

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
 John Evans Family
 Fab-Tool, Inc.
 First National Bank of Englewood
 General Electric Company
 Goorman's Inc.
 Great Western Sugar Company
 Gump Glass Company
 Haskins and Sells
 Clint J. Helton Co.
 Holan Corporation, Timppe 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 Kalmbach, 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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KOA(NBC); E. Palmer Hoyt, editor and publisher, *Denver Post*; John B. Mullins, president, station KBTB(ABC); Alberta Pike, public relations consultant; Hugh B. Terry, president and general manager, radio and TV station KLZ(CBS); and Richard B. Wheeler, president, radio station KTLN. It was the responsibility of this committee to help set the pre-meeting stage for the formidable task of informing the public throughout the world of the newsworthy reports to be made concerning the progress of science in all its branches at this great gathering of scientists from some 300 colleges, universities, industrial organizations, and government agencies in this country and abroad. The local committee worked toward this end during the fall most effectively.

The next step was taken at the Medical College of Virginia, Richmond, in late July when active preparations were begun for this Denver meeting, in which the 18 AAAS sections and 86 affiliated scientific organizations participated. The usual pre-meeting procedures, which have been found more or less successful in the past, were followed [*Science* **127**, 409 (1958)].

One hundred and twenty-five accredited representatives of press, radio, and television registered in the press room at Denver. There may have been others who covered the meeting who did not register. Sixty-six other reporters in the United States and Canada and ten abroad reported the meeting, presumably from nontechnical abstracts and complete papers mailed to them upon request before and during the convention. Thus, the total number of reporters covering this huge gathering of scientists was 201. The meeting was brought to the attention of millions of people in this country and abroad.

First of all, the *Denver Post*, the *Rocky Mountain News*, and Cervi's *Rocky Mountain Journal* must be highly commended by this department of the Association for their extensive and accurate reporting of the newsworthy papers on the program. For the many examples of excellent science writing in these newspapers during the week, our thanks go especially to experts like Gene Lindberg, Gregory Pearson, Robert L. Perkin, Allen Young, and others on the staffs of these three top publications of the Rocky Mountain area.

Coverage by science writers for the wire services and by reporters for newspapers outside of Denver, including those abroad, was unusually good, as

far as can be determined from clippings and letters sent to this department by friends since the close of the meeting. We were informed by Denver Western Union that the total number of words telegraphed by reporters other than those representing the wire services and other organizations with local bureaus was approximately 102,000. Besides, since returning to Richmond, we have received requests from individuals and organizations in 36 foreign countries for more information about specific papers on the program. These facts lead us to believe that reports about the conclave must have been published widely.

Weekly magazines which devote some or most of their nonadvertising space to science reporting covered the meeting well in most cases. Registered in the press room were representatives of such leading magazines as *Newsweek*, *Chemical and Engineering News*, *Business Week*, *Modern Medicine*, *Reader's Digest*, *National Geographic Magazine*, *Medical World News*, and others. Besides these correspondents actively on the scene, other reporters for leading news weeklies, including several abroad, must have reported the meeting from advance copies of abstracts and papers sent to them. Feature stories in monthly magazines having to do with symposia or with papers are now beginning to appear. There were many representatives of magazines registered in the press room, principally to pick up ideas for future articles. It is hoped, if and when these are published in the weeks and months to come, that a credit reference will be given to the Association's program in Denver.

Local and national radio and television coverage was especially good. Credit for this goes to our expert associate in these fields, Alberta Pike, who was in charge of radio and television programs for the meeting; to Edward G. Sherburne, Jr., AAAS headquarters in Washington; and to the members representing the nonprint media on the Association's public information committee. Working in close cooperation with the press room, these communication specialists set up several coast-to-coast network programs on television, including spots on two of the "Today" shows; local showing of three of the major symposia; four general television news broadcasts; and 13 live or filmed interview programs. Twenty-eight interviews were carried on local radio stations. Several TV programs

will be reappearing in the weeks to come as delayed showings. Two programs were recorded and supplied to the Voice of America for beaming abroad. Extensive taping was done for future use by Radio Luxembourg and Radio France. Eleven sessions of the meetings were recorded by the University of Colorado's TV and Radio Bureau for the National Association of Educational Broadcasters, and these recordings will be widely disseminated by that organization.

Twenty-one formal press conferences and many informal individual interviews were held during the meeting. The conference having to do with papers on one of the general session programs, "Problems of survival," was exceptionally successful and resulted in extensive reporting of this particular symposium. Other conferences which attracted a great deal of attention on the part of science writers were those on "Extraterrestrial biochemistry and biology," "Physiological and biochemical aspects of human genetics," "Geochemical evolution," "Existing levels of radioactivity in man and his environment," "Metal fatigue," "Magnetic fields in the solar system," "Criminology problems," "Manned lunar flight," and "Evolution of stars and galaxies."

To Thomas Park, AAAS president at the time of the meeting, Chauncey D. Leake, immediate past president, Paul M. Gross, AAAS president as of 15 January 1962, Dael Wolfe, AAAS executive officer, Raymond L. Taylor, AAAS associate administrative secretary (who was in charge of arrangements for the Denver meeting), Hans Nussbaum, business manager, Graham DuShane, editor and chairman of the editorial board, Edward G. Sherburne, Jr., director of studies on the public understanding of science, and members of the AAAS Board of Directors go the thanks of this department for their helpfulness on many occasions and for giving it a free hand to function as it deems best for the Association.

The AAAS is grateful to the friends of its public information service for helping to make enjoyable the intensive task of reporting a meeting of this magnitude to the general public. Among these friends are the American Tobacco Company Research Laboratory, which contributed daily coffee breaks for reporters working in the press room; the Florida Citrus Commission, which supplied fresh orange juice each day for the hardworking press; the General Electric

Company Research Laboratory, which made available its suite, long a rendezvous for science writers at AAAS gatherings after each day's work; and the Westinghouse Electric Corporation, which sponsored the Science Writing Awards reception and dinner.

For the tenth successive year, Thelma C. Heatwole, patent liaison officer for the Philip Morris Research Center, was associate director of the press room at the AAAS annual meeting. Her long experience as an intermediary between scientists and the press helped us greatly to supply source material quickly for the reporters covering the meeting. In addition, besides Alberta Pike, the following individuals carried out press room assignments efficiently and effectively: Foley F. Smith, of Richmond, Virginia; Mary G. Bayes, of Alberta Pike and Associates, Denver; Charlotte Trego, of Colorado Women's

College; William E. Trout, III, of Indiana University; and Margaret Staley, Carol McClure, and Donna Wallace, of the Denver area. We also appreciate the cooperation of Robert M. Mellen, resident manager of the Denver Hilton, and his associates, William Elges, Janice Scogins, and others, for taking care of our innumerable requests so promptly and courteously.

The press room prize for asking the least number of questions was awarded to Walter Sullivan. His reporting of the meeting for the *New York Times* was masterful. Previous winners have been Victor Cohn of the *Minneapolis Tribune*, the late Robert Dwyer of the *New York Daily News*, and Harry A. Nelson of the *Los Angeles Times*. The science writer who traveled the farthest to cover the meeting was Lucien Barnier of Paris. He taped many addresses and news conferences for future

airing in Europe. David Walker of the Canadian Broadcasting Corporation taped programs for future broadcasting in Canada.

Awareness on the part of science writers and reporters in general that news in all branches of science is available at a AAAS annual meeting was certainly evident in Denver. The Association compliments representatives of the press, radio, and television on this alertness and is extremely grateful that they assumed responsibility for accurately reporting this news throughout the world. We suspect that much of this increased cooperation on the part of the press stems from the fact that scientists appear to be more willing in these times to relate themselves and their work to the larger social environment, a trend referred to by Glenn T. Seaborg in his John Wesley Powell lecture in Denver.

Reports of Sections and Societies

Mathematics (Section A)

"Man and the computer" was the topic of a program of three papers arranged by W. F. Cahill (Goddard Space Flight Center) and sponsored by the Association for Computing Machinery. An overflow audience of nearly 100 attended this first program of Section A, on 28 December. Speaking on the intellectual implications of the computer revolution, Richard W. Hamming (Bell Telephone Laboratories) observed that the way man looks at himself and at his world is undergoing a change comparable to that of the Copernican and Darwinian revolutions. Quantitatively, computation has been increased in speed by a factor of 1 million and has been decreased in cost by a factor of 1000. Comparing this with the tenfold increase in speed that resulted from introduction of the motor car and with

the social revolution it caused, Hamming warned that a philosophy for the future man-machine combination is yet to be created but that "it is time to start searching for one." Numerous examples of present uses of computers were given. These ranged from the simulation of musical instruments, the composition of music, the translation of languages, and the design of new languages to the carrying out of engineering calculations. On the latter subject Hamming remarked that in the future the 10 percent of the work of an industrial laboratory now done on a computer will become 90 percent.

The second paper was a coordinated presentation by D. Bitcer and P. Braunfeld (both of the University of Illinois) of their work on the use of a high-speed digital computer for automatic teaching. In their study the full logical power and speed of a digital computer

(the Illiac) is combined with the capabilities of a slide selector to produce an electronic blackboard on the television screen provided each student. With an individual key-set for use in responding to the material presented, each student proceeds at his own speed, asking for help (by means of a "Help" button) when necessary, yet able to cut short the additional explanation at will (by pushing the "Aha" button). The questions and comments of the audience demonstrated great interest in this flexible and logically powerful approach to the concepts of programmed learning. One of the speakers estimated that a modern computer in the million-dollar class might be able to "instruct" from 5000 to 10,000 students simultaneously and stated that it was especially exciting to have the computer itself help students learn to program a computer. The possibility of having key-sets for communication with a computer over a telephone line was discussed (a comment overheard at the conclusion of this paper was: "This may be 1984 but it looks like progress").

J. H. Wegstein (National Bureau of Standards) concluded this session with a paper on the use and translation of artificial languages. He mentioned 12 languages (either obsolescent, little used, or intended for research on structure) that have been adapted or invented to provide easier yet unambiguous communication between man and machine.