

TECHNOLOGY ASSESSMENT AND CITIZEN ACTION

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## I - INTRODUCTION

It is appropriate to commence this last paper in the seminar series with a recapitulation of the points of consensus which emerged in the course of the seminar discussions.

First, is the widely accepted assumption that it is extremely important for society to find ways of undertaking technology assessments far more effectively and expeditiously than has been the case in the past. We know that technology assessments have been carried out, albeit unconsciously, from time immemorial; further that even the more official, professional assessments have been with us throughout much of the industrial revolution. Yet despite the long history of technology assessment, we know that there is a major difference in the present situation: that somehow the available assessment institutions and mechanisms are inadequate to the tasks awaiting assessment today; and we suspect that they will be even more deficient with respect to the future assessment challenges coming over the horizon. In short, we know how important and imperative it has become for society to improve its processes of technology assessment.

Second, there appears to be a consensus regarding the pervasiveness of the assessment process, and the consequent requirement for a pluralistic approach toward its improvement. We know that Congress plays a crucial part in major public assessments, but we recognize as well the essential roles played by the Executive Branch, the judicial system,

state and local governments, industry, the non-profit sector (including universities), citizens groups, and the public-at-large. While particular assessment activities may temporarily place one or more of these 'assessment arenas' in the forefront of decision making, there is no fixed hierarchy of importance which can be ascribed to these assessment arenas for all, or even most, classes of assessment decisions. Choices made by the Congress or the White House may be fraught with significance, but so are key decisions of industrial leaders, the total impact of millions of individual consumer choices, and the cumulative effect of innumerable, impartial judicial determinations.

Given this pervasiveness of the assessment process, together with our primitive state of knowledge regarding its workings, the seminars yielded a consensus concerning the need for a pluralistic, experimental approach aimed at ameliorating the process of assessment. Thus it was generally recognized that there was no panacea possible in this field, but that all assessment arenas would have to be significantly enhanced and woven together into a viable assessment system, which accorded adequate consideration to all relevant factors. In view of our sizable ignorance in this area, many of the seminar participants pointed out the need for extensive experimentation in the evolution of a more adequate assessment system.

Third, there appeared to be a general consensus regarding the desirability of performing 'total systems assessment,' insofar as possible. The emphasis here was on taking balanced account of: (a) the positive, as well as the negative consequences of technology; and (b) the secondary, tertiary, and higher order consequences, as well as the direct impacts

of technology. Moreover, the context of analysis would have to include the full range of social, economic, political, legal, and psychological factors which impinge on the technology. While it was recognized that the state-of-the-art regarding these factors left a great deal to be desired, it was generally agreed that we had to press ahead on these fronts as effectively as possible.

It was also pointed out in the seminars, however, that we could not expect a 'total systems assessment' to be followed by all analysts throughout the assessment structure. Many, if not most, assessment analysts were constrained by their limited set of organizational objectives and responsibilities to take a more parochial view of any particular assessment problem. The practical goal, therefore, was not adherence to 'total system assessment' by all participants in the assessment process, but rather that the 'total systems approach' was followed by at least some sufficiently prominent participants in the process, whose results would be adequately considered by the key decision makers with respect to that particular assessment.

Fourth, there was a general consensus that there was a need for much better, more comprehensive information to be provided to Congress, if it was to be able to make truly informed judgments regarding technology assessment. It was pointed out, of course, that the quantity of information in existence was not the problem. Frequently, in fact, the amount of information in existence far exceeded the capacity of Congressmen and their staffs to absorb it. The problem arose rather from the quality of the information and its pattern of presentation and incorporation into the system. The deficiencies in quality developed because 'total systems assessment'

was only rarely employed. The problems of presentation and incorporation stemmed from the complexities of Congressional Committee structure and the gerrymandered jurisdictional labyrinth within which issues have to seek clarification and comprehensive consideration, as well as from the unremitting pressures of special interest groups seeking to promote their own points of view through incomplete or biased assessments. (It may be noted in passing that although there appeared to be considerable consensus concerning Congress' need for better information, there was little, if any, agreement regarding the ways in which that need should be met.)

Fifth and finally, there appeared to be some measure of consensus that adversary proceedings comprised a significant aspect of the assessment process, even if the precise role and significance remained under dispute. Some seminar participants asserted that adversary proceedings -- within the legal system, between competing economic interests, between contending Congressional pressure groups, between various government agencies -- constituted the ultimate forum in which assessment decisions were reached. Others maintained that this pattern was not only prevalent, but was desirable and healthy as well. While still others, believed we should strive to reduce the adversary aspect of assessment to the minimum extent possible.

## II - NATIONAL ASSESSMENT SYSTEM

Turning from these points of consensus to the expression of my own views, I shall first sketch out my version of a national assessment system in order to provide necessary background for the examination of citizen participation.

The system I envisage would encompass all 'assessment arenas': the three branches of the Federal Government, state and local governments, industry, the non-profit sector (including universities), citizens groups, and the public-at-large. Below are brief statements of the structure and role of each of these components of the assessment process.

A -- Federal Executive Branch

Each Federal agency, to which technology assessment is relevant, should carry out its assessment function through an office or an individual reporting to the head of the agency. This does not mean that there might not be component or subordinate assessments which are carried out further down the organizational structure in the agency or department. But it does mean that, notwithstanding any assessment at lower levels, it is essential that a technology assessment activity be located at the very top of the agency so that it can independently assess the technologies which may be advocated by more narrowly oriented components of the agency.

In addition to assessment at the agency level, there must be assessment of significant matters at the White House level. Most discussion of assessment in the Executive Offices of the President has focused on the relative roles of OST and BOB, with some consideration given to the Environmental Quality Council. However, under the President's Proposed Reorganization Plan (which will presumably take effect shortly, barring a last minute veto by the Senate), I believe the following assessment organization to be more appropriate.

The Domestic Policy Council would have responsibility for significant technology assessments in the Executive Branch. According to the Reorganization Plan, this Council would consider what programs, in what

priorities, the Government should mount. The Office of Management (in which the former BOB would be incorporated) would, on the other hand, consider how best to carry out the various programs and would appraise their subsequent performance. In view of these relative roles it appears desirable for the Council to have the primary assessment responsibility, receiving staff support from the Office of Management, the Environmental Quality Council, and OST.

B -- The Congress

Assessment in the Congress is, of course, the subject of the pending Daddario bill on which hearings are currently being held. It is clear that Congress does need augmented assessment assistance, although one can dispute the organizational locus for that assistance, with powerful pros and cons associated with every alternative (i.e., Library of Congress, GAO, an independent Office of Technology Assessment). Whatever the outcome of the current bill, Congress should certainly be provided with a much strengthened technology assessment unit, which can initiate studies through its own staff or by means of contracts with outside research organizations.

C -- National Institute of Technology Assessment

In addition to strengthening its inhouse staff resources, Congress should charter an independent research organization, The National Institute of Technology Assessment (NITA). Congress should provide NITA with a long-term endowment, which is supplemented through the appropriations process. NITA should also be empowered to seek private sources of funding as available. NITA would provide a continuing, independent, prestigious organization which could carry out in-depth, 'total systems approach'



technology assessment. The input of such assessments into the Congressional process would provide an element of independent objectivity and depth of analysis which would probably not be attained through the proposed Office of Technology Assessment alone. NITA could, in fact, be a major contractor of such an Office.

D -- While it is far beyond the range of this paper to delve into assessment at the state and local level, it is clear that all tiers of government require assessment capabilities appropriate to the scope of their responsibilities.

E -- The non-profit sector of society, including the academic community, must play an important part in any effective system. Despite its resources, NITA could handle only a limited number of the issues and areas requiring technology assessment analysis. Technology is far too pervasive in our society for one major research organization such as NITA, to perform the wide range of research which is required. Full participation from the non-profit sector and academic community will be necessary for a successful national assessment system.

F -- Industry has always played a crucial role in the assessment process and will undoubtedly continue to do so. The only point to be emphasized in this connection is that industry would be well advised to expand the time scale and range of factors it takes into consideration in its assessment decisions. As political action and judicial determination increasingly internalize social costs in industry, firms will find it more to their own long-term advantage to attempt to incorporate social impact thinking in their current assessment decisions.

G -- The judicial system has always been, and will undoubtedly continue to be crucial to the evolution and operation of technology assessment processes. As has been pointed out by Milton Katz in his testimony before the Daddario subcommittee on December 4, 1969:

"I would like to emphasize one point about the assessors, who are in fact the whole business community. Whether or not they are aware of the fact, the existing legal order infuses their calculations. It is the legal order that determines which of the anticipated costs and benefits are taken into account by the enterprise and which are ignored. An electric light company, for example, which contemplates the installation of a new powerplant will treat the fuel to be consumed as a cost, but not the smoke that may pollute the surrounding air nor any waste products that may be discharged into nearby streams. The company's management may anticipate a public relations problem from the pollution. If you look hard at what they mean by a public relations problem, it appears that they have in mind a risk that an aroused public opinion may generate changes in some applicable aspect of the legal system.

"In the ordinary course of business, the company will calculate the estimated costs and benefits of the prospective installation without reference to any damage to the community caused by the smoke or other waste products. In the language of the economists, pollution of the community's air or streams through the operation of the powerplant would be a "social cost," not a cost of the enterprise; it would be an "external" not an "internal" cost.

"The economic mode of analysis is an indispensable tool for technology assessment. But I want to emphasize that the economic analysis takes for granted a particular posture of the existing legal system. Why is damage to the community caused by waste products from our hypothetical electric powerplant a "social" cost or an "external" cost? It is a "social" and "external" cost only if and to the extent that the legal system happens so to decree. The legal system can alter the incidence of a cost by recognizing a cause of action in tort against the company. A judgment in tort will transfer back to the company the cost previously suffered by the community in the form of air or water pollution.

"The judgment then converts what the economists call a "social" cost into what the economists call an "enterprise" cost. It internalizes the so-called external cost. In a similar way the legal system can maintain the incidence of a cost by declining to recognize a cause of action in tort against the company.

"Through tort law, the legal system operates directly upon the incidence of costs. Through the law of contract, the legal system may operate indirectly upon the incidence of costs. Contract law may enable the persons involved to adjust or modify the incidence of a cost by giving effect to agreements among them designed to effect such an adjustment. On the other hand, contract law may frustrate efforts of the persons involved to modify the incidence of costs by declining to give effect to agreements among them designed for such a purpose.

"In the long history of the common law in America, changes have occurred from time to time affecting the incidence of costs. Changes have also been made by legislation, such as industrial safety and accident legislation and workmen's compensation laws. Comparable changes may occur in the future in the continuing evolution of the law in response to the changing realities of American life.

"Let me take a moment to hammer the point home. When is it a good business proposition to put something on the market? From the point of view of the business enterprise, it is a sound step if the product to be marketed will make money. I want to emphasize first, that the enterprise's own estimate of anticipated income and expense takes for granted the existing provisions of the legal system; second, that the existing provisions of the legal system at any time are the result of a long evolution; and third, that the legal system in America continues to evolve. Any changes which you gentlemen may make through new legislation will become part of this continuing evolution. You would not be altering the basic structure of the legal system nor of the business system. You would be altering the incidence of costs whose incidence has been altered before in the evolution of the business and legal systems."

H -- The final element in the nation's assessment system is the essential role of citizen participation, the topic to which the remainder of this paper is devoted.

### III - THE NEED FOR CITIZEN ACTION

It is believed that the national assessment system sketched out above would afford a feasible framework of institutions and mechanisms, within which the assessment process could proceed effectively -- provided that the essential element of citizen participation is forthcoming to the extent necessary for assessment to reflect the underlying needs and demands of the society. Technology is interwoven throughout the fabric of our society; yet as widespread as is its role today, its potential range of ramifications is likely to be even more extensive tomorrow. As war is said to be too important to be left to the generals, so technology assessment is far too crucial to the shape of our future to be left to the professional assessors and the special interest groups involved, regardless of how excellent their qualifications or how altruistic their objectives may be.

The world of tomorrow will be increasingly a technological society. Technology assessment -- regardless of how recondite its details may be -- must become an integral aspect of the nation's total social, political, economic decision-making processes, in which all citizens have the opportunity to participate. Otherwise, in a technology-permeated society, it will become increasingly difficult -- if not impossible -- to maintain, much less enhance, the democratic character of our society and the quality of freedom in our lives.

Hence, citizen participation must be an absolutely essential aspect of the assessment process. There are innumerable impediments, however, which stand in the way of citizens' taking effective assessment action. These impediments fall in three interrelated areas: (1) finance,

(2) organization and motivation, and (3) information. Each is treated in turn below.

(1) Finance. With rare exceptions, individual citizens do not have the financial resources to enter deeply into the assessment process as individuals. Those who are professional experts in a particular area can often express their assessment views in the open literature, in Congressional testimony, or as expert consultants. But apart from this group (which is generally quite small relative to any particular issue), and from the even smaller group of extremely wealthy individuals who make a practice of espousing causes, individuals as such cannot play a significant role in the assessment process, except through exercising their power of choice in the operation of the market or political system.

By joining together in groups, citizens can, of course, exert a much greater influence, depending on the size of the group, its financial resources, and its cohesiveness with respect to the issues under contention. We are all familiar with the diverse conservation, environment, and consumer groups which have been proliferating in recent years, not to mention the various political action groups which have been emerging recently in response to issues such as Viet Nam, civil rights, etc.

One problem common to almost all such groups is inadequate financing; fund raising is usually a persistent problem, and much of these groups' energy and effort is generally devoted to replenishing their depleted coffers. This lack of money imposes severe limitations on the influence such groups can exert, especially vis-a-vis well-financed special interest groups with which they may be contending, either for broad public support or for Congressional decisions.

Effective citizen participation in the assessment process requires new financial mechanisms whereby such groups can obtain the necessary funds, on a continuing basis, to compete on an even-footing with the well-heeled special interests. Part IV of this paper, below, presents a specific proposal for meeting this financial problem.

(2) Organization and Motivation. The problems of launching such groups, of organizing them for effective action, and of motivating citizens to join them and to support their efforts are intimately intertwined with one another, and are all dependent on meeting the essential financial prerequisites. For example, consider the problem of motivation. This problem does not apply to the initial formation of the group, by a small number of highly motivated individuals, but rather to the difficulties involved in motivating large numbers of members to join and actively support the group's programs. Assuming that the group addresses a real need in our society and has some inherent appeal for some segment of the public, then the problem becomes one of proper promotion of the group's objectives and programs and the values associated with membership. This in turn resolves into a financial problem: if sufficient seed money is available, then an effective promotional campaign can be mounted and additional members obtained, who in turn generate additional funds.

The problem of organization is similarly dependent on financial considerations. Many such groups are reported to be relatively inept at developing a strong internal organization and at structuring their external relationships with executive agencies, the Congress, the public-at-large, or other specific groups they may wish to influence. But I suspect that whatever ineptness there may be, in fact, is probably due far more to

limitations in funds than to any lack of potential for the pragmatic exercise of power. One may certainly cite examples of highly successful efforts supported with meagre financial resources. (Ralph Nader, of course, started out by himself; and even today I doubt whether the powerful 'machine' he leads is exactly affluent, especially vis-a-vis the interests he and his adherents are opposing.) But the fundamental point, I think, remains valid: that given a group with inherent appeal to some segment of the public, the problems of motivation and organization are largely dependent on the financial resources which can be obtained.

(3) Information. While the problem of obtaining and utilizing information effectively is also dependent in large part on the availability of adequate financial resources, there are also research problems and time delays involved here which are of crucial importance. For example, one may know that the dumping of industrial wastes into bodies of water has deleterious consequences, without knowing the nature and extent of those consequences, or the relative damage contributed by particular components of the overall mix of industrial wastes. Answers to such questions, however, are frequently extremely important to the design and implementation of practicable anti-pollution programs. Yet obtaining valid answers often requires extensive research, and the research in turn entails time and money.

The difficulty of obtaining adequate information is further complicated by the fact that many of the consequences of technology, beneficial as well as adverse, do not occur -- at least sufficiently so that they can be identified -- until considerable time has elapsed, and vast resources have already been irretrievably committed to particular courses of action.

Once such resources have been so committed, powerful special interest groups are generated with the objective of maintaining and enhancing their stake in the technology under consideration.

In view of this situation, the performance of adequate technology assessment entails the incorporation of an 'early warning' capability which can identify such problems well before they arise, and before the related patterns of resource allocation have been cemented in place. The development of such an 'early warning' capability requires a great deal of additional research and experimentation in such areas as technological forecasting, social indicators, and the application of systems analysis to social and behavioral problems. Society still has a long way to go in devising appropriate 'early warning' techniques.

In addition, there is a corollary capability which must be developed if 'early warning' efforts are to prove of any avail. This is the capability to take appropriate action, after society has been duly forewarned. In certain limited areas, there are some existing mechanisms directed at this objective. For example, if a food additive is shown to induce cancer in a test animal, its use is prohibited. Similarly, if tests of new drugs show them up as ineffective, or as yielding adverse consequences which outweigh their positive effects, the drugs can be prohibited. Thus in a few areas, there are mechanisms, however imperfect they may be, for implementing the results of 'early warning' research. In the vast majority of instances, however, in which technology can impinge on society and human life, there are no adequate mechanisms for acting upon 'early warning' results. Thus, for example, if a new type of container material were developed today which research indicated would come to constitute a serious



environmental pollutant two decades from now -- after certain quantities had accumulated and certain chemical changes had occurred -- there would be no way of halting production, short of new legislation specifically aimed at that product.

Another approach to the problem would be general legislation calling for a vast expansion in government regulatory control over industrial operations and products. This would be bound to have an inhibiting effect on the rate of technological innovation and would probably dampen the overall vigor of the economy. At the same time it would go a long way toward radically altering the balance of power in the country between the Federal Government and private enterprise. In any event, it is not an approach likely to achieve widespread support and enactment in the foreseeable future.

The fundamental problem remains, however, for technology assessment to prove effective, society must have the research capability to perform the 'early warning' function, as well as the implementation mechanisms whereby such warnings can be acted upon before it is too late.

We can summarize the requirements for effective citizen action in the assessment process as follows: Society must afford existing and prospective citizens groups the opportunity to obtain adequate financing on a continuing basis. With such financing, citizens groups can motivate their potential membership to join and participate, and can organize themselves for effective action. They can also use the financial resources to obtain the necessary base of information to further their causes, supporting the performance of research when necessary. Furthermore, as the 'early warning' capability is perfected, they can assess the future consequences of current

and projected technologies. Finally, as mechanisms are developed whereby society can take prompt action in response to the results of 'early warning' research, citizens groups can come to exert the extensive influence they deserve to wield in shaping the course of the future.

#### IV - CITIZENS ASSESSMENT ASSOCIATIONS: A PROPOSAL FOR ACTION

##### A -- General

The following proposal has been designed to meet the objectives outlined above. It does not purport to be a finished end product, but is put forth as a preliminary proposal solely to serve as the basis for further thought and discussion along these lines.

The proposal calls for the establishment of Citizens Assessment Associations whose functioning would be fostered and regulated by a new Federal agency, the Citizens Assessment Administration. Through the financial mechanisms described below, the CAA's would be enabled to obtain adequate funding on a continuing basis, which would provide them with the essential financial resources required to assert significant influence in the assessment process. With this financial base, they would be able to promote their objectives and activities, motivate sufficient numbers of their potential membership group, and organize themselves for the effective exercise of influence on the assessment process. To cope with the important information requirements for effective assessment action, they would be empowered to assemble, process, and analyze information relevant to their assessment topics; and whenever necessary to conduct or commission necessary research relevant to their assessment areas.

When CAA's had accumulated and analyzed relevant information needed to perform the desired assessments, they would be empowered to disseminate the results of their assessments to the public-at-large, as well as to appropriate decision-making organizations within the society (Congressional Committees, Executive Agencies, etc.). They would thereby perform a public information function, as well as be in a position to lobby for legislation or executive regulations in keeping with their findings.

In addition, however, they would have the extremely important power to institute legal, class action proceedings against any organization or individual within the society (including agencies of Federal, state, and local government), which were making use -- or planning to make use -- of technologies whose assessments indicated detrimental consequences to the persons or interests of certain segments of the public. These functions of the CAA's, along with their facilitating mechanisms, are discussed in turn below.

#### B -- Citizens Assessment Administration

This would be an independent government agency with its Administrator reporting directly to the President. The Administrator would formulate and carry out the policies of the agency within broad guidelines laid down by a Citizens Assessment Board, whose members would be appointed by the President, and who would represent a wide spectrum of interests in American society.

The CAA would be responsible for developing criteria for, and regulating the establishment and functioning of, Citizens Assessment Associations. In addition, the CAA would administer various financial

measures (described in the section on Financing below), which would be designed to protect the viability of Citizens Assessment Associations. (Although there are many substantial differences, the relationship of the Small Business Administration to small business firms can be thought of as somewhat analogous to what is intended here.)

#### C -- Establishment and Organization of CAA's

Any group of citizens, meeting the criteria set forth by the CAA, could establish a new Citizens Assessment Association. In addition, existing non-profit organizations could be converted into CAA's, if they meet the necessary criteria. The purposes for which a particular CAA if formed could be as broad as 'protection of the environment' or as narrow as 'assessment of consumer products containing asbestos.' The specific purposes would be spelled out in the CAA's incorporation charter within guidelines established by the CAA. The initial financial support for CAA's could come partly through individual donations and membership dues and partly through foundation grants or government grants and contracts. In addition to these currently available sources of funds, CAA's would also have the new mechanism available of issuing Citizens Assessment Bonds (described below). These bonds would provide CAA's with the continuing financial stability essential to making a real impact on the assessment process. Once established, the new CAA would be empowered to use a portion of its funds for promotional purposes to sell more Citizens Assessment Bonds and to increase its membership. There could be different classes of membership and voting rights depending on whether an individual or affiliated organization made a contribution, paid dues, or purchased a CA Bond. (The CAA agency would have to regulate these matters carefully to

preclude the seizure of control of a CAA by contending economic interests, e.g., the purchase of a controlling amount of bonds in a CAA oriented against oil spill pollution by the oil industry.)

D -- Functioning of CAA's

The primary purpose of each CAA would be to perform technology assessments in its areas of interest, or to draw upon assessment results obtained by others; and to utilize those results to affect the decision processes regulating society's use of the technology or technology-based system under consideration.

To accomplish that purpose, each CAA would have inhouse, or available to draw upon, a capability for arriving at assessment judgments. Thus the CAA could have its own staff and/or advisory council of assessment authorities who would form the assessment judgment upon which the CAA would act. Or the CAA could draw upon available results of assessments by groups such as the National Academies of Science and Engineering; or contract with universities or research institutes, to carry out specific assessment assignments. When further research was required before an assessment judgment could be formed, the CAA could similarly carry out such research inhouse, or contract with others for its performance.

Regardless of which of these patterns was followed, the CAA would arrive at an assessment judgment upon which it wished to act. (Since the essence of the CAA concept is citizen participation, there should be provision in the agency rules regulating CAA's that such assessment decisions must be duly ratified by the CAA's membership before they can be accepted and acted upon. This would help preclude the CAA's from being subverted into elitist, expert-dominated organizations.)

Upon acceptance of an assessment, the CAA could follow one or more of a number of possible courses of action.

(1) The CAA could disseminate its results publicly and attempt to influence overall public opinion, or the views of selected segments of the public.

(2) The CAA could lobby directly (or indirectly through other lobby organizations) with Congress, state legislators, government agencies at, Federal, state, and local level, the White House, governors, influential private organizations and individuals, etc. The purpose of such lobbying would, of course, be to induce the target group to accept the assessment results and take appropriate action on them.

(3) The CAA could institute class action, legal proceedings on behalf of its membership and other potentially affected parties. These legal proceedings could be directed at any organization or individual in society (including agencies of Federal, state, and local government when appropriate), which were making use -- or planning to make use -- of technologies whose assessments indicated detrimental consequences to the persons or interests of certain segments of the public.

This power to initiate litigation includes several important components:

(a) The suits would be class action suits that would apply to whole classes of affected parties.

(b) The detrimental consequences could be either to the 'persons' or the 'interests' of certain segments of the public. Thus if it could be shown in court that it was to the interest of a certain segment of the public to maintain the beauty of a national park intact and uncontaminated, then action which would injure that park would be detrimental to the interests of the affected segment of the public.

(c) The technologies with the detrimental consequences need not be functioning already for the litigation to commence. The planned use of technologies with detrimental consequences would also be subject to appropriate litigation.

What kinds of results would ensue from such litigation? In the case of technologies which were already in operation, with attendant detrimental consequences, the courts could award damages to the CAA and associated affected parties. (In addition, appropriate criminal action could be initiated when criminal violations had occurred.)

In determining damage awards, the CAA Act establishing the agency and the associations would extend the concept of damages and associated costs to include not only real and punitive damages when applicable, and the litigation costs borne by the CAA, but also that portion of the CAA's operating costs which enabled it to prosecute the suit successfully. Thus the CAA would be entitled to be reimbursed for: (a) its own operating costs relative to the preparation for and prosecution of the suit; (b) the costs of relevant research contracts and consulting fees; and (c) an appropriately prorated portion of the interest on the CAA's Citizens Assessment Bonds. This statutory extension in the concept of damages and associated costs would go a long way toward assuring the financial viability of CAA's.

In the case of technologies whose detrimental consequences had not yet occurred, the following kinds of results would be possible. This would include technologies which were planned but not yet in being, as well as technologies in existence, whose detrimental consequences had not yet occurred, but could be scientifically forecast with some degree of confidence.

In such cases, the CAA could seek a permanent injunction to prohibit further implementation of the particular technology, as well as appropriate dismantling of what was already in being. If such an injunction were awarded (and sustained of course), the organization on whom the injunction were placed would be liable to reimburse the CAA for its litigation costs, and also for the associated costs necessary to prepare the case (as outlined above). Again this would greatly aid the CAA's in maintaining financial viability.

#### E -- Financing of CAA's

As noted above, CAA's would be permitted to accept charitable donations, membership dues, and grants and contracts from private and government organizations. But the primary source of their funds, and the foundation of their financial stability would be the Citizens Assessment Bonds they would be empowered to issue.

The interest rate on these bonds would be regulated by the CAA agency. The rate would be set at a higher level than that permitted on savings bank accounts, and probably somewhat higher than that permitted on bank certificates of deposit or savings and loan association rates.

Bonds would be issued for ten year periods, and interest on them would be guaranteed by the CAA agency in case of default on the part of a particular CAA.

Other sources of funds available to CAA's, besides the bonds, donations, dues, grants, and contracts, would be reimbursement for operating costs (as broadly defined above) arising from successful litigation. CAA's would redeem outstanding bonds at the end of ten year periods through these sources of funds, as well as through additional bond issues.



With these ground rules, some CAA's would undoubtedly become financially insolvent. In such cases, the remaining assets of the CAA would be distributed to the bond holders on a pro rata basis. Thus there would be some element of risk in these bonds; and it is for this reason that their interest rate would be set somewhat higher than bank savings certificates, for example.

The interest rates would not be set too high, however, because the purpose of these bonds is not to provide a desirable form of investment in general. Its purpose is instead to enable citizens who care about particular assessment issues, like water pollution or noise due to the SST, to contribute to society's resolution of the issue, at minimal risk to their normal savings.

To those who would doubt the appeal of such bonds, I would merely point out how voluntary citizens organizations have managed to survive financially without this reimbursement mechanism. With it, I think they will flourish, and citizen participation will rightly become a powerful factor in the assessment process.

#### F -- Balanced Approach of CAA's

Although much of the preceding discussion on the CAA has been couched in terms of the negative consequences of technology, there is nothing inherent in the CAA concept to exclude the promotion by CAA's of particular technologies with expected positive consequences. For example, a CAA could be formed to promote the development and use of electric cars, or certain systems of public transportation, or solar energy systems, etc. The purpose of the CAA concept is not to facilitate citizens' attacks on technology, but rather to enable citizens to achieve full democratic participation in the

process of technology assessment. Without such participation, the whole character and quality of our democracy would ultimately be vitiated.

#### V - IMPLICATIONS OF CITIZEN ASSESSMENT ACTION

The Citizens Assessment Association concept as presented represents an institutional innovation which could prove significant. Accordingly, it is worth exploring some of its major implications.

If the CAA concept were implemented, there would probably be extensive use of class action suits. At the same time the proposed legislation would foster an extremely broad interpretation of the 'interests' of certain segments of the public. Recent lawsuits filed in the environmental area have been filed partially on behalf of future generations. While this is perhaps an extreme case of a broad interpretation of 'interests', it is nonetheless the general direction toward which the CAA concept would move litigation.

The broad interpretation of associated costs of litigation -- to include the operating and research costs of the CAA necessary to establish the assessment case -- appears to be of some legal significance. Whatever its significance, however, I believe this interpretation is absolutely essential to enable the judicial system to play the crucial role with respect to society's utilization of technology that it has played in other areas of society's evolution. For the complexities of technology are so great and the future consequences of present technological activity are so difficult to determine, that relevant research must be seen as an essential aspect of litigation on these matters.

Finally, there are the implications of using present scientific research as evidence to assert that it is reasonable to conclude that certain consequences are probable to occur in the future. For example, scientific research could well conclude that the use of a certain chemical in small doses over a period of time would cumulatively constitute a future hazard to a statistically significant segment of the population. On such grounds under the CAA proposal, an injunction could be obtained against the promoter of the chemical, with his incurring a financial liability to the CAA which successfully sought the injunction. This seems to me again to pose some legal issues of apparent significance. But I am convinced that the legal system must find a way of taking account of such considerations, if the system is to fulfill its role in a technology-centered, highly interdependent society. Put in other terms, I believe the legal system must find a way of making present determinations of fact on the basis of scientific evidence regarding probabilities of future occurrence.

As challenging as some of these problems may be to the legal community, the industrial world will also have its share of adjustments to make. The concept of imposing costs on an industrial firm on the basis of some of its planned activities, or on the future consequences of present activities which are scientifically forecast to prove detrimental, is certainly something of a radical notion. But again, I am personally convinced something of that sort is essential for society in order to control the evolution of technology-based industry in socially desirable directions -- or at least in directions which are not socially detrimental. One point is clear in this regard; if such costs were imposed on industry, firms would

certainly think much more deeply and carefully with regard to the social consequences of their actions. The 'total systems, future-oriented approach' to technology assessment would undoubtedly gain many adherents in industry!

A final implication of the CAA concept which may be cited derives from the Citizens Assessment Bonds. These bonds are predicated on the assumption that it is proper for citizens to receive a financial return (even if a modest, limited one) on relatively low-risk investments they may make, with the objective of enhancing the overall assets of society, such as environmental quality. It is interesting to ponder where such a radical notion may eventually lead.

#### VI - CONCLUSION

In this paper I have made a plea for the importance of citizen participation in the assessment process, and presented a proposal for an institutional innovation which would facilitate effective citizen assessment action. As I stated initially, the proposal is a preliminary one intended to generate discussion on the myriad of issues involved. It contains a number of radical concepts and mechanisms which are undoubtedly open to a number of criticisms. Nevertheless, I believe the proposal contains the germ of an idea which is worth pursuing. If recent decades have taught us any lesson, it is that the radical concepts of one year rapidly become the cliches of the next one. On one final point, I am absolutely convinced: we have to find a way of assuring effective citizen action in the assessment process if our society is to survive as a democracy -- in which the quality of individual life remains paramount.

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