

This is one of a series of investigations involving new means of propulsion for space applications. Conceptually, this study, which was proposed by General Atomic, differs from other proposals under consideration in that it looks to the employment of a series of controlled detonations within the atmosphere and beyond. The initial commitment for this study calls for the expenditure of \$1 million during fiscal year 1959. Research will be conducted, in the main, at General Atomic's John Jay Hopkins Laboratory for Pure and Applied Science in San Diego. Continuation of the program will be based upon the results of the study during the initial phase.

### Zoological Nomenclature

The International Commission on Zoological Nomenclature has announced that, beginning 6 December 1958, it will start voting on the following cases involving the possible use of its plenary powers for the purpose specified against each entry. Full details of these cases were published on 6 June in the *Bulletin of Zoological Nomenclature* (vol. 16, part 2); (i) *Mysis* Latreille, [1802-1803], designation of type species for, and validation of neotype for species (*Cancer oculatus* Fabricius, 1780) so designated (Class, Crustacea; Order, Mysidacea); (ii) *Dactyloceras* Hyatt, 1867, designation of type species for (Class, Cephalopoda; Order, Ammonoidea: Jurassic); (iii) *gemmascens* Esper, [1794] (*Madrepora*), validation (Class, Hydrozoa; Order, Stylasterina). Comments should be sent as soon as possible in duplicate to the assistant secretary to the commission, R. V. Melville, 28 Park Village East, Regent's Park, London, N.W.1, England.

### Oil from Shale

The Denver Research Institute of the University of Denver has announced the successful operation of a pilot plant which extracts oil from oil-bearing shale at a cost which is reported to be commercially competitive. This process, should it prove capable of expansion to industrial scale, would open the nation's oil shale reserves to commercial development and greatly augment our total resources of petroleum.

A reduction in cost of up to 50 percent over other extractive processes has been reported by the institute's director, Shirley A. Johnson, Jr. In a projected source-to-market problem, this reduction would allow a producer to sell Colorado-produced oil on the West Coast for \$1.42 to \$1.92 a barrel. The current cost of crude oil produced by drilling is about

\$1.40 per barrel of medium grade, according to a major marketer.

To extract oil from shale by the new process, metal or ceramic balls—thermospheres—are heated and then run counter to a flow of finely crushed shale in a retort. This heats the shale to a point at which it releases its hydrocarbons. The resulting shale coke, which retains some of its combustible elements, is then burned in a furnace to provide heat for warming the thermospheres. This process is one of four considered feasible by experts in the field of shale-oil extraction [*Sci. Monthly* 84, 275 (1957)].

The pilot plant, which has a daily capacity of 24 tons, has been in operation for the past 9 months. The work is being done by the Denver Research Institute for the Oil Shale Corporation, owner of the Western Hemisphere rights to the process. A Swedish engineer, Olof Aspergen, holds the patent rights on the basic process.

### Grants, Fellowships and Awards

*General.* The closing date for U.S. Government awards for 1959-60 authorized under the Fulbright and Smith-Mundt acts is 1 October. These grants are for university lecturing and advanced research in Europe, the Near East and Africa, and the Far East. Application forms and additional information are obtainable from the Conference Board of Associated Research Councils, Committee on International Exchange of Persons, 2101 Constitution Avenue, Washington 25, D.C.

*Physiological Sciences.* The 21st International Congress of Physiological Sciences will be held in Buenos Aires, Argentina, 9-15 August 1959, under the sponsorship of the International Union of Physiological Sciences. The United States adheres to the International Union through the National Academy of Sciences, which has established a National Committee for this purpose. The National Committee is seeking funds to provide a limited number of allotments in support of travel to the congress for scientists residing in the United States who may require such assistance. Individual allotments will not exceed \$750 each.

Application for a travel allotment should be submitted in duplicate in the form of a letter giving information on age, training, publications, academic or professional title, and society affiliation. Applicants who plan to submit papers for presentation at the congress should include the proposed title of each paper. Such letters must be submitted *before 15 October 1958* to the Chairman, U.S.A. National Committee on the International Union of Physiological Sciences, 2101 Constitution Avenue, NW, Wash-

ington 25, D.C. Applications for assistance toward travel expenses are entirely separate from applications for registration and for the submission of papers.

*Poliomyelitis.* Deadlines of 1 September and 1 December have been established for application to the National Foundation for Infantile Paralysis for postdoctoral fellowships in research and academic medicine or in the clinical fields of rehabilitation, orthopedics, and preventive medicine. Applications for fellowships in the medical associate fields or physical therapy teaching and occupational therapy teaching should also be filed by these dates. For further information write to: Division of Professional Education, National Foundation for Infantile Paralysis, 301 E. 42 St., New York 17, N.Y.

*Social science.* The Social Science Research Council, 230 Park Ave., New York 17, N.Y., has announced that international conference travel grants equivalent to round-trip, tourist-class fare are offered to social scientists residing in the United States for attendance at meetings outside North America. These grants are offered only for meetings designated in advance by the council.

The tentative list of meetings in 1958 through 1960 follows. The approximate number of grants to be offered for each meeting is shown in parentheses: Congress of the Interamerican Society of Psychology, Rio de Janeiro, December 1958 (3); Congress of the History of Science, Barcelona, August-September 1959 (6); Conference of the International Union for Scientific Study of Population, Vienna, August-September 1959 (5); Congress of the International Sociological Association, Perugia, September 1959 (5); International Institute of Administrative Sciences, West Germany (6); Congress of the International Statistical Institute, 1959 (if held outside North America—10); International Congress of Historical Sciences, 1960 (36); Congress of the International Union of Scientific Psychology, 1960 (15).

Forms for application for travel grants will be supplied by the council on request. Applications for grants for the December 1958 Interamerican Psychological Congress will be due 15 October, and grants for this meeting will be announced as soon as possible thereafter. Applications for all meetings to be held in the summer of 1959 will be due 1 December 1958, and grants will be announced 1 March 1959 or earlier.

### Atmospheric Sciences

The National Science Foundation announced on 7 July the establishment of a Program for Atmospheric Sciences in the Division of Mathematical, Physical,