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drilling range. (A quad is an energy unit equal to one quadrillion Btu's. The United States currently consumes about 70 quads of energy a year.) Other energy specialists have concluded that the energy locked into the geothermal methane zone beneath the Gulf may total a phenomenal 105,000 quads.

The oil and gas industry is aware of the methane-laden water but has long considered it merely an expensive nuisance. The 1973 oil embargo and subsequent price increases for all forms of energy suddenly made methane commercially interesting; the hot water in which it is contained is also a potential source of geothermal power.

The technology for drilling and completing wells and separating the natural gas from the water already exists. The environmental problems arise from the probable subsidence of the land as water is withdrawn and from the need to dispose of great quantities of hot salt water drawn from the earth.

A Lawyer Looks At Outer Space

"Earth Exposure to Martian Matter: Back Contamination Procedures and International Quarantine Regulations" by George S. Robinson, in *Columbia Journal of Transnational Law* (vol. 15, no. 1, 1976), Box 8, School of Law, Columbia University, New York, N.Y. 10027.

As the Soviets demonstrated with their unmanned lunar program, the technology exists to recover soil samples from alien planets by means of unmanned spacecraft. NASA is now planning a Mars Surface Sample Return mission; by the early 1980s, the earth's biosphere could be subjected to extraterrestrial organisms with the potential for creating a serious "biological accident," according to Robinson, assistant counsel of the Smithsonian Institution and author of the first interdisciplinary study of the scientific, legal, and administrative steps taken by the United States to protect the earth's biosphere from extraterrestrial contaminants.

With space exploration evolving almost totally for reasons of national prestige and commercial exploitation, it is not at all clear that the legal problems involved in warding off biological contamination can be resolved in an international forum before the first NASA launch date in 1980. For one thing, quarantine and its application to persons (e.g., an astronaut exposed to contamination while conducting earth orbital space-lab tests of Martian material) "can shatter the integrity of basic provisions in the United States Constitution if authority to quarantine is not drafted with care and precision," says Robinson. What official, for example, has authority to apprehend, detain, and quarantine indefinitely a person exposed to Martian matter?

Since Martian contaminants would first be introduced into international airspace and waters, the United States should take the lead

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in establishing a multinational agreement dealing with space activities and quarantine protocol, jurisdiction, legislation, and regulations. Robinson offers a detailed draft agreement which, as a minimum, forces communication among interested parties.

*A Pessimistic Look
At Nuclear Terror*

"Nuclear Sabotage" by Michael Flood, in *Bulletin of the Atomic Scientists* (Oct. 1976), 1020-24 E. 58th St., Chicago, Ill. 60637.

If terrorism is partly theater, then nuclear terror makes for gripping theater. Flood, a chemist at the University of London, predicts increasing threats to nuclear power facilities by terrorists bent on blackmail and public attention.

No nuclear installation has yet been sabotaged in such a way as to release radioactivity, but Flood lists a total of 11 attacks, mostly bombings, against nuclear installations and facilities in the United States and abroad since 1969. Another 23 threats and hoaxes were directed at facilities in the United Kingdom between 1966 and 1975. More than 175 such threats were aimed at similar installations in the United States, including one by a hijacker who, on Nov. 12, 1972, vowed to crash a plane into the experimental reactor complex at Oak Ridge, Tenn. There have also been more than 100 acts of vandalism and sabotage at nuclear plants in this country.

SOCIETY

*On the Trail of
The Livable City*

"The Limits of Suburban Growth" by David R. Goldfield, with comments by Joseph Zikmund and Jeffrey K. Hadden, in *Urban Affairs Quarterly* (Sept. 1976), Sage Publications, Inc., St. George's House, 44 Hatton Garden, London EC1N8ER.

The city-to-suburb exodus that marked the 1960s may have ended with revitalized cities luring back former residents and even attracting a few in-migrants, writes Goldfield, professor of environmental and urban systems at the Virginia Polytechnic Institute and State University.

Using the Washington SMSA (Standard Metropolitan Statistical Area) as a model, Goldfield bases his conclusions on four premises: that with birth rates declining and more women entering the job market, there will be an increasing demand for affordable, high-density dwellings; that inflation, high interest rates, and climbing construction