

INFORMATIONAL SOCIETY

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PAPER NUMBER FIVE

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Minneapolis, Minnesota

June, 1972

NOTE

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1. INTRODUCTION

In attempting to solve the social problems created by the increasing rate of technological change, planners have devoted most of their attention to technological solutions. However, if the proposed solutions require actions which conflict with the ideological basis of society, a more promising alternative might be to design an alternative institutional structure, or utopia, intrinsically more adept at coping with the current social problems. The purpose of a utopian design is not to suggest practical short range institutional reform, but rather long range goals towards which the process of institutional evolution might be directed. This paper presents one such institutional arrangement, informational society, designed to cope with consequences of a continuous high rate of technological change.

For the foreseeable future the current high rate of technological change is likely to continue unabated. First, economic competition is increasingly becoming the process of new technology replacing older technology. As less developed countries master the current technology of the advanced nations, the advanced nations must constantly innovate new technology to maintain their share of world markets. Second, the international power struggle will continue to give impetus to sizeable funding for weapons technology. Third, new technology is being demanded to solve the social problems of urban life. To create new technological possibilities, a continuing high level of expenditures on science can be anticipated.

One major social problem which a continuously high rate of technological change will create is unemployment. Given advances in automation and increased international competition, the production of material goods will gradually become automated. One might assume that the displaced workers will be absorbed into the service industries; however, a more likely prospect is that the service industries also gradually will become highly automated. For example, education gradually will make increasing use of technology first to supplement and then to replace classroom lecturing. Hospitals gradually will automate medical records, testing procedures and gradually provide software diagnostic routines to supplement professional judgement. The design of informational society

is therefore based on the assumption that in the future traditional work will be available only to a minority of the population. Hence, the planner must propose not only an alternative to work, but also a new income distribution system so that the population can buy the automatically produced goods and services.

A second problem with which future society must cope more adequately is the problem of pollution, [3]. While environmentalists debate just how quickly man is destroying the life support system of the biosphere, there is general agreement that the degradation of the biosphere is rapid. Pollution is caused both by the indiscriminate introduction of chemicals and other materials into the environment and the rapid increase in the per capita use of energy both in the production and the consumption of goods. The problem for the planner is how to resolve the inherent conflict between pollution and the production and consumption of goods and services.

These examples illustrate the limitations of the current science and technology policy. First, the social implications of the new technology are rarely considered in decisions concerning the development of a new technology. Given a high rate of technological change, social institutions also must constantly change¹ both to increase their performance and to grapple with the new social problems created by technology. Unfortunately, current institutional arrangements do not appear to have the necessary adaptive capacity. Second, the incentives for introducing the new technology do not adequately reflect the social costs of such technology.

The advantage of designing an entire utopian society² in the future to rectify the problems of automation, pollution, and the lack of adaptation of institutions is the fact that if the design is deemed desirable, policies can be instituted to guide the present society towards the

¹For a discussion of individual and social adaptation under conditions of continuously high rates of technological change see [9].

²In the conceptual framework of Boguclaw, [1], the proposed utopian design combines some of the characteristics of an operating characteristics utopia with a heuristic utopia.

desired state. This greatly contrasts with present planning methods where by the time on-the-shelf technology has been applied to a current crisis both the nature of the problem and the technological possibilities have changed. Problem solving in the future involves providing incentives for the evolution of a particular type of technology and social organization such that the problems are evolved out of existence. The job of the social planner is to convince the general public that a particular social design deserves serious consideration.

The technological requirement for the proposed design is the creation of a social nervous system. One component would be a world wide linkage of all computer systems, data banks, and terminals such that any computer or data bank is accessible from any terminal. Integrated with this system would be telephone, video telephone, TV, and CATV systems. Finally, all information such as books, magazines, and newspapers would be processed in electromagnetic media which facilitates electromagnetic transfer through the social nervous system. To utilize the social nervous system effectively, a wide variety of terminals are required. At home the family, commune, or other social unit might have a wall screen, which can be segmented so that the individual could engage in a group discussion with each participant in one segment and project information on the remaining segments. For entertainment the individual would have access to all live or previously taped entertainment, which he could view on the total screen. Around the home there also would be smaller special purpose devices hooked into the social nervous system. Seated at any terminal each individual would have access to all information, the computing capacity, and all other individuals.

Under the present incentive system for technological advances the social nervous system is presently evolving [8]. Computer systems coupled by telephone and other means of communication are now international in scope. Technologically, while it is possible to transmit printed matter via communications devices, society still relies predominantly on an information technology based on paper. As the

pollution problem involved in creating and reprocessing paper raises the private cost of paper products to their social costs, the substitution of an information technology based predominantly on electromagnetic devices and for the most part dispensing with paper altogether will seem increasingly attractive [7]. As society becomes increasingly concerned about the per capita consumption of energy, social structures which use less energy will become increasingly attractive. The implementation of an integrated social nervous system would facilitate the more efficient use of energy in that the transportation of information objects will in many cases substitute for the transportation of material objects.

If with automation all physical goods are produced without direct human labor, then the only human activities which will resemble work are processing information through the social nervous system. Such activities are research and development, and management through the management information system. In view of the fact that information processing is likely to become the principal concern of society, let us label our future utopian society informational society to distinguish it from the industrial society which it will replace. The most important distinction to make between organizations in informational society as opposed to organizations in industrial society is the fact that the former will have no physical location. The location of every organization is simply a key word in the social nervous system, and thus every organization is accessible from every terminal. Hence, a person can participate in most activities of organizational life from the terminal of his choice.

As society gradually becomes automated, the labor/capital ratio in production will asymptotically approach zero. One method of providing income to the population is to abolish private inheritance in favor of social inheritance such that when an individual reaches maturity he receives his share of the wealth of the country. Such a system implies that the individual starts his career financially equal to his contemporaries. Hence, there is no need to redistribute income through taxation. Also, with equal financial opportunity most public services can be funded

on a service fee basis. While the social inheritance will provide for the individual's physical needs, activities are required to provide the individual with emotional satisfactions. One possibility is to revitalize community life to provide the individual with a great diversity of activities in which he can participate.

2. COMMUNITY

To make the community life of informational society flourish, impediments to community life which currently exist in industrial society must be removed. Gradually, as industrial society has evolved, decisions concerning community life have continuously shifted to higher forms of government. Also, as the scale of operations to optimally provide services such as electricity, sanitation, water, etc., has grown, the control of these services has shifted to the metropolitan region and is almost completely out of the control of the community. The professional educator, by insisting that only through enormous plants can the diversity of educational services be provided, has, for the most part, wrested control of the educational process from the community. Not only has the community lost control over its internal affairs but also over its physical identity. With metropolitan sprawl, political subdivisions within the metropolitan area are losing their identity. The network of roads and superhighways submerges the community into the larger area. Likewise, with the current network of radio and TV stations, community identity is totally submerged within the larger metropolitan area. For the most part, the individual or nuclear family relates directly to the institutions of mass society.

To make communities function again will require major design changes from the current industrial society. Each community needs a distinct physical boundary separating the community from its neighboring communities. For this purpose a green belt would be owned by the metropolitan government. Since the need to go to work daily will not be common in informational society the transportation system also can be designed to

enhance the community's identity. Each community should have only a limited number of exits and entrances. Major metropolitan transportation systems should either be built underground or on the metropolitan government's land. This would imply that in informational society communities would never be traversed by crowds whose only purpose for being in a community was to traverse it. To avoid the evils of absentee ownership only people who lived in a community could own land in the community.

The community life of informational society will differ considerably from community life of previous societies in that each individual could simultaneously exist in two cultures from his village. The first culture is the informal culture of the village in which the individual would physically participate, as for example in social events, crafts, and sports. As prestige is likely to be increasingly measured in terms of skill, informal communities are likely to evolve into tribalized groups organized around a small number of activities at which the community members excel. The second culture is the formal culture of the social nervous system in which the individual participates mentally by images, as in group meetings via the segmented wall screen. To facilitate communication between diverse community cultures a formal language and customers³ will be desirable to participate in the social nervous system.

One type of informal community might be the revival of handicraft communities. Craftsmanship provides the artisan with inner satisfactions and at the same time provides artifacts to contrast with machine-made goods. Artisan communities would be neomedieval in character in that guilds or professional craftsman societies would revive to offer fairs with prizes for outstanding craftsmanship. Sports communities also would evolve whose members would excel in a particular sport. As theoretical science and mathematics do not require special equipment, another type of community would be the research community. A new type of community

³In the language of Goffman, [5], village life would be characterized as backroom behavior; whereas social nervous system life would be characterized as frontroom.

would be the community of social critics or Naderites whose positive social function would be to analyze the functioning of organizations in the social nervous system. Also likely to exist in informational society are religious communities, whose members obtain meaning for their lives through the practice of a particular set of religious beliefs. Communities for which the principal activity of the community requires the members to pool considerable portions of their guaranteed income are likely to be quite specialized. In contrast, communities of generalists will pride themselves in the diversity of their activities.

As will be discussed later the political system of informational society will delegate all decisions concerning social custom or life styles to the community. This will permit communities to evolve into distinct informal cultural types. While traditional religious communities will eschew divorce, abortion, and other behavior prohibited by religious belief, at the other end of the social spectrum communities will experiment with commune-style living with neither marriage nor the conventional family unit. By delegating decisions concerning social customs and practices to the community, each community can evolve an integrated set of social customs and practices which are mutually congenial to the members of the community. While the informal culture of the community would have some superficial resemblance to a tribal village in primitive society, the social nervous system gives the community a dimension not found in any previous society.

The social nervous system enhances community life by providing numerous informational services to the members of the community. For example, the educational professional would create the technology of education which would reside in the social nervous system. The teacher of primary and secondary education would act primarily as a counselor helping the student as an individual to select the educational methodology best suited for his capabilities and interests. This type of educational system enables the community to integrate any ethical, moral, or religious teaching with technological education.

Another activity which the social nervous system facilitates is shopping. Besides the obvious advantage of replacing money with credit, the social nervous system will ensure that each individual will be able to buy mass-produced goods and services with a minimum markup. Using his wall screen the potential buyer will be able to assess the merits of potential purchases by projecting them into their intended setting. Then with a "consumer union" service the buyer will be able to obtain an unbiased estimate of the quality of the good or service. Finally, using a price search algorithm the buyer will be able to locate the seller offering the best price without having to leave his home.

Besides enriching community life, the social nervous system enables the individual through his wall screen to participate in organized activities involving individuals physically remote from one another. Social activities such as club meetings, games such as bridge, and discussion groups are a few examples. As will be discussed in the next two sections, economic and political affairs also will be conducted through the terminals of the social nervous system.

Community life in the informational society should provide its members with a more meaningful life style than the community life of any previous society. The structure of community life enables the individual to mesh any informal life style with his formal activities in the organizations of informational society. Community life is likely to be more personal than its counterpart in industrial society. Yet with the great diversity of activities available through the social nervous system, community life is unlikely to have rigid social structure of the primitive tribal village. As participation in organizational life can be affected from any terminal, women will be much more successful at integrating child rearing with nondomestic activities.

The community structure enables the individual to engage in a vast array of activities for which no travel is required. Individuals would, in varying degrees, travel to and from their villages. Visiting acquaint-

tances who live in communities with markedly different cultures would be a stimulating experiment. World travel is likely to continue to increase as the world society becomes wealthier.

3. ECONOMIC AND PUBLIC GOODS ORGANIZATIONS

As the industrial revolution has progressed, the size of the average industrial organization has continued to grow. From a purely neoclassical economic perspective the optimal scale of operations has become larger with each new technological advance. Monopoly power over pricing is another powerful incentive for the growth of a single giant corporation dominating a single industry. Another economic consideration of recent origin is the spiraling research and development cost of introducing a new product on the market. Given the high risk involved, a firm must be of sufficient size to absorb the possibility of a new product failing to achieve market success. Politically, large firms are much more successful at achieving special purpose legislation than small firms. Likewise, public goods industries such as education have grown to an increasingly large scale of operations.

The enormous size of current economic and public service organizations has numerous disadvantages for society. With monopoly power the public receives less of the product at a higher cost than would have been the case under pure competition. The political power of the firm inhibits social legislation, such as pollution control, which may have high social benefit but which threatens the economic survival of the affected firms. Moreover, given the fact that the locus of activity in organizations is shifting from operational to research and development activities, the traditional hierarchical authoritarian organizations of industrial society do not offer psychological job satisfactions for the professional in research and development activities. Placing great virtue on standardization of bureaucratic procedure such that the individual is submerged in the organization enhances the power satisfactions of the bureaucratic manager but at the same time frustrates the drive of the professional to self-

fulfillment through professional competence and control over the incidentals of his life.

As society progresses from the industrial to the informational age most routine activities will be performed by mechanical devices. The most obvious to become mechanized will be the assembly line. Other less obvious activities include the routine processing of information. For example, as credit replaces money as the medium of exchange all financial transactions will be carried out by software. All of the innumerable paper processing activities of bureaucracies which currently require a multitude of clerks and secretaries will be automatically processed by computer software routines. The question arises, "What activities will be performed by people?" In production the principal activity will be the research and development of new products and services. For managers, the locus of activity will shift from operational considerations to the analysis of constant technological change. A question which will bother managers is, "At what point should an old technology be replaced by a new one?" Managers will be faced with a succession of unique situations, each of which will require staff work from sizeable groups of professionals whose task is to assess the effects of the alternatives on the total environment-- physical, biological, and social.

As the organizational tasks of informational society primarily will be nonroutine activities, there is little point in bringing people together to process information in quasi-factory physical plants. For numerous reasons it is advantageous to send information through the social nervous system to the members of the organization rather than bring the members to a specific site to process information. First, the amount of energy, and consequently the amount of pollution, is less. Second, an individual will be able to change his organizational affiliation with a minimum of disruption of his social life, since changing organizations does not require any physical relocation. Finally, having all organizations accessible from any terminal implies the prospect of bringing the advantages of the resource allocation of pure competition to the structure

of large organizations.⁴ As organizational work in informational society will be quite scarce, having a job will bring prestige both to the individual and to his community. Having every organization merely an artificial entity in the social nervous system means (as an asymptotic limit) that the competition for every opening is worldwide.

In informational society the corporation as a legal entity will be replaced by a net of contract groups, each of which becomes a legal entity bound together by formal contracts of finite duration. The contract will specify the services to be performed, the criterion for judging the services, the authority of the organization over the contract group's actions, and the duration of the contract. Examples of contract groups would be management, staff analyst, and research and development groups. At the end of each contract period a new contract would be prepared and bids solicited from any potential contract group on a world wide basis. While contract groups of one person are possible, they would be infrequent. As problems in informational society are likely to be even more complex than in industrial society, the team of a small number of individuals with diverse skills would become increasingly effective. In contrast to the formality of relating to people external to the group, inner group organization would be decided on an informal basis by the members of the contract group. Where the need for intragroup communications is very heavy, the contract groups from the same community would have a competitive advantage.

Switching to contract management with open bidding has numerous advantages for informational society. Given the prestige of organizational work and the excess of supply of qualified candidates, society would obtain the services of the best talent at a minimum cost. In fact, if a contract were appealing enough, potential contract groups might even be willing to forego part of their guaranteed income to obtain the contract. Having contracts written for a finite time period, say two years,

⁴For a particularly elegant treatment of general equilibrium, pure competition and Pareto optimality see [2].

provides a mechanism whereby institutions can rapidly adapt to changing social needs. During a contract period given a continuous high rate of scientific and technological advance, society's perception of both the objectives and techniques⁵ which will maximize the common good is likely to change. Having to rewrite all contracts at specified time intervals focuses attention on revising the specification of objectives to maximize the common good. Competitive bidding by potential contract groups will increase the probability that the technique best suited for those objectives will be employed. As everyone receives his guaranteed income regardless of whether he has a contract or not, no special provisions need to be made for contract groups when their contract expires. Thus, organizational size can readily expand or contract to changing social demands for its services.

The most difficult aspect of contract work groups as the basic legal work group of society is how to specify the contracts. As there is no a priori method of determining the best methods, social experiments would have to be conducted to test alternative hypotheses. For example, one issue to be resolved by social experiments is whether better results are achieved by having contracts specified hierarchically downward from a board of directors or by having contracts specified by a group completely independent of the hierarchy. Another issue is whether contract periods should overlap to provide continuity within the organization, or whether they should terminate simultaneously in order to provide maximum adaptability of the organization. To make the specification of future contracts independent of the personal considerations of the present contract groups, it may be advisable to require a non-work period of finite duration between contracts.

To improve the performance of the recontracting mechanism a policy that the data files of all institutions be open for public inspection at

⁵Technique in the sense of Ellul, [4], is defined as a broader term than technology which usually refers only to material entities or hardware. In the language of informational society technique means hardware plus the associated informational software.

any time is advisable. Economic institutions in informational society will operate in an artificial market environment since the contract groups will operate in a quasi market with prices reflecting both private and social costs⁶ and since the rules of the game will be set in the political system. Given the complexities of such a system and the lack of precise a priori theories to specify the optimal design, constant monitoring of institutional performance is a vital necessity if the recontracting mechanism is to lead to gradual improvement in the social performance of institutions. Society will need the services of Naderites who will be constantly analyzing organizations to see if they operate in the public interest. With contract management, the Naderites will, in most cases, direct their energies towards changing the specification of the next round of contracts.

For the participants of organizational life the contract group structure should be superior to previous organizational structures. As the contract specifically limits the power of the organization over the group to job related activities, the individuals should be able to mesh any life style with their work. Furthermore, as work as non-routine individuals will have much more flexibility in organizing their daily routines.

4. GOVERNMENT

Both needs of informational society and the technological possibilities dictate that the optimal design of a government for informational society will bear little resemblance to types of government prevalent in industrial society. One of the major problems with government in industrial society is that with the advance of technology decision-making has shifted to higher levels of government. The quality of decision-making suffers as each level of government is inundated with problems which could be much better resolved at lower levels of government. For example, being burdened with operational considerations, officials at the national level devote insufficient resources to long-range planning to solve problems

⁶Algorithm for specifying artificial prices is specified in the contract.

created by technology. Industrial states where wealth⁷ implies a disproportionate political influence face an even more basic problem. The important problems of informational society, i.e. income distribution, pollution, and science and technology policy are problems which an economic elite are both reluctant and incompetent to solve. To make government in informational society function effectively, the powers of government must be redistributed to focus the resources of each level of government on the problems most appropriate for that level. In its relationship to the economic subsystem government should strive to create an artificial environment wherein private and social costs are approximately equal so that the market can operate free of direct regulation. Also the qualifications for elite status will require revision such that disproportionate political influence rests with the group of people most competent to solve the problems of informational society. Finally, direct democracy will become an effective device for offering the populace the opportunity for greater participation in government.

To make government function effectively in informational society a clear separation of powers between the various levels of government is necessary. The first principle to make the community function properly is that all decisions concerning beliefs and life styles should be delegated to the community. For example, the question of abortion, long hair, nudity, and sex mores, should all be resolved at the community level. The benefits of delegating life style issues to the community are that first, it enables the communities to evolve into culturally integrated entities and second, if higher governments are not constantly caught up in emotional issues then the quality of decisions which require analysis and not rhetoric should improve.

Allowing the community the right to regulate life styles within the community involves a trade-off between individualism and community life. The cultural integrity of the community is enhanced if the community can

⁷A similar problem exists in communist countries where elite status is awarded to party hacks.

prohibit within the community behavior objectionable to the members of the community. The individual given a wide diversity of communities can find a particular community which will permit or even support his desired behavior. The political stability of the community structure requires that in return for being able to practice their own beliefs people will tolerate the practice of radically different beliefs in other communities. In a social contract sense there are practical reasons for accepting such a compromise. A diverse community structure provides a natural mechanism for change with the minimum of social disruption. By a process similar to biological mutations the most experimental communities constantly will evolve new social forms. As is true in biological mutations most of the social mutations will be abandoned as failures. Only the most successful gradually will diffuse from the most experimental to the most conservative communities.

The primary concern of the second level of government which coordinates the activities of the communities is to provide the communities with all of their operational needs. The second level government would provide sanitation, gas, intercommunity police and other services currently offered by metropolitan governments. The pollution standards of goods produced in the private sector would be regulated by the second level government in the sense that the second level government could impose more stringent but not less stringent standards than the higher levels of government. Intercommunity transportation systems, automatic factories, and other entities providing goods and services to the communities would be located on land regulated solely by the second level government and not by the communities. However, the second level government also would assume control over all social programs currently operated by the federal government.

In providing services to the communities each service should be organized as a public goods corporation which would be maintained on a service fee basis. The board of directors either could be elected or be appointed by the second level government and the contract bidding system

would replace civil service. One of the difficulties in charging on a service fee basis for services such as roads is the inconvenience of charging the customer. Technological advances are required such that the individual can be debited directly to his account in the social nervous system. The ingenuity of the professional economist will be challenged to devise price algorithms which reflect social instead of private costs. Public service would be organized on the basis discussed in section three. Competitive bidding for contract groups is one factor which will ensure efficient resource allocation. Another is the fact that all of the records of the public utility will be open for public inspection in the social nervous system. As most of the services provided by the second level government will be supported by service fees, the taxes required to operate the second level government should be small.

The most difficult problem for the second level government is resolving social conflicts between communities. If each metropolitan region evolves a diverse structure of communities, then the second level government would be fortunate if compatible communities adjoined one another while incompatible communities were widely separated from one another. Conflict will arise when the activities of one community infringe on the activities of another. To lessen the possibility of violent conflicts, social programs designed to promote tolerance will be an important component of higher levels of government. Even if conflict resolution becomes violent in informational society, the violence is likely to be localized especially if the primary loyalties of people shift back to their communities.

The function of the third level of government would be to formulate the science and technology policy. The central problem in informational society is trying to develop an improved institutional structure for assessing the relative social merits of alternative techniques. Given the lack of a priori theories⁸ for assessing the implications of new technology, a technological release policy will have to be instituted. Besides a

⁸ Assuming Hume's argument, [6], on the relationship between theory and observations is conceptually correct, there will never be an a priori method by which the human society can judge with certainty the full implications of any specified technology.

more extensive laboratory testing procedure for new technology than was prevalent in industrial society, the initial operational release of new technology in informational society will be restricted to a few regions for more extensive observation to prevent disasters such as DDT. Generally, new operational technology would be introduced in areas with a high propensity to experiment and, if successful, would gradually diffuse outward to less experimental regions.

Like second level government, a considerable portion of the research and development activities can be financed from service fee charges. In a society where people are searching for meaningful activities, basic research is likely to be a rewarding activity of the intellectually gifted. Hence, if the social dividend is large enough, professional societies through dues will be able to fund sizeable amounts of basic research without additional government support.

Applied research and development to create new techniques should be organized in the form of a public service corporation (see section three) which is funded on a service fee basis through leasing new techniques. The third level government would appoint the board of directors, and the contract bidding system would replace civil service. To prevent conflict of interest, the testing of new technology for public safety and pollution impact would be conducted in separate public service corporations. As Naderites would be unlikely to trust the government's evaluation of new techniques, Naderites, by pooling portions of their social dividend would conduct their independent evaluation of technology. This phenomenon would be in the public service, since with dual independent systems the probability of failure to detect a potential hazard should be much less.

The present political system, all too frequently, addresses social problems only after they have reached crisis proportion. The improvised solutions are both inefficient and expensive. In order to achieve more effective government in informational society, third level government will have to shift its energies towards developing programs for projected

crisis. First, in the absence of precise a priori theories, the development of effective social programs will require social experimentation with the alternatives. But, as the time required to conduct many social experiments is dependent on the biological life cycle, the time required to conduct experiments will not decrease with technological advance.⁹ With a continual high rate of technological advance the problem of anticipating future problems becomes critical. Hence, long range planning will become a high priority item with the third level government, and operational considerations will have to be delegated to lower level governments.

With the expansion of the franchise, representative governments of industrial societies are now constituted on the principle "one person, one vote." While such governments explicitly may be constituted on equal political influence, the actual political distribution of power is concentrated in an economic elite. Implicit disproportional political influence works for society's benefit under the condition that elite status implies superior ability to solve the problems which beset society. In the evolution of western industrial society, the assertion of private wealth accumulation as a national objective was consistent with economic wealth being the criterion for elite status. However, as society progressively moves from an industrial to an informational base, the economic wealth criterion increasingly becomes a liability for the effective functioning of government. An effective method of income distribution in an automated society is not likely to be developed by a group whose rationale for being elite would be threatened. The problems of science and technology (e.g. pollution) in many instances require solutions inimical to private profit motives. If informational society is to function effectively then the criterion for elite political status gradually must shift from economic wealth to professional competence, so that the science and technology policy will be formulated by the group most competent for the task.

To create a more responsive government the representative government of industrial society will be replaced with direct democracy. With the

⁹The precision with which the experiments can be evaluated should increase with technological advance.

social nervous system it is possible to design a government whereby each individual has the option of voting on every issue. While the design gives the citizen the right of unlimited participation in government, it would be anticipated that citizens' participation in government would vary directly with the power of the government to regulate their daily lives (i.e. decreasing participation at higher levels of government). To write laws and to conduct investigations there would be a need for representatives. To represent the individual's voting interests proxy voting would be established in such a manner that the voter could override his proxy on any issue. With a strong form of community organization most voters would not release their proxies outside their community. Whereas under the representative government of industrial society most voters exercise their option on national elections, in informational society most would also personally vote on the budgets of the various levels of government.

Direct democracy has the advantage that both the government and also the elite are held accountable to the people. With direct voting the interaction between the government and the governed is continuous. The government's concern for the wishes of the people is likely to be quite genuine, especially since the power of the budget is vested in the governed. Furthermore, a direct democracy is better insulated from economic influence, since the number of voters who must be influenced becomes prohibitively large and the policy of open files in the social nervous system would make such actions transparent. In Western industrial society the notion that the pursuit of private personal gain promotes the public good made the notion of public accountability of the elite unnecessary. In contrast, the professional elite will be held explicitly accountable to the general public through the budgets of the higher levels of government which cater to the interests of the professional elite. The weakness of direct democracy is that it is much more susceptible to actions based upon momentary passions. One of the reasons for delegating all issues regarding social customs to the community level is that the issues of higher governments are likely to be increasingly abstract and therefore of little interest to the general public. Furthermore, if communities

become distinct, the probability of mass movements based solely on emotional arguments is lessened. Hence, by demonstrating that they act in the public interest, the professional elite will have a reasonably free hand to formulate the science and technology policy, informational society's most vexing problem.

In dividing powers between the levels of government, consideration should be given to the issue of whether checks can be constructed to the inherent abuse of power. If third level government is responsible for developing new technology, on a service fee basis, then checks are required to curb the tendency of the developers to impose new technology on the public. For example, if the educational technology group develops a new training device and installs it in the social nervous system, its desirability should be determined by use and not by the fiat of professional educators on contract with the third level government. Likewise, second level governments need the power to impose higher standards on such technology as nuclear power in cases where the local experts believe that higher safety standards are required. Further, as third level government is involved in scientific projects and not in the operation of programs, there is no need for third level government to have any more information on individuals than sample surveys. The sample surveys at a much lower cost can provide the information needed to understand behavior and at the same time inhibit the efforts of third level government from having excessive power over individual lives. As the affairs of government will be conducted openly (i.e. any individual can tune in via his wall screen), the prospect of a government secretly manipulating the populace is lessened.

To protect the individual from abuse of power the potential abuse of power of information must be curbed. In information society open files are desirable so that the public can judge institutional performance. To protect individuals it will be far easier to specify legally how information can be used than to prevent the collection of information. In competing for contracts the criterion for judgment must be prespecified.

Information requirements not pertinent to the job can be challenged in court. After the software algorithm has selected the winner, all contestants can examine all files. The individual is protected in his community from undesired influences by the right of exclusion. While the community can deny access to outside groups, the community does not have the right to deny a community member access to any information in the social nervous system. Finally, in making decisions concerning individuals, the only information which can be employed is the information in the individual's legal file, one copy of which he maintains and one copy of which is maintained by the operational government. The individual has the right of court action to prevent inuendo from entering his legal file. The copy in the operational government file prevents the individual from deceiving society.

5. INDIVIDUAL

For the individual in the information society the quest is to find meaning for his life. The structure of informational society facilitates the process by offering the individual the widest possible assortment of activities and community cultures in which he can participate. The social striving which is likely to predominate is the striving for prestige through demonstrated competence. Thus, striving for prestige will characterize not only the economic and government organizations but also the crafts and various sports. In a Veblenesque [10] fashion people engaged in nonprestige activities will mock the actions of people engaged in genuinely prestigious activities. For the individual content with his community culture and activities, life would be an emotionally rich experience. However, the gifted individual destined for an important role in the institutional life of informational society might be at odds with his childhood community culture in that he might have to travel great psychological distances to reach his goal.

At birth the child would be conditioned by the culture of his parents' community culture. Since his early conditioning is beyond the individual's

control, the individual would grow to adolescence implicitly accepting the culture of his community. As participation in the organizational life would be very prestigious and would require that the individual have some acquaintance with cultures in addition to his own, the youth would have strong incentives to continue their education away from their parents' communities. Consequently, many youth would travel around the world in a teenage subculture. As education would be available at any terminal of the social nervous system the education would have the quality of a 19th century grand tour.

In mingling with the youth of other cultures the individual would be challenging the beliefs of his parents' community. As a young adult he might live experimentally in several different cultural communities before settling down to his chosen life style (which not so surprisingly is likely to be very similar to that of his parents'-perhaps even in his childhood community). During his life, an individual, in order to experience the diversity of life, might take extended visits to communities with cultures other than his own. To cope with future shock, the individual could control the portion of his life engaged in stable community life and the portion engaged in the ever-changing social nervous system.

For the gifted individual who finds a community culture suitable to his tastes, there would be participation in most of the world organizational life without the necessity of leaving his community (a la Emanuel Kant). The possibility of choosing his community of residence on the basis of its culture encourages the individual to find a community which provides positive psychological supports for those activities to which the individual wishes to devote his critical skills.

6. THE PROBLEM OF TRANSFORMATION

The sketch of informational society presented in the preceding sections is only one type of social structure possible in the future. Given the rapid rate of technological change, it is likely that desirable

social structure of the future will have little resemblance to the declining industrial society. There is no guarantee that society will naturally evolve into a superior social structure. Given no incentive for the desired changes, it is just as likely that society will naturally evolve into a repressive dictatorship. In order to achieve informational society as a stated objective in the future, what changes must take place?

The first change in policy which the federal government must make is to accept the fact that full employment is not a feasible objective. With automation the decreasing labor/capital ratio will make the required investment rate an impossibility given the increasing concern for pollution. Second, the skill requirements for jobs where the demand exceeds the supply will mean that the untalented will increasingly have no productive role to play in society. Make-believe work is both cruel and counterproductive if it increases the feelings of inadequacy of those thus employed. The federal government needs to admit openly the decreasing prospect for meaningful employment and address the problem within a realistic framework, that is, how to devise an employment policy for the transition period. Without such a policy, the problem of income distribution is likely to increase not decrease. Labor unions will secure increasing benefits for a shrinking membership, rentier income will remain concentrated in the rentier class, and a growing number of displaced persons will writhe in the frustration of a state of permanent unemployment which society perceives as temporary.

The basis for paying each individual a guaranteed income is the social dividend on his share of society's capital. However, the transition from an ideology of income distribution based on the marginal value of labor to an ideology of income distribution based on social dividend will be a long one. The temporary political expedient is the negative income tax with a gradually increasing floor on income. Next, the dwindling supply of jobs should be rationed better by a decreasing work week, late entry into the labor force, and earlier exit from the labor force. As the work week decreases, two shifts will be required for the present 40 hour week.

Finally, tax laws must be changed to eliminate the perpetuation of a rentier class.

A second area in which more definitive policies must be established is the creation of metropolitan government, whose primary responsibility is providing services to the entire metropolitan area. This means that second level governments should be reconstituted so that metropolitan area governments constitute one class of governments and rural areas another. Within metropolitan areas a more comprehensive effort must be made to partition the area into functional communities with distinct identities.

Finally, large scale social experimentation is required to create viable institutions for informational society. Currently the technology (such as CATV and remote terminal computer systems) is available to experiment with informationally decentralized organizational structures where information is transported to people, not people to information.

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