the report, "Public information service," by Sidney S. Negus on page 545 of this issue.

The Association is greatly indebted to the local Committee on Women's Events, sponsored by the Denver branch of the American Association of University Women and headed by Ann Byrd Kennon, for its devoted and able services over the entire week in welcoming wives and other visitors and in arranging a special trip to the U.S. Mint. Grateful appreciation for the help of each member of this committee is herewith expressed.

The Association acknowledges with deep appreciation the work of the Finance Committee, which, headed by its chairman, C. A. Norgren, most effectively raised funds to eliminate the deficit. Robert L. Stearns, the general chairman, assisted the committee and had a major role in receiving gifts from foundations. The firms and individuals who have made contributions, and to whom the Association expresses its grateful thanks, include the following:

American Crystal Sugar Company
Argo Oil Foundation
Attractive Homes Company
AVC, Inc.
Beech Aircraft Corporation
Boettcher and Company
Boettcher Foundation
Frederick G. Bonfils Foundation
Bosworth, Sullivan and Company
Bowman Biscuit Company
Butler Publications
Cambridge Center
Clifton Precision Products Co., Inc.
Colorado and Southern Railway Co.
Colorado Oil and Gas Corporation
Columbia Savings and Loan Association
Continental Air Lines, Inc.

Continental Oil Company
Ben Cook Foundation
Adolph Coors Company
Clyde C. Dawson
The Denver Brick & Pipe Co.
Denver Chicago Trucking Co. Inc.
Denver Clearing House Association
Denver *Post*
Denver Union Stockyards Company
Denver United States National Bank Foundation
Dependable Plumbing and Heating Co.
Martin K. Eby Construction Co. Inc.
Empire Savings Building and Loan Association
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Fab-Tool, Inc.
First National Bank of Englewood
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Goorman's Inc.
Great Western Sugar Company
Gump Glass Company
Haskins and Sells
Clint J. Helton Co.
Holan Corporation, Timpte Division
Humphreys Engineering Company
Ideal Cement Company
Intermountain Elevator Company
Joy and Cox, Inc. Sales Engineers
KBTV-Channel 9
King Soopers
F. J. Kirchhof Construction Co.
Kistler Stationery Company
Loiseau-Neiswanger and Company
R. L. Manning Co.
Martin Shippers Supply, Inc.
Metal Goods Corporation
Midwest Oil Foundation
Midwest Steel & Iron Works Co.
Gilbert J. Mueller
Minneapolis-Honeywell Regulator Co., Heiland Division
C. A. Norgren Co.
Overgard Machine Tool Co.
Parish Electronics
Peat, Marwick and Mitchell and Co.
Pearl-Friedland Company, Inc.
Petroleum Club
Petry Construction Company
Phillips-Carter-Osborn, Inc.
A. J. Philpott Company
The Lawrence Phipps Foundation
Pittsburgh Plate Glass Foundation
Pool Investment Co.
Potash Company of America
Reproductions, Inc.
L. L. Ridgeway Co., Inc.
Rio Grande Company
Seal Office Supply, Inc.
Shell Oil Company
Samuel E. Sherman, Jr.
Shwayder Brothers
The Silver Corporation
Stanley Aviation Corporation
Robert L. Stearns
Charles S. Sterne
Sturgeon Electric Co.
Sundstrand Corporation
Tipton and Kalmback, Inc.
Title Guaranty Company
The Van Gilder Agency Co.
Van Schaack and Company
Weicker Transfer & Storage Company
Woodward Governor

The Honorary Reception Committee included heads of public and private agencies concerned with science and education. Many were able to be present during the meeting or made a point of attending the AAAS Presidential Address and Reception.

Not only was the work of the Denver Committees highly effective in all respects but there was a warm, friendly interest throughout.

Other Acknowledgments

Besides thanking all members of the local committees, this report of the 128th meeting would not be complete without an expression of appreciation to the key executives of the four hotels which provided assistance and friendly help throughout—especially Richard M. Noble and William Elges of the Hilton and their counterparts at the Brown Palace, Cosmopolitan, and Shirley-Savoy. Their cooperation and courtesy were essential for the success of the meeting.

The secretaries and program chairmen of the sections and participating organizations cooperated ably, especially in providing copy and galley proof for the 280-page *General Program*, published by the Horn-Shafer Company of Baltimore. The debt to W. Gilbert Horn, Jr., of that firm for his able and sympathetic cooperation in seeing the program through the press is more than nominal. Finally, we are grateful to the AAAS staff members from Washington, all of whom worked long, hard, and cheerfully. Their efforts, especially those of Johnette Clark and Jane Mahon from our office, are gratefully acknowledged.

Public Information Service

Sidney S. Negus

The 128th meeting of the AAAS in Denver afforded the Association, as usual, one of its means for trying to better public understanding and appreciation of the importance and promise of the methods of science in human progress. The initial step in this effort was taken in May by Robert L. Stearns, president of the Boettcher Foundation and general chairman of the Denver meeting, when he invited Arthur G. Rippey, of Rippey, Henderson, Bucknum and Company, to be chairman of the committee on public information on a volunteer basis. Most fortunately for the Association, Rippey accepted this invitation. Later, Gerould A. Sabin, director of public relations for the Colorado Fuel and Iron Corporation, was appointed cochairman. These communication leaders in the West then invited the following to work with them: Gene Amole, co-owner of radio station KDEN; Len Berman, publicity director, station KTVR; Chris Burns, head of the department of journalism at the University of Colorado; James Case, executive director, station KRMA-ETV; Colbert E. Cushing, director of public information, Colorado Education Association; Robert de Kieffer, director of the bureau of audio-visual instruction, University of Colorado; Jack Foster, editor, *Rocky Mountain News*; William Grant, president, radio and TV station

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