Meetings

Contamination of the Moon

A committee to consider the implications of contamination of the moon and planets by extraterrestrial exploration (CETEX) was established by the International Council of Scientific Unions (ICSU) in March 1958 and held its first meeting two months later in The Hague. On the basis of two days of discussions, CETEX decided that there is a real possibility that exploration experiments could contaminate the moon or the planets in such a way that other experiments, particularly biological, would be made impossible. The dangers of such contaminations, and steps to avoid them, were pointed out in the report of CETEX [*Science* **128**, 887 (1958)] which was accepted by ICSU at its general meeting in Washington in October 1958. In addition, the parent organization asked CETEX to meet for a second time, with the help of appropriate technical experts, to draw up a code of conduct for space research and to suggest the correct sequence of experiments of different types.

The second meeting was held at The Hague 9–10 March 1959, the following members being present: M. Florkin, convener (Belgium); P. Alexander (Great Britain); J. Bartels (Germany); W. O. Fenn (U.S.); D. J. Hughes (U.S.); J. Roche (France); and J. Rösch (France).

It was impossible for CETEX to prepare a detailed sequence of space experiments, principally because of the short time interval between its two meetings and the complexity of the problems involved. Instead, it drew up some general principles governing space exploration that could serve as suggestions to COSPAR, the newly organized space research committee of ICSU, which presumably will include the work that CETEX has begun. These general principles are given below. Although the first report of CETEX was considered in detail at the second meeting, primarily only minor changes of a technical nature were made in it. The committee reaffirmed its position that the presence of life of any type on the moon is extremely unlikely and decided, as well, that the possibility that free radicals in explosive amounts exist on the moon is remote. A suggestion was added to the report that methods for sterilization of rockets be developed as rapidly as possible, and that sterilization be instituted as a standard procedure.

The general principles governing space research drawn up at the meeting are as follows.

"1) Space research offers a challenge and opportunities which should appeal to the most imaginative minds. The greatest encouragement must be given to novel and unconventional approaches and no proposal should be sanctioned which would hamper the experimenters' freedom of action unless there are compelling reasons. On the other hand, equally imaginative thinking is required when considering possible complications which can follow a particular type of experiment. Surprises are certain and unlikely possibilities must be borne in mind when dealing with the problem of contamination, which is better defined as the problem of reducing the risk whereby one experiment may spoil the situation for other subsequent enquiries. The question of deciding whether such a conflict is likely to arise can best be dealt with by a committee or working group engaged in planning, or advising on scientific experiments.

"2) Ideally scientists should be asked to inform COSPAR as early as possible of each space experiment which is envisaged and of the methods to be used in its execution. The broadly based committee of COSPAR containing scientists

from all disciplines may be able to see much more clearly than the space research specialists possible conflicts introduced by such experiments and may be able to suggest ways of overcoming these difficulties.

"3) There are a number of obvious and necessary experiments which are bound to be done and here the COSPAR working group dealing with experiments may be able to suggest priorities. While it may not be possible to avoid all types of contamination a proper sequence can ensure that the collection of data is not thereby hindered. For example CETEX recommends positively that no 'soft' landing, which requires the release of large quantities of gases, should be made on the moon until experiments have been successfully carried out—or at least all reasonable attempts made—to determine the nature of the moon's atmosphere.

"4) In view of the great uncertainties which face space research all operations which are not capable of conveying meaningful scientific data are to be discouraged even if they do not appear to carry with them a known source of contamination. Risks with the unexpected must be taken as otherwise no space exploration is possible but such risks must be justified by the scientific content of the experiment."

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Forthcoming Events

September

1–3. Association for Computing Machinery, natl., Cambridge, Mass. (J. Moshman, Council for Economic and Industry Research, Inc., 1200 Jefferson Davis Highway, Arlington 2, Va.)

1–6. College of American Pathologists, Chicago, Ill. (A. H. Dearing, Suite 2115 Prudential Plaza, Chicago 1.)

1–7. History and Philosophy of Science (General Assembly, History Div., Intern. Union of the History and Philosophy of Science), Barcelona, Spain. (R. Taton, IUHPS, 64, rue Gay-Lussac, Paris 5e.)

1–8. Acoustics, 3rd intern. cong., Stuttgart, Germany. (E. Zwicker, Breitscheidstrasse 3, Stuttgart N.)

1–7 Oct. International Civil Aviation Organization (Meteorological Div.), Montreal, Canada. (ICAO, Maison de l'Aviation Internationale, Montreal.)

2–4. Allergy, 4th European cong., London, England. (British Assoc. of Allergists, Wright-Fleming Inst., St. Mary's Hospital, London, W.2.)

2–4. Cryogenic Engineering Conf., Berkeley, Calif. (K. D. Timmerhaus, CEC, Chemical Engineering Dept., Univ. of Colorado, Boulder.)

2–4. Crystal Imperfections and the Chemical Reactivity of Solids (Faraday discussion), Kingston, Ontario, Canada. (Faraday Soc., 6 Gray's Inn Sq., London, W.C.1, England.)

2–5. American Mathematical Soc. and Mathematical Assoc. of America (joint summer), Salt Lake City, Utah. (E. Pitcher, AMS, Lehigh Univ., Bethlehem, Pa.)

2–8. Foundations of Mathematics: Infinitistic Methods, symp., Warsaw, Poland. (A. Mostowski, Dept. of Mathematics, Univ. of California, Berkeley 4.)

2–9. British Assoc. for the Advancement of Science, 121st annual, York, England. (Secretary, BAAS, 18 Adam St., Adelphi, London, W.C.2, England.)

3–4. Magnesium in Agriculture, symp., Morgantown, W. Va. (D. J. Horvath, Dept. of Animal Husbandry, West Virginia Univ., Morgantown.)

3–5. Nephrology, 1st intern. cong., Geneva, Switzerland, and Evian, France. (G. Richet, Hospital Necker, 149, rue de Sevres, Paris 7e, France.)

3–6. American Sociological Soc., natl., Chicago, Ill. (D. Young, Russell Sage Foundation, New York 22.)

3–9. American Psychological Assoc., annual conv., Cincinnati, Ohio. (R. W. Russell, APA, 1333 16 St., NW, Washington 6.)

4–7. International Federation of Surveyors, annual (by invitation), Gracow, Australia. (IFS, 4, Kanaalweg, Delft, Netherlands.)

5–12. Application of Radiation Sources in Industry, intern. conf., Warsaw, Poland. (P. Fent, IAEA, Vienna, Austria.)

6–12. Standards on a Common Language for Machine Searching and Translation, intern. conf., Cleveland, Ohio. (Secretariat, Center for Documentation and Communication Research, Western Research Univ., Cleveland 6.)

6–12. World Confederation for Physiotherapy, 3rd intern. cong., Paris, France. (A. Nicolle and J. Dupuis-Deltor, Société d'Organisation des Congrès Français et Internationaux, 1, rue Chanez, Paris 16e.)

7–9. Psychometric Soc., Cincinnati, Ohio. (P. H. DuBois, Washington Univ., St. Louis 5, Mo.)

7–9. Society of General Physiologists, Urbana, Ill. (F. G. Sherman, Dept. of Biology, Brown Univ., Providence 12.)

7–10. Institute of Management Sciences, Paris, France. (A. S. Manne, Dept. of Economics, Yale Univ., New Haven, Conn.)

7–11. American Soc. of Clinical Pathologists, Chicago, Ill. (C. E. Wells, 2052 N. Orleans, Chicago 14.)

7–11. Illuminating Engineering Soc., annual natl. conf., San Francisco, Calif. (A. D. Hinckley, IES,, 1860 Broadway, New York 36.)

7–12. European Soc. of Haematology, cong., London, England. (E. Neumark, Dept. of Pathology, St. Mary's Hospital, London, W.2.)

7–12. World Medical Assoc., 13th general assembly, Montreal, Canada. (WMA, 10 Columbus Circle, New York 19.)

8–15. Sociology, 4th world cong., Milan and Stresa, Italy. (Intern. Sociological Assoc., Skepper House, 13 Endsleigh St., London, W.C.1, England.)

9–10. Air Pollution, 2nd intern. cong., New York, N.Y. (American Soc. for Mechanical Engineers, 29 W. 39 St., New York 18.)

(*See issue of 19 June for comprehensive list*)