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Political Adaption to a Technology Surfeited Society

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POLITICAL ADAPTION TO A TECHNOLOGY SURFEITED SOCIETY

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I. PROBLEMS CREATED BY TECHNOLOGICAL ADVANCEMENT

IT is unnecessary to provide this audience with a catalog of all the expressions of outrage at what is happening to our environment: the wide spread meetings of indignation on Earth Day, the reaction on the Santa Barbara campus of the University of California to the spreading oil slick, the anxieties over the SST, and so on.

But not all of the criticism comes from the disaffected. For example, the National Academy of Sciences is regarded as the intellectual and scientific seat of the establishment. Yet, one recent report of an Academy panel began with a definite recognition of the responsibility of technology for the present state of the environment:

> We are living in social crisis. There have been riots in our cities and in our universities. An unwanted war defies efforts to end it. Population expansion threatens to overwhelm our social institutions. Our advanced technology can destroy natural beauty and pollute the environment if we do not control its development and thus its effects. Even while scientific progress in biology and medicine helps to relieve pain and prolong life, it raises new problems relating to organ transplants, drugs that alter behavior, and the voluntary control of genetic inheritance.[1]

Or take our national strategic posture — our military relationship vis-a-vis our number one adversary. According to Dr. Herbert York, who served as the first Director of Defense Research and Engineering during the latter years of the Eisenhower Presidency:

> Ever since the end of World War II, the military power of the United States has been steadily increasing, while at the same time our national security has been rapidly and inexorably decreasing. The same thing is happening to the Soviet Union.[2]

According to York, things have now reached such a pass that our national security depends increasingly on the reliability of Soviet electronics. He asks:

> Do they have the necessary level of sophistication to solve the contradiction inherent in the need for a "hair trigger" (so that their system will respond in time) and a "stiff trigger" (so that they will not fire

[1] BEHAVIORAL AND SOCIAL SCIENCES SURVEY COMM. ON SCIENCE AND PUBLIC POLICY, NATIONAL ACADEMY OF SCIENCES, AND THE COMM. ON PROBLEMS AND POLICY, SOCIAL SCIENCE RESEARCH COUNCIL, THE BEHAVIORAL AND SOCIAL SCIENCES: OUTLOOK AND NEEDS 1 (National Academy of Sciences, 1969).

[2] York, *ABM, MIRV and The Arms Race,* SCIENCE, July 17, 1970, at 259.

> accidentally)? How good are their computers at recognizing false alarms? How good is the command and control system for the Polaris-type submarine fleet they are now rapidly, if belatedly, building? Will it be "fail-safe"?[3]

Perhaps the most comprehensive denunciation that I encountered was in the September 26th issue of *The New Yorker,* in a lengthy article by Charles A. Reich of Yale Law School. We seem to be living, he says, in a society that no one created and that no one wants. We are engulfed in technology. The crisis, he says, is an organic one, arising out of our basic premises, and therefore beyond reform short of revolution. He tabulates seven related sets of defects:

1. Disorder, corruption, hypocrisy, war;
2. Poverty, distorted priorities, and legislation by power;
3. Uncontrolled technology and the destruction of environment;
4. Decline of democracy and liberty, powerlessness;
5. The artificiality of work and culture;
6. Absence of community; and
7. Loss of self.

Most of these appear to be attributable ultimately to technological innovations. However, Reich also declares that help is on the way. It is the revolution of the new generation. Just as industrialism produced a new man, "today's emerging consciousness seeks a new knowledge of what it means to be human, in order that the machine, having been built, may now be turned to human ends."[4]

To me it is significant that some of the same views, without the animus, are coming out of the establishment itself. When the Committee on Science and Public Policy of the National Academy of Sciences took up the study of technology assessment at the request of the Daddario Subcommittee, it described its task as exploring how the benefits of technology "might be attained with less injury to human and environmental values."[5] Said the NAS report:

> [T]he problems to which we must address ourselves are these: How can we in the United States best begin the awesomely difficult task of altering present evaluative and decision-making processes so that private and public choices bearing on the ways in which technologies develop and fit into society will reflect a greater sensitivity to the total systems effects of such choices on the human environment? How can we best increase the likelihood that such decisions (domestically and, in the end, globally) will be informed by more complete understanding of their secondary and tertiary consequences, and will be made on the basis of criteria that take such consequences into account in a timelier and more systematic way? And how can

[3] *Id.*

[4] Reich, *Reflections: The Greening of America,* THE NEW YORKER, Sept. 26, 1970, at 47.

[5] NATIONAL ACADEMY OF SCIENCES, 91st CONG., 2d SESS., TECHNOLOGY: PROCESSES OF ASSESSMENT AND CHOICE (House Comm. on Science & Astronautics, Comm. Print 1969).

> we do these things without denying ourselves the benefits that continuing technological progress has to offer, especially to the less-favored portions of the human population? [In the original, all but the first line appeared in italics.][6]

Another Committee of the Academy declares:

> Decay of the cities, deterioration of the social and physical environments, racial alienation and conflict, and poverty have led government departments and agencies on all levels to seek ways of effectively utilizing the behavioral and social sciences in coping with complex urban problems.[7]

Some of the older generation are going along with the idea that technology is inherently bad, and, that by contrast with the present, the Medieval Age was a golden age indeed. This seems to be the thrust of Lewis Mumford's current series of articles in *The New Yorker*.[8] Mesthene characterizes a 20th century Luddite view:

> [T]echnology is an unmitigated curse. Technology is said to rob people of their jobs, their privacy, their participation in democratic government, and even, in the end, of their dignity as human beings. It is seen as autonomous and uncontrollable, as fostering materialistic values and as destructive of religion, as bringing about a technocratic society and bureaucratic state in which the individual is increasingly submerged, and as threatening ultimately, to poison nature and blow up the world.[9]

Perhaps I should emphasize that this is not Mesthene's view. It is one of three *unhelpful* attitudes he has observed. The other two are an uncritical enthusiasm for all the works of technology and a relaxed attitude toward the social consequences of technology. Even so, he says, there is a measure of truth in all three.

Marianne Githins of Goucher College suggested in one of the papers presented in September before the American Political Science Association meetings in Los Angeles[10] that there is a great gap today between teachers and students of political science. As she puts it:

> Protected by their fantasies, their myths — their romantic vision — political scientists nonetheless live in a particularly grotesque age when death and degradation surround us all. Their students see the threat of mass annihilation, poverty, slums, alienation and powerlessness, inhumanity, racism, greed, corruption, and indignity. . . . Is it

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[6] *Id.*

[7] COMM. ON SOCIAL AND BEHAVIORAL URBAN RESEARCH, DIVISION OF BEHAVIORAL SCIENCES, NATIONAL RESEARCH COUNCIL TO THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, A STRATEGIC APPROACH TO URBAN RESEARCH AND DEVELOPMENT: SOCIAL AND BEHAVIORAL SCIENCE CONSIDERATIONS 1 (National Academy of Sciences, 1969).

[8] Mumford, *Pentagon of Power* (pts. 1-4), THE NEW YORKER, Oct. 10, at 50, Oct. 17, at 48, Oct. 24, at 55, Oct. 31, at 50 (1970).

[9] *Hearings on Technology Assessment Before the Subcomm. on Science, Research, and Development of the House Comm. on Science and Astronautics,* 91st Cong., 1st Sess. 363 (1969).

[10] M. Githens, Political Science: Nineteenth Century Myths and Twentieth Century Technology, September, 1970 (mimeograph).

> any wonder then that they rebel against a discipline rooted in romanticism?[11]

There are indeed defects in our system. It is also evident that an important source of these defects is related to our technology. But the point has also been made repeatedly that it is not technology *per se* that is causing the mischief but our management of it, our failures to exploit socially desirable technologies, and our inadequate screening of defective though commercially profitable technologies that combine to shape the environment that we are all so outraged about.

Technology is national in scope, national in effect, and national in its organizational instrumentalities. Yet we have no effective national mechanism for either exploiting the good or restraining the harmful. We lack national goals and priorities as standards by which to measure our innovations. Once we identify and agree upon a national goal, our progress toward it is irresistible. But so many of our national goals are in conflict that we stand frustrated and motionless. We demand an increased amount of electrical energy every year to power our air conditioners and household appliances; yet we decry the effect on the environment that results from the new power stations and transmission lines. We demand the convenience of throw away bottles and plastic containers; yet we are dismayed by the mountains of waste that we generate. We demand the efficiency of computerized information management but we are apprehensive over the invasion of privacy when personal information about ourselves finds its way into memory banks. Practically all the population growth of the nation in the past quarter century has taken place in metropolitan areas. We have formulated no clear-cut national goals for the organization, management, and design of our cities. We spend vast sums on ridding ourselves of disease but we have yet to produce a generally acceptable definition of "health." There are innumerable proposals for ways to deal with the blight of crime in our society, but we do not know what crime is, let alone how to deal with it.

It is not that we have invested too heavily in military technology. As the President has said, an investment of $40 billion in an ABM system that gave us true security would be no more than prudent. But, unfortunately, our investments in defense hardware have provided neither security, nor the motivation toward an international agreement for security. Our investments in the environment have been similarly lopsided. Last year we invested about $10 million in the Office of Coal Research and $48 million on false eyelashes. I do not question the necessity of either outlay. Nor do I suggest that there should be a fixed correspondence between them. But I do suggest that investments that benefit all the people are more difficult to make than

[11] *Id.* at 16.

investments that modestly benefit a specific individual customer. Because throw away bottles are cheaper than returnable bottles, the cities must buy more land for sanitary landfill. Persuaded by advertisements of the evils of "tattle-tale gray," the housewife accepts the unseen cost of the putrification of lakes and streams. The difficulty is compounded when both the costs and the benefits are generalized as, for example, in an investment to process municipal sewage to reduce the pollution of a large river by some modest extent.

II. Our Legal and Political Institutions

Several Presidents, most notably Eisenhower and Nixon, have attempted to formalize in the Executive Branch the process of goal setting by convening representative or knowledgeable individuals to search out and define society's most pressing needs. It has always struck me that this was the purpose of the Constitutional provision for the State of the Union messages from the President to the Congress. The President would say what needed to be done, the Congress would pass laws to have it done, and the President would then insure that the laws would be faithfully executed. Unfortunately, neither the Constitutional arrangement nor the supplementary mechanism of a goals commission has managed to keep up with the times or to deal comprehensively and rigorously with the needs of society.

One of the penalties of a democratic society is that there are always too many different ideas about what faults should be corrected first, and which ways to go about correcting them. Because this process is so slow and partial, and the stresses generated by each corrective effort are so publicly visible, it is easy to conclude, as some of our young people seem to have done, that nothing will happen for the better so let's junk the whole contraption. It has been such a long time since Hobbes and Machiavelli that the obvious alternatives are perhaps inadequately perceived. One of the important resources of our environment is the much maligned mechanism of a government that still affords us the best real hope for working together toward improvement of both the services of government and its efficiency in planning and achieving them.

The damnation of technology is no modern phenomenon. It runs throughout history. Jonathan Swift poked fun at the scientists who were trying to extract sunbeams from cucumbers. The Faust legend has been repeated in many versions. The theme appears in the *Thousand and One Nights,* in the story of the Genie and the Bottle — which the late President Kennedy used as his analogy to the spread of nuclear weapons. The Original Sin, in the Judeo-Christian tradition, reflected man's ill-advised quest for knowledge. The Greek mythology repeats the theme several times in the story of Pandora's box, the legend of

Daedalus and Icarus, and most of all in the story of Prometheus. Apparently, there have always been Luddites, and there have always been innovators who wanted to learn and outdo their predecessors. The only thing unique about our present condition is our reach. Our bombs are bigger, our pesticides more durable and destructive, and our drugs more insidious. As our skill in exploiting resources enables us to feed, clothe, and house more people, the population continues to increase. They, and the processes of civilization, are affecting our somewhat fragile environment in ways that evoke dissatisfactions. We know we are doing something wrong, but we haven't yet been clever enough to characterize what it is, nor to determine what to do about it.

What role has the law in all this? To the extent that law is a stabilizing element in the social structure, it can delimit and moderate change. To the extent that law is adaptive, it can help in the social adjustment to change. To the extent that law is creative, it can direct the course of change.

One of the fundamental criteria in political theory as to the viability of a governmental system, is its ability to accommodate itself to change. Change is inherent in all societies. There are two broad approaches to political theory, one of which recognizes that society and its environment are in perpetual change, while the other attempts to postulate a balanced and unchanging society. Plato represents the second approach, and Aristotle the first. Interestingly enough, the founders of our own republic sought to reconcile these two opposites. They borrowed from Montesquieu the idea of a balanced system with separation of legislative, executive, and judicial powers, toward a political goal of tranquility in a regime of law. They borrowed from John Locke the idea of legislative supremacy, with representatives selected democratically, toward a political goal of personal liberty and adaptation to dynamic change.

Technology imposes an ever-increasing burden of change on our society with significantly increasing power, toward both beneficial and injurious consequences. How can we define the needs of our society for change? How can we anticipate what technology is capable of doing? How can we make it work for us and not against us?

To answer these questions, we need to improve our skills in defining the needs of our society, and in measuring social changes. We need to establish national goals and argue about them, in order to reach a consensus on what is best for all of us, in both the immediate future and for the longer range. And finally, we need to recognize that too much change, too fast, is a danger to avoid. We can agree, I think, that we cannot forego change, but we need to distinguish between change as such and change that is progress. We cannot go on doubling our population, our electric power consumption, our auto-

mobiles, and the tons of raw materials each of us uses every generation in the name of progress. Sooner or later, each of these variables needs to flatten out. The problem is how to introduce rationality into the process. Do we want to?

Some changes are more dangerous or harmful than others. We should beware of irreversible changes that do us injury. Some kinds of tropical soil, when laid bare to the sun, turn to hard rock. Even in our own country, we are turning 3,000 acres per day from agricultural land into suburban developments, some of it the most productive of all our cropland. By carelessness we have set more than a hundred of our coal mines on fire, to burn and waste, and pollute the air, until they eventually burn themselves out. Some have been burning since 1900 or before.

Those who think that technology can be reversed should explore what the implications of such a reversal would be. Take farming, for instance, the vigorous application of technology to farming enables a farm population of perhaps 5 percent of our total population to feed all the rest. Of all the farms managed by that portion of the population, the top 3 percent outproduces the bottom 78 percent. Only by large investment in agricultural hardware and chemicals can these large farms succeed. And only thus can mankind have the leisure to do other things — like make automobiles, attend college, or design computer software. In 1800 it took 56 hours to produce an acre of wheat. Today it takes 2 hours. In 1800 it took 344 hours to produce 100 bushels of corn. Today it takes less than 4 hours.[12]

It is not my contention that one level of technology is necessarily better than another. I merely observe that it has been the verdict of our society to go that route, and, having once chosen it, we cannot easily reverse the decision. We are not only stuck with the decision, we are obliged to continue to improve our technology.

Professor Reich takes the corporate society to task for its role in destroying the essential values of the American society,[13] but I submit we are all at fault. If our countryside is marred by the litter of signboards, should we blame the 3-M corporation for putting up the signs, the land owner for accepting rental on his property, the consumer for responding to the display, or all of them? We complain because the American automobile is oversized and overpowered. But when Chrysler tried to give the customer a smaller car, which Chrysler's planners thought the public *ought* to want, the result was a near disaster for the company. Then, when the company deliberately went to the other extreme with a long and bloated body, the sales results were spectacularly favorable. Similarly, Ford experimented with safety as a sales

[12] *See e.g.*, E. HIGBEE, FARMS AND FARMERS IN AN URBAN AGE 8-11 (1963).

[13] Reich, *supra* note 4.

gimmick, only to discover that it did not sell cars. Though we kill 55,000 people a year on the highways, injure another two million, and do 10 or 15 billion dollars worth of damage, we apparently regard these general costs as reasonable in exchange for the privilege of having our own private transportation. But we would not (so it is believed on the basis of the experience of Ford) be willing to pay a few extra dollars to reduce the danger of accident by some small increment.

One student suggests that a confrontation between technology and the law is in prospect.[14] Traditional law, he says, operated to deny change, while public law and administrative law served to implement public policies "spawned by scientific-technological developments."[15] Constitutional law concerned the individual, but today, thanks largely to technology, *"the fundamental unit of the political order is now the social group."*[16] Furthermore, he says,

> Science and technology, by contributing to the growth of large business units, have helped to establish a system of private centers of political power — private governments, in other words. The giant corporation is a private government because it: (a) makes decisions of national or social importance; (b) acts in concert with government; (c) acts as an agency of administration for government; and (d) has a political order in its internal operations.[17]

In this connection, there is a rumor around Washington that one of the larger aerospace companies offered to contract to manage the administration of the federal government. If true, I am sure it was an unsolicited proposal. This apochryphal episode dramatizes the observation that the distinction between private and public has very nearly disappeared.

The conclusion of the author I am quoting, Arthur Selwyn Miller of George Washington University, on the confrontation of law and technology, is that:

> Scientists and technologists cannot do the job of engineering proper social change. . . . Heretofore . . . the legal profession has gladly — blindly — helped to make the American commitment to technology irresistible, irrevocable, and irreversible. [Legal education prides itself on being non-normative.] The law schools have failed and the lawyers have failed to meet the challenges of social change brought on by science and technology.[18]

III. TECHNOLOGY ASSESSMENT

Considering that the public investment over the past decade in research and development totalled $170 billion, a reasonable case can

[14] Miller, *Science Challenges Law,* 13 AMER. BEHAVIORAL SCIENTIST (1970).
[15] *Id.* at 586.
[16] *Id.* at 587.
[17] *Id.* at 588.
[18] *Id.* at 592.

be made that the public has an interest in insuring that the results of this investment are used in the public interest. But how well has this interest been served? What, for example, have been the contributions of the academic community to help in the orderly accommodation of our society to the changes wrought by technology? Back in 1945, the social scientists told the Congress that "for every important mechanical invention that physical scientists make there is created a new social problem on which social scientists should work."[19] How well have they worked on these problems? What problems have they identified and worked on?

Over the past years, there has been considerable interest in something called "technology assessment." Although it had its inception as a concept in a congressional office, it has been taken up in quite a few academic centers with enthusiasm. There have been courses, seminars, invited lecturers, and even a few research contracts, dealing with it. Many views have come forth. For example, Milton Katz calls for "therapeutic deterrence" by law, to prevent the emergence of harmful technologies.[20] Freeman Quimby finds that the public has difficulty in responding rationally when the choice is between a position supported by a scare campaign and a position supported by objective technical information.[21] John Platt urges that to meet the challenge of change, all scientists must unite and mount an all-out research study with the utmost urgency to solve the problems technology has created.[22] Harold Green proposes reliance on the adversary process, and holds that mission agencies cannot assess the merits of the technologies that relate to their own missions.[23] Gene Lyons suggests the need for a constituency in support of the assessment function. He would create this by requiring that an assessment agency issue an annual report of its findings as a sort of banner to attract all men of good will. Hugh Folk questions whether any form of political assessment is feasible, suspects motives of all politicians and scientists, and suggests as an alternative the mustering of intellectual forces of the academic community for this purpose.[24] Leon Green warns that technology assessment is likely to turn into technology harassment, but at the same time points out that the public's willingness to accept a shoddy and second-

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[19] H.R. Doc. No. 91-137, 91st Cong., 1st Sess. 108-111 (1969).

[20] This comment can be found in HOUSE COMM. ON SCIENCE AND ASTRONAUTICS, 91st CONG., 2d SESS., TECHNOLOGY ASSESSMENT: ANNOTATED BIBLIOGRAPHY AND INVENTORY OF CONGRESSIONAL ORGANIZATION FOR SCIENCE AND TECHNOLOGY (Comm. Print 1970).

[21] *Id.*

[22] *Id.*

[23] *Id.*

[24] *Id.*

rate technology has contributed considerably to the present unsatisfactory state of affairs.[25]

Ed Wenk describes the specifications for an implementing institution of technology assessment in these words:

> Who says what is or is not wanted and how? And how do we provide a focus for expression of a full spectrum of social and environmental values which need to be taken into consideration? Here, we immediately recognize the complexities arising from our pluralistic society, with its rich variety of interests, the need to identify candidate values and the need to establish priorities. Science and technology, however, have no built-in moral purpose [or] guidance system. In my view, machinery in relation to technology assessment is thus required — to serve as a mirror and lens of social needs and wants, and an institutional synthesis of science and the humanities by which policy can be interpreted. Such machinery must be independent of special private interests, and also of interests of the Federal bureaucracy and independent of partisan politics.[26]

Various proposals have been offered for ways to assess the results of technology: the establishment of an independent commission, a board responsible to the Congress, an agency in the Office of Science and Technology (which is a part of the Executive Office of the President), a division of the National Science Foundation, various assessment units in existing mission-oriented agencies of the government, and others.

The most elaborate concept was that offered in house bill H.R. 18468, by Representative Daddario. It was revealed after an extensive program of studies, discussions, and hearings. It proposed a network of assessment functions and agencies, including a technology assessment to provide early warning of consequential impacts of technology, the use of the Legislative Reference Service as a research arm, and the designation of the National Science Foundation as an additional research service in support of the proposed Office of Technology Assessment.

Under the Daddario concept, assessments would be initiated by any chairman of a congressional committee, by the Technology Assessment Board, or by the Director of the Office of Technology Assessment. A companion bill was introduced in the Senate, S. 4085, on July 15, by Senator Allott of Colorado, with five co-sponsors.

No action has been taken on the Daddario proposal in either House of Congress, during the present session. Possibly it is too advanced to be politically acceptable to our present decisionmaking organization. It may be that it overstresses the technological aspects of issues and gives insufficient recognition to the political factors. Several of the witnesses who testified on the Daddario bill last spring

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[25] *Id.*

[26] *Hearings on H.R. 1704-6 Before the Subcomm. on Science, Research, and Development of the House Comm. on Science and Astronautics*, 91st Cong., 2d Sess. 105 (1970).

before the House Subcommittee on Science, Research, and Development of the House Committee on Science and Astronautics, pointed out that it was a major political invention and that inventions in the social sciences take a long time to evolve toward workability. There was generally a tendency to try partial measures and to refine them, bit by bit, toward a new conceptual design. This may be what is happening.

IV. The Ultimate Decision Lies in Congress

It is a truism that few Congressmen are scientists and few scientists become Congressmen. Traditionally, most members of the Senate and the House of Representatives are generalists — more often than not, attorneys by training and previous condition of servitude. Yet they are called on to decide hundreds of questions every year that involve highly technical issues and information. As generalists, they need technical assistance. How do they get it?

One way is by sheer exposure. By the time a member has earned the seniority to become chairman of a committee, he has had one or two decades of exposure to the technical matter of that committee. This is one main reason why the findings of committees commonly are accorded the respect and the respectful acquiescence of the congressional membership.

Another way is by the recruitment of an expert staff, both to the committees and to the individual members. An impressive array of talents, in terms of advanced academic degrees and professional experience, has been accumulated in recent years on Capitol Hill. In a recent report, I described the requirements of the congressional staff in the following language:

> The functions of the congressional staff in the collection of information bearing on a technical issue clearly imply that the staff needs to have, collectively, a demanding array of qualifications. It must be familiar with the political context of the issue, and also with the technical context. It can advantageously bring a multidisciplinary outlook into the process. It needs skills of technical analysis, and a capacity for filtering out nonessentials. A knowledge of the social organization and hierarchies of relevant technical disciplines is indispensable. Equipped with these resources, the staff is able to perform the essential functions of insuring completeness of assessment and resolution of the technical issue, which include the following elements:
>
> (1) Identification of the essential technical issue involved;
> (2) Identification of the subsidiary technical issues;
> (3) Establishment of the political importance of resolving the technical issue;
> (4) Preparation of an initial study or staff report containing appraisal, analysis, and definition of scope of the technical issue;

(5) Identification of witnesses best able to contribute information (meeting established criteria) pertinent to the technical issue;

(6) Recommendation for appropriate modes of information gathering;

(7) Participation as consultants in the process of information exchange to insure that all pertinent questions are asked and that responsive answers are received;

(8) Analysis of information received, to determine its completeness;

(9) Procurement of further required information, outside evaluations, corrected testimony, and supplementary statements;

(10) Analysis of data for interpretation and conclusions;

(11) Report on alternative possible resolutions of the technical issue, and the comparative cost/effectiveness of the preferred alternative resolution of the issue; and

(12) Securing of external policy review to filter out inadvertent staff bias.[27]

To supplement its own congressional staffs, the Congress has also provided itself with a continuing organization, the Legislative Reference Service, in the Library of Congress. Many of the LRS divisions are concerned with scientific and technical matters, but perhaps the most concentrated attention to this field is in the Science Policy Research Division, organized in 1965, and in the Environmental Policy Division, established in 1969. The assistance provided to Congress from LRS takes many forms: drafts of committee prints and reports, preparation of analysis memoranda, pro-con assessments of issues, identification of qualified witnesses, formulation of questions, and answers to spot questions. In the 1969 hearings before the Daddario Subcommittee there are ten pages of fine type that list titles of studies and reports by LRS that might be considered assessments of technology or policy studies of technological impacts.[28] The categories of these reports suggest their range: arms control, chemical and biological warfare, communications technology, computer technology, crime control, education, energy and power, environmental quality and natural resources development, food and population, health and safety, human resources development, oceanography, science policy and technology assessment, space sciences, transportation, and urban and rural development.[29]

Records of the Science Policy Research Division indicate that in 1969 this staff served 93 Senators, 342 Representatives, and 66 congressional committees or subcommittees. It prepared 15 printed reports (issued as congressional documents or prints) and made 2,829 separate

[27] *Supra* note 20, at 516-17.

[28] *Supra* note 20, at 32-42.

[29] *Id.*

responses to congressional requests for assistance. Illustrative of the questions it dealt with are the following:

(1) Can systems technology be applied to social and community problems?

(2) Does the United States need a revised and more comprehensive national materials policy?

(3) What has been the involvement of the past Congress with science and technology in its public policy aspects?

(4) What lessons of administration and procedure are to be drawn from the technology assessment conducted by a professional society on the issue of the military use of defoliant chemicals in Vietnam?

(5) What is the status of environmental science centers at institutions of higher education in the United States?

(6) What can be done to lessen the impact of crime on small business?

(7) What has been the recent development of the social sciences to support the making of public policy, to develop social indicators, to do forecasting, and to pursue research at government direction?

In a recent magazine article, Congressman Daddario called attention to the fact that the congressional function of law making has an important derivative value.[30] He wrote: "The discussion and publicizing of issues [in congressional investigation and debate] provides a means of calling them to the attention of the public and, in the course of time, motivating the public to arrive at a consensus on what should be done about them."[31] Thus, the congressional hearing, faithfully reported, is a valuable adjunct of the political process.

I suggest that the substantive nature of the business of the Congress, and the kinds of information it asks for and gets, is a practical demonstration of genuine congressional concern with the technical problems that have agitated today's youth. It is also important, I think, to recognize how complex these problems are.

Last September, in Los Angeles, I gave an invited paper on technology assessment before a panel of the Americal Political Science Association. My impression was that the audience was more interested in damning the establishment for its technological goofs, or reveling in paper utopias, than in sharing the hard problem of what to do about technology in the real world. Toward the end of the discussion period, one young man expostulated that all we were doing was talking, while

[30] Daddario, *Science, Technology, and the American Congress,* PARLIAMENTARIAN, Oct. 1970, at 253.

[31] *Id.* at 259.

he could not breathe: "Clean up the air, that's all I ask. It's as simple as that."

I doubt that Los Angeles will find it that easy. But nationally, in many very specific ways, our society is moving slowly and ponderously toward improvement — not perfection, but betterment. Last month, for example, under the leadership of Representative B. F. Sisk, the Congress took a major step toward strengthening its own sources of technical information and policy analysis by passage of an important new bill, H.R. 17654, "to Improve the Operation of the Legislative Branch of the Federal Government, and for Other Purposes." In the report on his bill issued by the House Committee on Rules, it was explained that Congress needed and would be provided with "massive aid in policy analysis."[32] For this purpose, the report continued, "we propose that Congress expand the functions and facilities of the Legislative Reference Service in the Library of Congress."[33] Then the report went on:

> LRS is renamed the Congressional Research Service to reflect more accurately the general trend of its duties. Upon request, CRS will supply committees with experts capable of preparing, or assisting in preparing, objective, nonpartisan, in-depth analyses and appraisals of any subject matter. These analyses and appraisals will be directed toward assisting committees in determining the advisability of enacting legislative proposals, of estimating the probable results of such proposals and alternatives thereto, and of evaluating alternative methods for accomplishing the results sought.[34]

According to the report the new legislation should be expected to bring about a tripling of the staff of the Service by 1975. The CRS would be authorized to ask any agency of the Executive Branch for "books, records, correspondence, memoranda, papers, and documents as the Service considers necessary." New senior specialists would be added in military affairs, science, technology, and urban affairs. The new law requires the Service, at the beginning of each session of Congress, to prepare for each congressional committee "a list of subjects and policy areas which the committee might profitably analyze in depth." In response to committee requests, the Service will perform analysis, appraisal, and evaluation of legislative proposals, as to the advisability of passage, estimated results, and consideration of possible alternatives. In addition to expanding its own staff, the Service is also authorized to place contracts for the services of individual experts and institutions to prepare studies or perform research tasks. The Service must also prepare an annual report of its activities.

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[32] H.R. REP. No. 91-1215, 91st Cong., 2d Sess. (1970).

[33] *Id.* at 16.

[34] *Id.* at 18.

V. Conclusion

In summary, we are inundated by an onrushing technology of great power, offering important opportunities for betterment and evident hazards from its defects. We dare not stop it. We do not know how to measure its effects on ourselves. We cannot foresee its effects on our society in advance. We have no standards of social progress and see no way of developing them.

There is no logical reason why we should not inhibit dangerous or injurious technologies, but we are still groping for ways to do it. We have seen that technology has a momentum of its own, and that society is willing to accept serious faults if the accompanying convenience is great enough.

Mankind has the capability of destroying itself with its technology. We can only hope that we recognize the brinks of disaster before we go over them, and learn to cooperate by backing away, when necessary.

The focus of effort is on the Congress. I have shown that the Congress is taking steps to improve its own resources for decision-making in technical issues. In our organization, the Congressional Research Service, we are already hard at work preparing to meet the heavy responsibilities that are indicated for us. The question is, can Congress effectively allocate its already overworked energies? Will it be able to design motivations to correct faulty technology and to accelerate adoption of needed innovations? Can it impose regulations adequately to inhibit further faulty technology? Can it work cooperatively in identifying and meeting national goals and priorities? And can it do all these things at a rate fast enough to restore national balance and stability?

The answer lies in the future. But I am sure that the outcome will better serve our national values of individual freedom and general welfare, if in our impetuous haste for quick fixes, we do not turn away from the institutional resources we have been improving for nearly two centuries.