was also low on manpower. Although they claimed to have fielded about 100 activists, a head count on any given day might have come closer to 25 or 30. Moreover, SESPA has not only lost vigor, but—if the attitude of liberal anthropologist Margaret Mead is any indication—it has also alienated some important allies. In casual conversation, she said she is still sympathetic with SESPA's basic aims. "But they haven't developed, they haven't matured. You still see the same faces and the same placards. They are not recruiting anyone, and they're not going to get anywhere with this kind of arrogance. It's counterproductive."

Indeed it may have been, for the tribulations of SESPA overshadowed a more sober expression of protest at the AAAS meeting by several prominent scientists distressed at the renewed bombing of North Vietnam. In a news conference of their own, the scientists —among them Yale biologist Arthur Galston and University of Montana zoologist E. W. Pfeiffer—released a letter to President Nixon deploring in particular the technique of "carpet bombing" with B-52's in populated areas. The scientists said the letter would be circulated through the AAAS meeting in the form of a petition. Among signatures already on the letter were those of liberal Nobelists George Wald of Harvard, Salvador Luria of M.I.T., and Albert Szent-Györgyi, of the Wood's Hole Marine Biology Laboratory.

Pfeiffer, who is a member of the AAAS governing council, said he had introduced a resolution to the council calling for a wide-ranging study of the overall effects of the war on the Vietnamese environment. The council was scheduled to act on this and other business, most notably the proposed new AAAS bylaws, on Saturday, 30 December.

An early printer's deadline caused by New Year's Day prevented coverage of the council meeting in this issue, however. A report on this meeting and events of the final day of the annual meeting will appear in the next issue.

—ROBERT GILLETTE

APPOINTMENTS

Rex E. Paulsen, former department manager, Martin Marietta Corporation, to chairman, civil and environmental engineering department, University of Denver. . . . At West Virginia University: **Arnold J. Levine**, director of sociology, Medical School, Emory University, to chairman, sociology department; **Albert S. Klainer**, associate professor of medicine and medical microbiology, Ohio State University, to head, infectious diseases division; and **William R. Moore**, associate professor of chemistry, Massachusetts Institute of Technology, to chairman, chemistry department. . . . **Atilano A. Valencia**, associate professor of education, University of Colorado, to chairman, education department, Highlands University. . . . **Elmer S. Dunsky**, former director and vice president, Chaminade Preparatory School, to chairman, education and psychology departments, Chaminade College, Honolulu.

RESEARCH NEWS

Energy and the Future: Research Priorities and National Policy

The energy problems facing the United States are only partially amenable to technological solutions. Not every new energy conversion device nor every exotic energy source needs to be developed. More significant, in the long run, will be new attitudes and policies that take into account finite resources and equitable distribution of the costs of producing energy. But it is certain that better methods of extracting energy from coal, for example, and more efficient means of using energy will be needed well before the end of the century. Heat and electricity from solar and geothermal sources may also be essential by then, as may the improved utilization of uranium resources in breeder reactors. It is not at all certain that these and other technologies will be available without more deliberate, well-funded and well-managed efforts to develop them than exist now.

How soon the technology to exploit new energy sources or to improve the use of existing sources will be available depends partly on how much money and effort are devoted to their development. Hence the extent to which technology could help to solve the larger energy problems—the conflict between environmental standards and energy needs that is exemplified by the dilemmas encountered in siting power plants, the massive waste of energy by inefficient technologies and careless practices, the balance of payments deficits, and national security worries arising from projected huge imports of oil—is related to the priorities that are adopted for energy R & D. There is now no consensus among the diverse groups clamoring for a national energy policy as to what these priorities should be. There is, however, general agreement among environmentalists, industrialists, university scientists, and government officals that the present distribution of research efforts is greatly imbalanced and that much more money for research should be spent both in industry and government. A task force established by the utility industry, for example, recommended research funding of more than $1 billion per year for electrical energy alone, an amount nearly double existing outlays.

The earlier articles in this series have focused on specific technologies for supplying energy and on the "technology" of energy conservation. These necessarily brief assessments have nonetheless indicated that the state of knowledge concerning many of these technologies is rudimentary and that few are free from potential environmental problems and substantial engineering difficulties. At the same time many clearly have high potential for contributing to the resolution of current and prospective energy problems, and many deserve to be investigated far more seriously than present R & D patterns—largely the result of historical precedents, such as the wartime development of nuclear energy by the government and past legislative biases toward oil—or traditional funding mechanisms make likely. This final article discusses R & D priorities. A useful starting point is to consider the