

Section I

DIRECTOR'S STATEMENT

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The concept of technology assessment originated in 1966 as a congressional response to the growing need for considered, guiding analyses of the intricacies of complex issues presented by this technology dependent age. The mechanism evolved through painstaking deliberation to become the Office of Technology Assessment in 1972. It has been the intention of the OTA Congressional Board, and my primary goal as the first Director of OTA, to build this office into an institution presenting a new, important, and needed service for the benefit of the Congress of the United States.

This fourth Annual Report marks substantial progress towards that goal. It sets forth the numerous accomplishments of the OTA staff, which, assisted by advisors, contractors, consultants, and the hundreds of individuals and offices working with us, has moved OTA from a tentative, searching organization in 1973 to one which has developed a useful range of work styles, analytical strategies, and organizational techniques. The Office can now systematically and effectively marshal the intellectual resources of the Nation to meet the unique and constitutionally defined needs of Congress.

Calendar year 1976 marked the completion of 3 years of continuing development and useful service to the committees of Congress. OTA not only completed its first round of major long-term assessments, but also initiated succeeding extended projects. Each of OTA's original major program areas completed and delivered to Congress at least one major assessment report. Additional short-term studies were also completed by various program areas to serve the timely needs of congressional committees.

To capture and consolidate the benefits of 36 months of actual operation, and to ensure that upcoming activities will benefit from these initial substantive efforts, I asked that our program managers and senior staff carry out an examination and comparative analysis of their experience to date. In late summer and early fall, they met in a series of workshops for a detailed comparison of the diversity of approaches to, and experiences resulting from, OTA programs and projects across a range of assessment activities and objectives. There was particular emphasis on what worked and why, what could be improved and how, what was attempted without success, and what might have produced better results. This examination resulted in a successful effort which brought forth a theme and guiding principle we have all recognized from the beginning—that OTA is unique in its congressional inception and function. The workshops further manifested a key characteristic of successful technology assessments for Congress—a flexible structure with which to meet congressional needs.

It was generally discerned that there can be no automatically applied formula for meeting a particular study need; each effort must be carefully constructed, within the manpower, intellectual, and financial resources which can be brought to bear, to address the particular set of relevant issues. Program managers also concurred that, above all, OTA reports must be both characterized by and perceived to have the attributes of timeliness, quality, and credibility. Judging by the responses of the committees we have served, I believe our reports have indeed met these criteria of congressional utility.

From its inception, technology assessment has captured the interest of a wide spectrum of analysts and academicians in public and private organizations. The

OTA Board, as part of its continuing interest in the development and alternative uses of technology assessment, conducted hearings on the extent to which technology assessment is used by both government and private agencies. These hearings, outlined briefly in section IV, demonstrated that technology assessment is not only being used increasingly, but that it is characterized by varying approaches which can fit both the demands of the assessment's subject and the needs of the client. This characteristic and other operational techniques match those of OTA's program managers and their methods of conducting assessments.

The number of projects actively being pursued increased during the year to a high of 44, 10 major reports were delivered to and used by some 25 committees or other agencies of Congress, and work was substantially advanced on 16 other projects scheduled for delivery to Congress early in 1977.

The number of requests for assessments received since OTA's inception reached 118, covering 173 different subjects—far more than OTA can accommodate with its present resources. As a measure of expanding interest in the services and perceived utility of this office, OTA was additionally called upon by Congress for assistance in some 34 bills, two of which—on railroad safety and coal leasing—were enacted into law.

The 1976 projects treated a breadth of issues and represent the accomplishment of the original OTA program outlines. These receive mention in further detail in each of the program descriptions in section III, and to illustrate their breadth and scope a selection of brief excerpts from reports completed in 1976 appear in section II.

It is clear that early warnings on the positive and negative impacts of technology are of continuing concern to Congress. As stated in the OTA Act, it is "the basic function of the Office . . . to provide early indications of the probable beneficial and adverse impacts of the applications of technology." Early warning is a built-in aspect of most of our studies; during this year alone, the Oceans, Energy, Materials, Health, and Food Programs produced reports which contain such warnings.

The study of three new energy systems off New Jersey and Delaware noted, for example, that the development of a single floating nuclear powerplant there could lead to a profusion of similar plants in coastal areas throughout the country. Yet no policy analysis of the impacts of such a proliferation has been carried out by any responsible agency. The report also points out that, because no meaningful State participation in Federal decisionmaking exists, individual States could initiate court action to block or delay developments with which they disagree.

Reports on materials and food information systems brought into focus the need to provide policy makers with improved and integrated intelligence data to help them predict availability. The OTA examination of the Environmental Protection Agency's .5-year research and development plan noted that many influences require consideration in the development of an adequate response to environmental problems. The report said:

Inevitably, significant social, technological, and resource changes will affect the environment. While one cannot predict the nature and time of environmental crises, an exploratory research program that attempts to anticipate problems would add a worthwhile dimension to the (EPA research) program.

The OTA Health Program assessment of medical technologies was devoted almost entirely to the need for early studies of the social, economic, institutional, personal, and legal effects of biomedical R&D.

Beyond these, there was evidence at year's end that earlier OTA reports also brought out timely instances of early warning for congressional consideration. In mid-1975, the OTA study of tanker operations was forwarded, with emphasis on their pollution and safety characteristics. In late 1976, the incidence of tanker grounding and accidents brought renewed interest in this report, which had pointed out several measures which, if implemented, might have averted some of the consequences of these incidents. (As a further example, OTA's 1975 report on the effects of natural gas curtailment was updated early in 1977 to serve congressional deliberations of administration proposals to deal with natural gas shortages brought on by the severe cold of the winter of 1976 -77.)

In addition to these activities, as a continually evolving organization, OTA undertook the development of a comprehensive and systematic approach to examine, identify, and analyze technologies that have not yet been placed in widespread use. In this attempt to structure an OTA function to assess longer range, more obscure developments, the Office called upon its Advisory Council for guidance. The Council Chairman, Dr. Jerome Weisner, appointed a special Council subcommittee to work with OTA staff members in examining both the requirements for such a program and alternative structures and approaches for its implementation. Dr. Weisner's letter to the Chairman of the OTA Board, reprinted in the appendix, further outlines the important thrust and activities of this effort.

The Advisory Council also continued its comprehensive and creative work to advance the assessment of national R&D policies and priorities. These Council activities are also discussed in Dr. Wiesner's letter, while OTA program work on this is described in section 111 of this report. These Advisory Council contributions, along with many others, are appreciated.

As reflected in electoral campaigns across this Nation last fall, there is an increasing trend in this country, as well as elsewhere in the world, to involve individual citizens and groups of people, more broadly interested in or affected by particular issues, in the public policy process. As a major contributive element to the credibility of our products, OTA has encouraged public participation in its assessment activities since its beginning; in the past year, this activity reached new dimensions.

The number of persons who have worked directly with OTA in advisory or participatory capacities since its start now exceeds 1,000. These included individuals distinguished and accomplished in many relevant disciplines and professions, and represented a wide spectrum of parties affected by the technologies and alternatives that are the subjects of various OTA assessments. In addition, a regional effort to involve a large group of people in the geographical area affected by proposed technologies was completed. This OTA effort brought the views of more than 15,000 people into the assessment of coastal effects of offshore energy systems. A more widespread effort, embracing representative groups and sections covering the entire Nation, was additionally being shaped as an important contributive element to the ongoing assessment on the future uses and characteristics of the automobile.

Workshops, ad hoc panels, advisory committees, and the contributions of numerous individual consultants and contractors are a distinguishing characteristic of all OTA assessment projects. Together I believe these represent a major advancement of an interactivating mechanism broadly sought by the citizens of this country. The various uses of these elements by OTA—including testimony and the occasional working side-by-side with Members of Congress and their staffs—has developed a unique and useful avenue of communication between Congress and the

citizens of this country which not only informs the public as to what Congress is doing, but: also as to the workings of Congress itself. This I believe sustains, with new richness of meaning, Jefferson's credo that "the basis of our Government (is) the opinion of the people . . ."

The experience of 3 years of assessment activity has permitted OTA to widen its base of competence and undertake a number of projects which delve into the details of issues previously touched upon only broadly. Together with adjustments made pursuant to our workshop findings, this seasoning has permitted OTA to be more responsive to Congress, taking on a number of projects and touching on issues in new areas.

The results of OTA experience to date, its adjustments during the year, and its utility to the congressional process will be further evident throughout the pages that follow.

A handwritten signature in black ink, reading "Emilio Q. Daddario". The signature is fluid and cursive, with a large initial "E" and "D".

EMILIO Q. DADDARIO
Director