Meetings and Societies

Recent Close Approach of Mars

On 7 Sept. 1956, the planet Mars was 35,131,000 miles from the earth, its closest passage since 1924. An equally near approach will not occur again until 1971.

When the American Astronomical Society met jointly with Section *D* of the American Association for the Advancement of Science in New York, 26–29 Dec. 1956, an afternoon session (28 Dec.) at the American Museum of Natural History was devoted to a symposium on "The recent close approach of Mars." The session was presided over by Fred L. Whipple, director of the Smithsonian Astrophysical Observatory. Those who presented communications were R. S. Richardson (Mount Wilson and Palomar Observatories), Seymour Hess (Florida State University and Lowell Observatory), G. P. Kuiper (Yerkes and McDonald Observatories), C. C. Kiess (National Bureau of Standards), C. H. Mayer (Naval Research Laboratory), and William Sinton (Smithsonian Astrophysical Observatory). No complete or final reports could be expected so soon after the event; full analyses of the data obtained during several weeks' observing will take many months. Discussions, necessarily, were progress reports and concerned the general nature of the observing programs. There were some preliminary results of special interest.

Since the rotation period of Mars differs from the earth's day by only 37 minutes, an individual observatory can obtain only a partial record of any given area of the planet. The sides visible from North America and Asia during a single week are almost mutually exclusive. In order to have more nearly continuous coverage, an international photographic patrol by ten observatories was set up under the International Mars Committee, with headquarters at Lowell Observatory, Flagstaff, Ariz. E. C. Slipher and A. G. Wilson, jointly, are secretaries of the committee. A patrol by visual observers was also organized to note the presence and movement of Martian clouds.

The program of Lowell Observatory was reported by Seymour Hess. Under the sponsorship of the National Geographic Society, Slipher worked at the Lamont-Hussey Observatory (University of Michigan) at Bloemfontein, South Africa, and obtained about 38,000 photographs of Mars. The peculiar W-shaped cloud that appeared in 1954 was again shown by blue photographs, during a short interval. Visibility of surface features at this opposition was relatively poor, owing to very dusty conditions in Mars' atmosphere. However, the new dark area east of Syrtis Major, first seen in 1954, was recorded, despite the unfavorable conditions.

The color of the dark areas, the so-called "seas," has often been described as distinctly green or greenish-gray. Richardson, with the 60-inch and 100-inch reflectors at Mount Wilson, found that the seas appeared slate-blue most of the time, though at the end of the observing period, in October, the blue color was definitely gone and they appeared gray-green. The change may have been a seasonal effect. Kuiper, using the 82-inch reflector at McDonald Observatory, compared the surface features with a color chart illuminated to simulate sunlight. Under the best seeing conditions the seas appeared, to him, neutral gray, but those near the polar cap had a brownish tinge. In the equatorial region there was no brown, but some areas had a slight moss-green tone. With poorer seeing, a greenish shade was more apparent. He suggested a psychological explanation. When seeing is poor, the eye tends to wander about, so that the green after-image affects the observer's impression of the color of the dark areas. The red deserts are not of a uniform color but show different yellowish and reddish tones.

Kuiper made an interesting suggestion concerning the permanence of the dark areas. It might be expected that yellow wind-borne dust from the deserts would eventually obliterate the seas unless they are renewed by growth of vegetation (Opik) or by deposition of new volcanic ash (McLaughlin). However, Kuiper points out that if they are lava, with a smooth, glassy surface, the winds would keep them swept clear. (I have grave doubts that the smoothness could persist for many millenia, in the face of weathering agents that must exist on Mars.)

The most spectacular feature of the observations was the vast dust cloud that hid Mare Sirenum and adjacent regions for several days, beginning 30 Aug. This appeared as a great, irregular, yellow ribbon, 3000 miles long. It may have caused obscuration even of the polar cap, which was invisible for several days and then reappeared.

The polar cap appeared to Kuiper to be either pure white or to have a slight tinge of ivory. The Lowell observations indicated that the cap shrank more rapidly than usual.

The famous "canals" seemed to be considered a minor problem and received only casual attention. Richardson, on one occasion, saw many canals with the 60-inch reflector, when Mars was about 74 million miles distant. To him they appeared blue, like the "seas," definitely not straight and fine but decidedly irregular, "like veins in some mineral." Kuiper stated that some canals, apparently, are not actual markings but are caused by the contrast at boundaries between areas of different tone in the reddish regions. These results are at least partly favorable to the conclusion, drawn by Antoniadi of Paris many years ago and later supported by Dollfus at Pic du Midi, that canals represent a merging of fine detail when they are viewed with inadequate resolving power. But the myth of possibly artificial canals will probably persist in the public mind for years to come.

Microwave emission from Mars was detected with the 50-foot paraboloid of the Naval Research Laboratory by C. H. Mayer, T. P. McCullough, and R. M. Slonaker. The radiation (wavelength 3.15 centimeters) was near the limit of measurement but definite. Evidently it is of purely thermal origin. Its strength is that of the emission from a black body of the dimensions of Mars and at a temperature of 230°K. No "thunderstorm static" like that of Jupiter or Venus has yet been received from Mars.

Sinton recorded the infrared spectrum of Mars with a lead sulfide cell. A minimum of radiation near 3.4 microns is tentatively attributed to the carbon-hydrogen bond resonance. If confirmed, this is favorable to the presence of some form of vegetation.

Hess discussed the cause of the "blue haze" in the Martian atmosphere. Both carbon dioxide and water vapor must be present. Condensation of each into snow has been suggested as the cause of the blue haze. Hess' calculations show definitely that carbon dioxide clouds would be too opaque. Water ice could produce the haze only if the frost point is near −90°C. This is consistent with the scarcity of water as shown by spectroscopic tests. It is therefore possible that water crystals cause the haze.

High dispersion spectra of Mars were

photographed by Kiess and C. H. Corliss (National Bureau of Standards) at the Slope Observatory of the U.S. Weather Bureau, Mauna Loa, Hawaii, and later at Georgetown University Observatory. Comparison with the spectrum of the moon showed no detectable lines of oxygen or water or the carbon dioxide bands at 7820 and 7882 A that appear in the spectrum of Venus. The Doppler shift of Mars' spectrum was enough to separate any such lines from those formed in our own atmosphere. This program was sponsored by the National Geographic Society. Richardson, with the 100-inch reflector at Mount Wilson, attempted to test the suggestion that water vapor might be more abundant near inferred sites of (hypothetical) Martian volcanoes. The result was negative.

Very little evidence was obtained that had a direct bearing on the hypothesis that the dark areas are wind-deposited volcanic ash. The recurrence of the W-shaped cloud of 1954 can be construed as somewhat favorable, but other mechanisms are possible.

Although the closest approach is past, 1956 was not the very last chance before 1971 to learn more about Mars. On 8 Nov. 1958, the planet will be about 45 million miles distant. The less favorable distance will be partly offset by a higher altitude above the horizon for northern observatories, so that effects of our atmosphere may be less serious, although generally poorer weather conditions can be expected at that time of year.

DEAN B. MCLAUGHLIN
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Society Elections

■ National Wildlife Federation: pres., Claude D. Kelley; sec., Charles H. Callison, 232 Carrol St., NW, Washington, D.C.; treas., Louis W. Wendt. The vice presidents are Roland McClamroch, Paul A. Herbert, and F. Ross Brown.

■ American Economic Association: pres., Morris A. Copeland, Cornell University; sec.-treas., James W. Bell, Northwestern University. The vice presidents are Ben W. Lewis and Joseph J. Spengler.

■ Association for Symbolic Logic: pres., Stephen C. Kleene, University of Wisconsin; sec., Joshua Barlaz, Rutgers University. Representative to the AAAS Council is Ernest Nagel, Columbia University.

■ Board of Regents, National Library of Medicine: 1st chairman, Worth B. Daniels, Georgetown University; v. chairman, Champ Lyons, University of Alabama Medical College; sec., Frank B. Rogers, National Library of Medicine.

■ American Folklore Society: pres., Wayland D. Hand, University of California, Los Angeles; 1st v. pres., Sol Tax, University of Chicago; 2nd v. pres., Richard M. Dorson, Michigan State University; sec.-treas., MacEdward Leach, University of Pennsylvania; acting sec.-treas., G. Malcolm Laws, Jr., University of Pennsylvania. Representative to the AAAS Council is William N. Fenton.

■ Association for Computing Machinery: pres., John W. Carr, University of Michigan; v. pres., Richard W. Hamming, Bell Telephone Laboratories, Inc.; sec., Jack Moshman, Council for Economic and Industry Research, 734 15th St., NW, Washington 5, D.C.; treas., Charles Concordia, General Electric Company. Representative to the AAAS Council is Alston S. Householder.

Forthcoming Events

May

28–30. Trichomonas Infestations, internatl. symp., Reims, France. (Dr. Senechal, Société de Gynécologie, 31, rue Raynouart, Paris 16e, France.)

29–2. American College of Chest Physicians, annual, New York, N.Y. (M. Kornfeld, ACCP, 112 E. Chestnut St., Chicago 11, Ill.)

30–31. American Geriatrics Soc., New York, N.Y. (R. J. Kraemer, Greenwood, R.I.)

30–31. Rheology of Elastomers, conf., Welwyn Garden City, Herts., England. (N. Wookey, British Soc. of Rheology, 52, Tavistock Rd., Edgware, Middlesex, England.)

30–1. American Acad. of Dental Medicine, 11th annual, Boston, Mass. (R. Diamond, 100 Boylston St., Boston.)

30–1. American Malacological Union, Pacific meetings, Santa Barbara, Calif. (Miss M. C. Teskey, P.O. Box 238, Marinette, Wis.)

30–1. American Ophthalmological Soc., Hot Springs, Va. (M. C. Wheelen, 30 W. 59 St., New York 19.)

30–1. Endocrine Soc., 39th annual, New York, N.Y. (H. H. Turner, 1200 N. Walker St., Oklahoma City 3, Okla.)

31–2. American Soc. for the Study of Sterility, New York, N.Y. (H. Thomas, 920 S. 19 St., Birmingham 5, Ala.)

31–2. Social Medicine, internatl. cong., Vienna, Austria. (T. Antome, Spitalgasse 23, Vienna 9.)

31–2. Society for Applied Anthropology, annual, East Lansing, Mich. (W. F. Whyte, New York State School of Industrial and Labor Relations, Cornell Univ., Ithaca, N.Y.)

June

1–2. American College of Angiology, annual, New York, N.Y. (A. Halpern, 15 E. 62 St., New York 21.)

1–2. American Diabetes Assoc., 17th annual, New York, N.Y. (ADA, 1 E. 45 St., New York 17.)

1–2. Soc. for Investigative Dermatology, annual, New York, N.Y. (H. Beerman, 255 S. 17 St., Philadelphia 3, Pa.)

1–9. International Cong. on Medicine and Surgery, Turin, Italy. (Secretariat, Minerva Medica, Corso Bramante 83–85, Turin.)

2–6. Air Pollution Control Assoc., golden anniversary, St. Louis, Mo. Jointly with American Meteorological Soc., American Soc. of Heating and Air Conditioning Engineers, American Inst. of Chemical Engineers, and American Soc. of Mechanical Engineers. (H. C. Ballman, APCA, 4440 Fifth Avenue, Pittsburgh 13, Pa.)

2–7. Society of Automotive Engineers, summer, Atlantic City, N.J. (Meetings Division, SAE, 29 West 39 St., New York 18.)

2–8. International Cong. of Photobiology, 2nd Turin, Italy. (G. Matli, Istituto di Fisica dell'Universita di Torino, Via Pietro Giuria 1, Corso Massimo d'Azeglio 46, Turin.)

3–5. American Soc. of Refrigerating Engineers, Miami Beach, Fla. (R. C. Cross, ASRE, 234 Fifth Ave., New York 1.)

3–5. Chemical Inst. of Canada, 40th annual, Vancouver, B.C. (CIC, 18 Rideau St., Ottawa 2, Ont.)

3–7. American Medical Assoc., annual, New York, N.Y. (G. F. Lull, AMA, 535 N. Dearborn St., Chicago 10, Ill.)

3–7. American Soc. of Civil Engineers, Buffalo, N.Y. (W. H. Wisely, ASCE, 33 W. 39 St., New York 18.)

3–7. Hospital Cong., 10th international, Lisbon, Portugal. (J. E. Stone, 10 Old Jewry, London, E.C.2, England.)

3–8. Microbiological Inst., 10th annual, Lafayette, Ind. (C. L. Porter, Dept. of Biological Sciences, Purdue Univ., Lafayette.)

3–12. Quantitative Biology, 22nd Cold Spring Harbor Symp., Cold Spring Harbor, N.Y. (B. Wallace, Biological Laboratory, Cold Spring Harbor.)

4–9. Blood Circulation, international symp., London, England. (D. G. James, c/o 11 Chandos St., London, W.1.)

5–7. Therapeutics, 5th international cong., Utrecht, Netherlands. (F. A. Nelemens, Bureau Provisoire, Vondellaan 6, Utrecht.)

6–7. Production Techniques, 1st natl. symp., IRE, Washington, D.C. (A. A. Lawson, Melpar, Inc., 3000 Arlington Blvd., Falls Church, Va.)

6–8. National Soc. of Professional Engineers, Dallas, Tex. (P. H. Robbins, NSPE, 2029 K St., NW, Washington 6, D.C.)

6–8. Nuclear Structure Conf., Pittsburgh, Pa. (N. Austern, Radiation Lab., Univ. of Pittsburgh, Pittsburgh.)

8–11. American Planning and Civic Assoc., annual, Little Rock, Ark. (Miss H. James, APCA, 901 Union Trust Bldg., Washington 5.)

8–13. X-Ray Technicians, internatl. convention, Washington, D.C. (Miss M. A. Snyder, 1165 W. Water St., Elmira, N.Y.)

9–12. American Inst. of Chemical Engineers, Seattle, Wash. (F. J. Van Antwerpen, AIChE, 25 W. 45 St., New York 36.)

9–13. American Rocket Soc., semian-

nual, San Francisco, Calif. (J. J. Harford, ARS, 500 Fifth Ave., New York 36.)

9–13. American Soc. of Mechanical Engineers, semiannual, San Francisco, Calif. (C. E. Davies, ASME, 29 W. 39 St., New York 18.)

10–12. American Nuclear Soc., 3rd annual, Pittsburgh, Pa. (W. W. Grigorieff, ANS, P.O. Box 963, Oak Ridge, Tenn.)

10–12. Canadian Soc. of Microbiologists, annual, London, Ont., Canada. (J. A. Carpenter, Dept. of Bacteriology, Ontario Agricultural College, Guelph.)

10–14. Molecular Structure and Spectroscopy Symp., Columbus, Ohio. H. H. Nielsen, Dept. of Physics and Astronomy, Ohio State Univ., Columbus 10.)

10–14. Technical Writers' Institute, 5th annual, Troy, N. Y. (J. R. Gould, TWI, Rensselaer Polytechnic Inst., Troy.)

11–13. American Meteorological Soc., Monterey, Calif. (K. C. Spengler, AMS, 3 Joy St., Boston 8, Mass.)

11–15. Ionization Phenomena in Gases, 3rd internatl. conf., Venice, Italy. (U. Facchini, Laboratori CISE, Via Procaccini 1, Milan, Italy.)

12–15. Colloquium of College Physicists, 19th annual, Iowa City, Iowa. (J. A. Van Allen, Dept. of Physics, State Univ. of Iowa, Iowa City.)

16–20. American Soc. of Mammalogists, annual, Lawrence, Kansas. (B. P. Glass, Dept. of Zoology, Oklahoma A.&M. College, Stillwater.)

16–21. American Soc. for Testing Materials, Atlantic City, N.J. (R. J. Painter, ASTM, 1916 Race St., Philadelphia 3.)

17–19. American Neurological Assoc., Atlantic City, N.J. (C. Rupp. 133 S. 36 St., Philadelphia 4, Pa.)

17–19. Astronomical Soc. of the Pacific, annual, Flagstaff, Ariz. (S. Einarsson, Univ. of California, Berkeley 4.)

17–19. Health Physics Soc., 3rd annual, Pittsburgh, Pa. (H. W. Patterson, Radiation Lab., Univ. of California, Berkeley.)

17–19. Military Electronics, national convention, Washington, D.C. (G. Rappaport, Emerson Radio & Phonograph Corp., 701 Lamont St., NW, Washington 10.)

17–20. Carbon Conf., 3rd, Buffalo, N.Y. (Carbon Conf., Univ. of Buffalo, Buffalo.)

17–20. Institute of Aeronautical Sciences, natl. summer, Los Angeles, Calif. (S. P. Johnston, IAS, 2 E. 64 St., New York 21.)

17–21. American Soc. for Engineering Education, annual, Ithaca, N.Y. (W. L. Collins, Univ. of Illinois, Urbana.)

17–21. Association of Official Seed Analysts, annual, Baton Rouge, La. (L. C. Shenberger, Seed Lab., Dept. of Agricultural Chemistry, Purdue Univ., Lafayette, Ind.)

17–21. Canadian Medical Assoc., 90th annual, Edmonton, Alberta, Canada. (CMA, 244 George St., Toronto, Ont., Canada.)

17–22. Coordination of Galactic Research, internatl. symp., Stockholm, Sweden. (P. T. Oosterhoff, University Observatory, Leiden, Netherlands.)

17–22. Internal Combustion Engine Cong., 4th internatl., Zurich, Switzerland. (C. C. M. Logan, British National Committee, 6 Grafton St., London, W.1.)

(See issue of 19 April for comprehensive list)

LETTERS

The editors take no responsibility for the content of the letters published in this section. Anonymous letters will not be considered. Letters intended for publication should be typewritten double-spaced and submitted in duplicate. A letter writer should indicate clearly whether or not his letter is submitted for publication. For additional information, see Science **124**, *249 (1956) and* **125**, *16 (4 Jan. 1957).*

Political Means

Since I am only on a leave of absence from the United States, I feel free to comment on the article concerning the resolutions of the AAAS [*Science* **125**, 280 (1957)]. I was particularly struck by the statements concerning the lack of attention which greeted the recommendations of the Radiation Committee of the National Academy of Sciences. I should think the answer would be obvious. Any group that wants to enter the political arena to obtain politically what it desires must use political means. If most AAAS members and most other scientists back the findings of the Radiation Committee, as I think they do, it does no good simply to issue reports and hope for the best.

I would recommend that, if we desire action based on the recommendations, we should lobby for it. The AAAS should bring into being a political arm, should set up a lobbying group in Washington, should see to it that its members constantly relay to the public, through meetings, talks, and propaganda, its views, and should badger the scientifically interested public to write their Congressmen and express their views.

We should not be ashamed of this activity; we scientists have as much right to try to impose our views on the public as do other interest-groups. Only in this way can we make sure that not only our own interests but what we think are the interests of the country can be forcefully brought to the attention of the legislators.

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Feedback

Referring to your editorial of 15 March, "Feedback," there is proposed the problem of applying the brakes to the inflationary competition for scientists and engineers without discriminating against the governmental employee. It is questionable whether this competition will contribute enough to inflation to counterbalance the effect the lack of competition will have on the problem of the shortage of engineers. Many young students are not entering