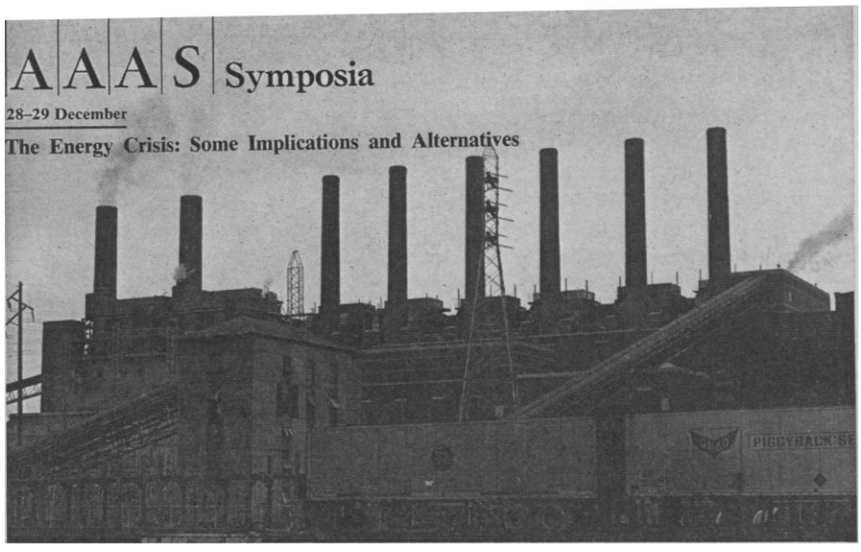


Electric power generating facilities. [Paul J. Stamler, Washington University]

Many signs indicate that the United States is faced with an energy crisis. On the one hand, there is the historic growth trend of energy consumption, which has been doubling every 8 to 10 years. On the other hand, there is growing public concern with the environmental and social consequences of producing that much energy and, further, of the social value of using it. Public concern has been expressed in many communities regarding the construction of power plants and transmission facilities; such concern promises to intensify in the future. There is an obvious need for the relevant scientific data, and for public understanding of them. The symposium is intended to help meet this need.

Initially, one can either accept or reject the projection obtained by extending the consumption patterns and trends of the past; this establishes the basis for defining energy "demand." When this demand is determined, one may then choose among the various means of energy conversion which are conventional at present or which are in some stage of development. This requires an evaluation, for each means of power generation, of the available fuel resources, the environmental impact, and the relation to relevant economic and social issues. However, all of these considerations are themselves influenced by assumptions regarding future demand for power, and these, too, must be reexamined. For example, by analyzing the various components that presently constitute energy demand, various alternatives can be devised to maximize social return per unit of energy consumed. In turn, such alternatives may have important implications for the economic system, for social processes, and for life styles. The foregoing considerations define issues to be examined in the symposium.

The symposium is sponsored by the AAAS Committee on Environmental Alterations, which, in collaboration with the Scientists' Institute for Public Information, has been preparing a report on the subject. The symposium is made up of four sessions which will be held on 28 and 29 December. The general format provides for relatively short papers (20 or 30 minutes) each followed by questioning from the platform. Following the formal papers, there will be approximately one hour of discussion between participants and audience.

28 December

Nuclear Power: Expectations and Implications

Participants: Dean E. Abrahamson, Chairman (Center for Studies of the Physical Environment, University of Minnesota); Arthur Tamplin (Lawrence Radiation Laboratory); Milton Shaw (U.S. Atomic Energy Commission, Washington, D.C.); William Hambleton (Kansas State Geological Survey, University of Kansas); Theodore Taylor (International Research and Technology Corp., Washington, D.C.); Daniel Ford (Harvard University).

Milton Shaw and Arthur Tamplin will review the entire nuclear program, emphasizing unresolved problem areas and the environmental and social implications of generating power through nuclear processes. Theodore Taylor will address the questions of safeguards and physical security, and will discuss the storage of high-level radioactive wastes such as that proposed for salt mines in Kansas. Daniel Ford, an active member of the Union of Concerned Scientists, a group which has recently conducted an independent evaluation of possible reactor accidents, will discuss that aspect of nuclear power generation. William Hambleton will talk on storage of high-level radioactive wastes.

Fossil Fuels—Today and Tomorrow

Participants: Arthur Squires, Chairman (The City College, New York City); Jack O'Leary (Washington, D.C.); Harry Caudill (Whitesburg, Kentucky); Hoyt Hottel (M.I.T.); Thomas Stauffer (Harvard University).

Jack O'Leary will review the overall implications of a greatly expanded reliance on fossil fuels, considering both today's technology and that which is anticipated for the decades ahead. Hoyt Hottel will consider coal gasification, Harry Caudill will discuss the social and environmental implications of mining—particularly surface mining in Appalachia, and Thomas Stauffer will consider the strategic and financial implications of importing hydrocarbons.

29 December

Technological Alternatives

Participants: James Fay, Chairman (M.I.T.); C. John Banwell and Tsvi Meidav (Resources and Transport Division, United Nations, New York City); R. Baillie (University of West Virginia); Richard Tybout (Ohio State University).

This session is to explore the present status and prospects for several technological alternatives available as energy sources or energy conversion means. Each speaker will describe the energy source, give a status report on its present implications, and discuss the relevant research and development. John Banwell and Tsvi Meidav will discuss geothermal energy, Richard Baillie will consider the fuel potential of trash and rubbish, Richard Tybout will review solar energy, and a fourth speaker will talk about controlled fusion.

Reducing the Need for Power

Participants: S. David Freeman, Chairman (Twentieth Century Fund, Washington, D.C.); Barry Commoner (Washington University); Herman Daly (Louisiana State University); Richard Stein (Architect, New York City); John Todd (New Alchemy Institute, Woods Hole, Mass.).

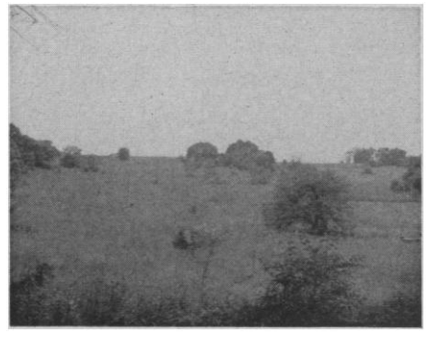
The final session is to explore various means through which substantial re-

ductions in power use might be effected or which could be implemented should a scarcity of power develop. Barry Commoner will consider the ecological importance and social implications of reducing reliance on power-intensive production technologies. John Todd will discuss biotechnic decentralization as an alternative to the energy crisis; Herman Daly will consider the economic implications of a scarcity of energy; and Richard Stein will review the implications of energy use and need from the standpoint of the architect.

DEAN E. ABRAHAMSON
University of Minnesota Medical School, Minneapolis 55455

29 December

Geological Implications of Solid Waste Landfill



(Left). Well-managed sanitary landfill operation. (Right). Restored landfill area ready for new development. Trees were retained.

Domestic and industrial solid wastes are being produced at an ever-increasing rate. Every method for disposal of this by-product of our highly productive society is encountering objections with the gradual awakening of an environmental conscience in the public mind. With a concern for air pollution, incineration in major metropolitan areas is under attack; even incineration at its best leaves a residue which requires disposal. Open dumping and burning, common methods for handling solid waste disposal, are under attack for health and esthetic reasons.

In response to the recognized shortcomings of other methods of solid waste disposal, the utilization of solid wastes for sanitary landfill has been the fastest growing technique in the last decade. A landfill is a man-made geologic deposit with rather unique physical and chemical properties. Its composition is strikingly inhomogeneous, as is its particle size. The rate of compaction-settling is extremely high in comparison with natural geological sediments. The porosity and permeability of solid waste landfills vary within wide limits and the leachate which seeps forth is frequently a biological and chemical contaminant.

The scheduled symposium on "Geological Implications of Solid Waste Landfill" is dedicated to the principle that "Out of sight, out of mind" is no longer an acceptable basis for getting rid of solid wastes in the ground. Geologists, hydrologists, planners, and landscape architects will address themselves to the definition and recognition of the extent to which various geologic and hydrologic conditions in the ground favor or limit the selection of solid landfill waste disposal sites. There has also been developing a new expertise in the physical and chemical effects of the landfill waste materials upon the sites themselves. The symposium will highlight many of the findings and parameters developed by leading researchers in this contemporary field.

Speakers and Topics

D. A. Stephenson, *What To Do before the Garbage Truck Arrives.*

S. Jackson Hubbard, *Design of a Sanitary Landfill.*

Norbert B. Schomaker, *Construction Techniques for Sanitary Landfills.*

George M. Hughes, *Hydrogeologic Controls on the Movement of Leachates from Refuse.*

Richard R. Parizek and Donald Langmuir, *Management of Leachates from Sanitary Landfill.*

Grover H. Emrich, *Management of Hazardous Geologic Conditions for Safe Solid Waste Disposal.*

Gary L. Merritt and William C. Bucciarelli, *The Geologic Aspects in the Planning and Implementation of the Pennsylvania Solid Waste Management Act 241.*

Edwin G. Otton, *Solid Waste Disposal in the Geohydrologic Environment of Maryland.*

W. L. Fisher and L. F. Brown, Jr., *Geologic Evaluation of Sanitary Landfill Sites, Texas Coastal Zone.*

ARTHUR A. SOCOLOW
State Geologist and Director, Pennsylvania Topographic and Geological Survey, Harrisburg 17120

29–30 December

Living Systems: Synthesis, Assembly, Origins

Several approaches to the artificial production of living systems will be reviewed in this symposium. Attention will be focused on systems and on the supporting levels of cellular construction, especially the relevant macromolecules.

Principal topics to be covered first are the chemical synthesis of contemporary proteins (K. Hofmann, University of Pittsburgh) and nucleic acids (M. Caruthers, M.I.T.). The assembly of such macromolecules into systems is emphasized through reports on experiments with polymers from living systems. Many biomacromolecular preparations have been reassembled into organelles (D. J. Kushner, University of Ottawa); nuclei and cytoplasms of amoebas have been transferred from one membrane to another (J. F. Danielli, State University of New York at Buffalo); and models of primitive macromolecules (R. Lohrmann and R. Sanchez, Salk Institute; and D. L. Rohlfing, University of South Carolina) and of primordial cells and organelles (S. W. Fox, University of Miami)