

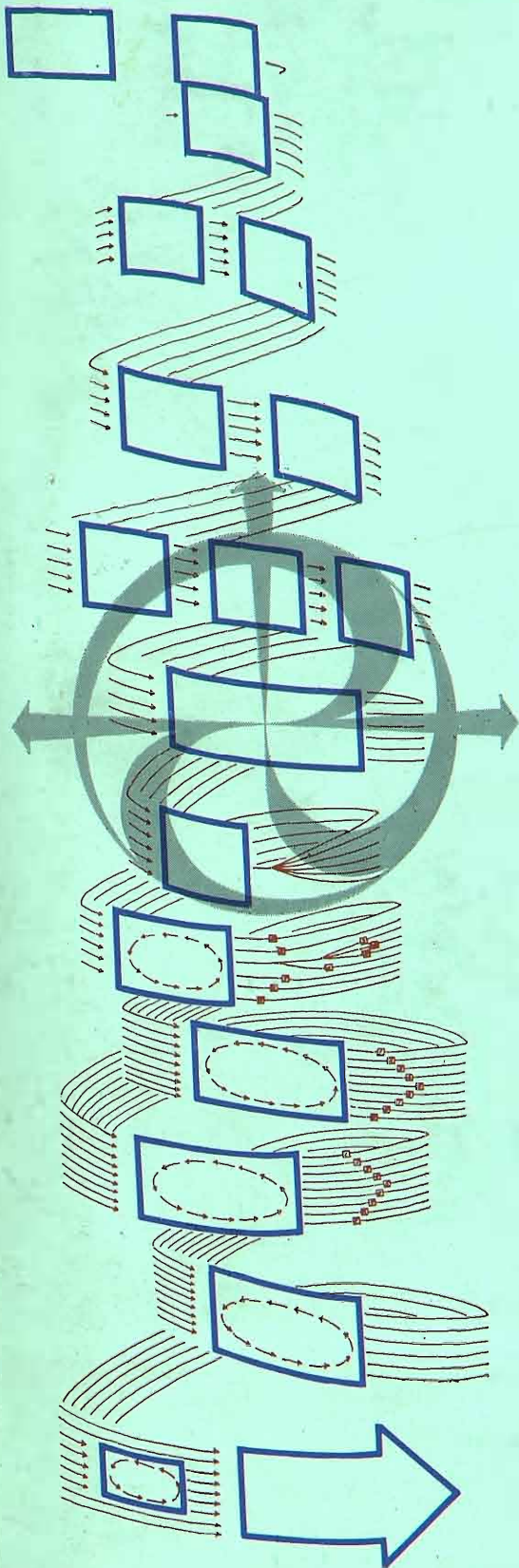
# HUMAN NEEDS NEW SOCIETIES SUPPORTIVE TECHNOLOGIES

COLLECTED DOCUMENTS PRESENTED  
AT THE ROME SPECIAL WORLD  
CONFERENCE ON FUTURES RESEARCH 1973

VOLUME III

IRADES  
Institute of Research and Education in Futures Studies  
Roma (Italy)

WORLD FUTURE RESEARCH CONFERENCES  
Continuing Committee



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*CONFERENCE PROCEDURE*

**GROUP 4**

**Art as an indicator of the future and  
as a means for the development of  
man's creativity.**



THE PLACE OF ART IN THE PSYCHOLOGICAL, SOCIAL AND  
CULTURAL RECONSTRUCTION OF THE FUTURE

By: Takdir Alisjahbana  
Rector of the Universitas Nasional;  
Chairman of the Akademi Jakarta;

I. Art is one of the most characteristics human achievements, if we compare human behaviour with animal behaviour. Beauty in animal behavior is an attribute of nature, art; however, is a product of the evaluating capacities of the human mind. Since the human mind with its evaluating capacities is the source of all human cultural life, art is an inherent part of every personality, every human society and every culture. Indeed the aesthetic evaluating process must be considered as an a priori of the human mind, like the scientific, the economic, the religious, the power and the solidarity evaluating processes. Compared to the economic evaluating process, the power and the solidarity evaluating processes, and even to the scientific evaluating process, it represents a higher degree of spirituality, since it transcends the concreteness of the material reality with which it operates. With the religious evaluating process it forms the expressive aspect of the cultural process, i.e. religion as well as art does not face the natural reality as reality, but as expression of another reality: in religion of the Holy or God, in art of beauty. Both these processes are absolute, i.e. the artistic products as well as the religious acts as realization of the Holy are complete in themselves, and are not supposed to be developed. Quite different is the progressive cultural process, which consists of the scientific and the economic evaluating process and which operates with the natural reality. The products of the progressive process in the form of scientific knowledge and economic goods are accumulative, i.e. they change and develop in time.

II. In every integrated culture as the realization of a system of values by a certain social group at a certain time, the total aesthetic expression manifests itself in a system which is structurally related to the religious, scientific, economic, solidarity and power or political systems. The integration of the various values in the configuration of the cultural value system

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1. For a more elaborate discussion of the problems of values and culture, see G. TAKDIR ALISJAHBANA, Values as Integrating Forces in Personality, Society and Culture. Kuala Lumpur, University of Malaya Press, 1966.

is based on the Weltanschauung, the Denkform or at least on the total cultural atmosphere, and manifests itself in mutual enforcement and fertilization. In the case of a culture in a crisis, in which the integration of the value system is weakened by new concepts and ideals, or by cultural inner exhaustion, not only the total integration of the cultural values is challenged, but also the separate value areas lose their cohesion and consistency.

The cultural process as realization of a system of values takes place as a psychological process in the personality and as a social process in society or in the social group.

With the determination of the aesthetic evaluating process as a psychological, social and cultural process, we have indicated the place and the meaning of the aesthetic value or art in the great totality of culture, be it in its integration and consistency, or in its disintegration with its many tensions and conflicts.

III. The ubiquitous and all-embracing crisis of our time is characterized by the disintegration of the personality, the social group as well as the culture as a totality. In order to understand this greatest crisis in human history, we cannot escape to go back to its sources, i.e. the Renaissance in European history.

The decisive meaning of the Renaissance as the very source of modern society and culture was, that it gradually liberated the human individual from the norms and values of traditional society, and made it an active independent thinking personality, who took the responsibility for his own life and destiny in his own hands. Man's liberation from traditional concepts and collective norms opened the way for him to develop his full potentialities and capacities. He became a kind of superman, who conquered and molded nature, human society and culture. We know the expansion of European man and culture after the Renaissance, with its innumerable discoveries, inventions, conquests. Not only more than half of the globe became settlements, colonies and spheres of influence of European culture, but even the countries which were able to retain their sovereignty in one way or another had to accept European cultural values, and especially those representing the progressive aspect of culture, i.e. science, economics, and as a product of both, technology. We know that during the following centuries this Renaissance culture gradually evolved into our modern global culture, characterized by a huge industry and commerce, by mass production and consumption, and by the speed of transportation and communication, which enable ideas, concepts and goods



to move around the world as fast as radio waves and jet planes. A criss-crossing amalgamation of cultures, religions, ideologies and concepts with many trends and countertrends spread over the world, with its many dangers and also hopes.

IV. The liberation of man in the Renaissance, which has opened the road for the scientific, technological, industrial and commercial revolution, has during four centuries changed the configuration of the value system of European culture from an expressive one, i.e. dominated by religious and aesthetic values, into a progressive one, i.e. dominated by the scientific and economic values. Viewed from the psychological potentialities of the personality, this shift is one from the preponderance of feelings, imagination and intuition to the preponderance of discursive thought and economic calculation. It has the greatest consequences for individual, social and cultural life the world over. The rationalization and commercialization of life have weakened faith and belief as the integrating forces in personal, social and cultural life: feelings and imagination as the essence of religion and art have weakened, and even the warmth of love and solidarity has decreased.

The great religions, be it Christianity, Islam or Hinduism are experiencing a severe crisis because of the incursion of rationalistic scientific thought in their belief and faith. Thus rational modern man is beset with scepticism, and the loss of his anchorage in his religious belief makes him an easy victim of utilitarian ideologies or even demagogism. We know that the human family as the most intimate solidarity core of society has been challenged from many sides. Biological knowledge has challenged the holyness of sex relations, the modern economic relations and the specialization in modern life make the home less and less important for the security and development of the members of the family. Thus modern man is alienated and loney in the crowd. In the political relations the problems are even more threatening. The speed of transportation and communication, which have made all the states of the world neighbours of each other, have not only opened the road for cooperation and mutual help, but also the possibilities of tensions and conflicts have multiplied tremendously. Every local conflict has the tendency to become an international one, which in the face of the availability of nuclear and other devastating weapons could engender a new holocaust, incomparable with any in the past. It is clear that the national state as the creation of the Renaissance itself, has reached the end of its possibilities. In order to develop further, human culture needs

larger political structures. In the economic sphere the clash of national as well as group and class interests are not less dangerous, since they have the tendency to enhance the political conflicts between the national states. The commercialization of cultural goods, even of the most spiritual one such as the religious and aesthetic values, has disintegrating consequences in the totality of life. Even the sciences, the task of which is to uncover the secrets of nature, are not without problems. How can the enormous amount of knowledge collected in many laboratories, universities and research institutions be collected and coordinated for the further development of science itself? But more serious is that the uncovering of so many secrets of nature and life has threatened to endanger human culture and life itself through the annihilation of its very ethical structure, from which the various evaluating processes derive their forces and aims. As to the dangers of technology as a by-product of the progress of science and economics, I need only to refer to pollution, modern armament, the overpopulation of the world, the monotony of modern life, etc.

All these phenomena which go together with the progress of science and technology have far-reaching consequences in the psychological integration of the personality, as well as the social group. Mental diseases and social conflicts are common phenomena the world over.

V. It is in this context of the criss-crossing confusion of modern life and culture, that we have to consider the position and task of the modern aesthetic evaluating process of art. In four or five centuries medieval European Christian religious art has gradually developed into a secular individualistic art. The same process has spread to the other traditional cultures of the world. To illustrate this I would like to discuss the present situation of Balinese culture, which gradually has opened up itself for the modern world through political, economic, educational and commercial incursions. Already during the Dutch colonial time a conflict arose between Christian groups and progressive ethical Dutch scholars. Through its very nature the Christian missionary wanted to expand its proselytizing activities to the island of Bali. Dutch orientalist, however, considered the christianization of Bali as a threat to the existence of the very unique and artistic high culture of Bali. The missionary leaders were very disappointed and to a certain extend enraged,

that the very essence of European spirituality was not allowed to enter Bali, while as they literally said, Bali was opened for the flow of "tourist cattle". This is a flagrant example of Babylonian confusion in viewpoint and concept in our modern culture. But the fact is that the secularization, rationalization and commercialization of Bali go further and further through government intervention in law, education etc., and through the contact of Bali in commerce and cultural exchange with the rest of the world. The Indonesian government has lately discovered that tourism is one of the rich financial sources in modern society and it is now in the process of developing Bali into the greatest center of tourism in Indonesia.

VI. In his concept of "musée imaginaire" André Malraux indicated the overwhelming quantity of art expression, which is accessible to modern man, from all epochs of history. Everywhere this dazzling variation of styles and composition of art represent many stimulants, as well as confusing unintegrated sensations and impressions. The first consequence is a secularization of art. Not only that the former religious art is considered as expression of art only, free from its religious meaning, but also the artist himself creates more and more profane art in the sphere of his secular society and culture. A second consequence is the relativization of aesthetic values according to cultural areas, groups and individuals. In the individualization process since the Renaissance art has become more and more the expression of the individual aesthetic evaluating process. And add to this the overwhelming array of art expression in multivarious world-views, ideas and concepts, we are able to understand that the artist attempts to limit himself to the expression of a common denominator of all art phenomena. His concern is to create pure beauty, free from all "unaesthetic" elements. Thus is the modern slogan coined: art for art's sake. On the other hand the decrease of spiritual values in the atmosphere of mass production and consumption, and the dominant concern of modern progressive man for sensate pleasure and enjoyment, unavoidably determine the commercialization of noisy, experimental, popular art as one of the salient characteristics of modern culture. Sex which has been liberated from religious taboos and which since Freud is clearly recognized as the most basic and common human drive, soon acquired a dominant place in this hedonistic popular art.

But there are other not less important aspects of modern art, which express the climate of modern society and culture. In order to retain its suggestive

or evocative force, contentless or objectless modern art in its isolation as well as in its rebellion attempts to achieve its art expression with new provocative concepts, which contrast sharply to the concepts of traditional aesthetics. Thus esoteric modern art trends which consciously apply dissonance, disharmony, deformation, alienation and paradox, and attempt to make the most bizarre analysis, construction and synthesis, come into being. Modern art is undeniably the truest expression and at the same time a clear mirror of disintegrated and confused progressive modern man, his society and his culture.

VII. In order to be able to determine the task of modern art in the reconstruction of the modern world, we have to reflect on the future of modern man, his society and his culture against the background of the many cul-de-sacs of the present social and cultural situation. It is clear that the key word in our time is integration, if we want to create a new viable cosmos out of the chaotic situation of our time with its many tensions and conflicts. The amalgamation of innumerable cultural goods from the past as well as from the present have to be rearranged and remolded on the basis of the present interdependence of social and cultural life on our planet. A new worldview, a new Denkform and a new social and cultural climate must be shaped, which will enable man to restructure his individual, social and cultural life on the basis of the unity of the world and of human destiny.

In this enormous task mankind is facing the greatest obstacles and impediments. It turns even out that the most spiritual value or evaluating process, i.e. religion, poses the greatest difficulties for mankind. The concept of the Holy as the ultimate ground of the universe and human existence, which during the axis of history around the fifth century B.C. - to use Karl Jaspers' terminology -- has reached its absolute universality in the concept of the one God, the all-embracing Brahma or the ultimate Nirwana, during the millennia has proven to be unable to create a solidarity between men. Since the religious value as expressed in the various holy myths is the deepest embedded in the human mind and provides man with an all-embracing and ultimate ethical consciousness, religious conflicts belong still to the most insolvable conflicts, and intolerance is still one of the most common attributes of religious man. Maybe that through the fast spread and intermingling of followers of the various great religions during the last century throughout the world, each claiming absolute truth for his religion, possibilities are opened for a certain skepsis in the mind of religious man.

This skepsis - we hope - brings them to the conclusion that all men are creatures of God, or will return to Brahma or Nirwana, regardless of their creeds and rituals, that every religious system is the expression of a basic human urge to penetrate into the ultimate ground of man's life and the universe, and to find security and salvation for his limited terrestrial existence. Viewed from the standpoint that religions are the result of the evaluating process of the human mind, and thus belong to cultural phenomena, which change and develop in time, we may surmise that a greater religious structure than the existing ones is in store for mankind in the future. In this light the ecumenical movements in various religions, as well as the converging tendencies in religious thinkers like Sri Aurobindo, Pierre Teilhard de Chardin and Mohammad Iqbal are meaningful.

Not less exasperating are the unintegrated political structures of our time. Although the sovereignty of the national state has lost some of its former meaning after two devastating world wars within one generation, it does not yet seem likely that the national states in the foreseeable future will dissolve into a superstate or federation with far-reaching competence in law, justice and security. Nobody can foretell how the relation between the three existing great powers, the U.S.A., U.S.S.R. and China, will arrive at a new structure, which will enable a gradual integration of the political powers in the world. The history of the League of Nations as well as the United Nations Organization does not allow us much space for optimism, although outside the political arena, more and more people have become aware of the necessity of more goodwill, cooperation between nations, if we want to escape the annihilation of mankind by the products of its own ingenuity.

Also in the economic relations the controversies are still too strong, not only between the economic giants in the world, but also between the rich and the poor countries, and between various classes in every nation. Although there are tendencies, which indicate in the direction of a compromise between the two great economic systems, i.e. capitalism and socialism, in the framework of the present political system which reflects also economic controversies it is not likely, that soon a new ideology, which takes into account the importance of the entrepreneurship of the captains of industry and commerce as well as the necessity of economic and social justice, will spread over the world. It is clear that the economic and social problems are closely related to the political situation.

How easy it could be to solve the economic and social problems in the world, if the tremendous expenses for armament in the various countries could be reduced to that of a relatively simple internal police force, so that a huge amount of money and material would become available for the raise of the standard of life of man in the whole world.

It is without doubt that with the prominence of the scientific evaluating process in our time a universal basis of reality, Denkform and logic has been provided for the unity of the world and of cultural expressions. Not only universities, airports, hotels, banks, factories are nearly the same the world over, but there also seems to develop a certain collegiality and solidarity between scholars and other intellectuals from the various races and nations. The rational attitude gives a deliberate calmness and humaneness to individual as well as social behavior, while the scientific logic and methods of research guarantee to man a more exact and objective knowledge of nature and his surrounding world.

But most decisive in the efforts to overcome the present confusion and criss-crossing tensions and conflicts is the solidarity value: love, friendship, empathy and sympathy, mutual help and responsibility. It is the weakening of the solidarity value, which is the cause of the disintegration of traditional social groups. In the framework of the extension of the area of human interaction through the speed and spread of transportation and communication, new broader feelings of solidarity are necessary to create broader areas of goodwill and cooperation, so that the negative and controversial factors in our society can be limited to a minimum. In the last analysis in our epoch the whole world has become a unity. Religious intolerance, political strife and struggle between nations, classes and social groups, economic competition and conflicts, which still dominate in the modern world, can only be transcended if we will be able to awaken in man a broader solidarity which includes the whole human race on our planet.

VII. We have described in a nutshell the various tensions, conflicts, difficulties and impediments in our present social and cultural crisis beside the great potentialities and hope for peace, economic prosperity and human happiness in the arising world society and culture. Our task is now to indicate the possible task and contribution of the aesthetic evaluating capacity of the human mind in the great psychological, social and cultural transformation of our time.

No evaluating process has been so identified with the act of creation as the aesthetic evaluating process. While the scientist investigates and discovers existing laws of nature, it is especially the artist who creates something new out of existing material. Newness is indeed the special attribute of art. In this sense the artist is akin to the engineer, who constructs new structures. But while the engineer creates his structures such as buildings, bridges, ships, etc. for the utility of his product, it is the privilege of the artist that in the act of creation he is disinterested: the act of creation itself is his aim which gives him satisfaction and fulfillment in itself. In this sense the artist with the mystics are the most detached men in this world.

Through his senses the artist acquires perceptions and impressions from his surrounding world. In contrast to the scientist and economist he is, however, not interested in the natural reality. Instead his rich feeling and his lively imagination arrange the facts of his surroundings in combination with and in the configuration of the products of his imagination into a new structured totality of his own making. There is always something new in a piece of art, be it a painting, a sculpture, a piece of music or a poem, which is characteristic of the personality of its creator.

The creation of a piece of art is complete when it reaches other people and evoke the same feeling and imagination in them. Every good art must be evocative, suggestive. Thus is art as a social fact a very powerful means of communication. It communicates messages and influences people's feelings and imagination.

As a strong evocative and suggestive means of communication art represents a great power in society. For how detached an artist would like to be in his creation, real art has always a content, a message, quite different from the blooming of a flower or the song of a bird in the fields. In this context the slogan of: art for art's sake is a typical phenomenon of our time of isolation, of specialization, of disintegration.

In the totality of the personality the creation of art has never been an isolated act. Scientific, economic, religious, political and solidarity factors always play a role, dependent on the special value configuration of the personality of the artist and of the society and culture in which he lives. In this sense the artistic creativity has a social and cultural Formkraft, power to shape, to mold society and culture. And it is in the

configuration with other values that we can speak of hedonistic art, i.e. when it is combined with the urge for materialistic comfort and sensate pleasure, or of erhabene Schönheit, when the aesthetic value is combined with the religious value of the Holy. In the ideological controversies of modern time art has been combined with the political value, while in the broad field of applied art the aesthetic value only serves to enhance the value of economic and other goods.

IX. After this short analysis of the psychological, social and cultural crisis of our time and the process and meaning of aesthetic creativity, our task is to indicate in which respect the aesthetic evaluating process can contribute to a new re-integration of our present psychological, social and cultural life, and thus contribute to the shaping of the arising world society and culture.

We have said that every culture is based on a certain Weltanschauung, a certain Denkform, which crystallizes in a certain value system.

In the atmosphere of the expressive culture the value system takes the form of a holy myth. It is not very likely that modern man will accept a new holy myth, even for his own salvation. It is, however, obvious that the creation of such an all-embracing new psychological, social and cultural structure, cannot be achieved without any belief, at least in man himself, in his potentialities, his hope and aspirations. Out of this all-embracing belief should evolve a new ethical system, expressing the new value system and giving an all-embracing responsibility to modern man. In the context of our progressive culture in which scientific and economic values play such a dominant role, it is unavoidable that his new belief must be constructed on a broad basis of objective knowledge and rational thought, and must take into account the great economic potentialities and achievements of modern man, which should be retained and further developed in a future social and cultural order.

Even the political organization must be restructured, unifying the world and mankind under a worldwide accepted authority. If the political organization takes care of the "vertical" social organization of society, the solidarity relations are the "horizontal" cohesive forces, which wrap mankind in an all-inclusive warm unity and mutual responsibility. In this broad new religious atmosphere social and cultural ethics acquire their ultimate synthesizing forces in a higher transcendence for the unification of the human race in a universal solidarity.



It is clear that especially for the establishment of this all-embracing religious and solidarity structure, much creative work must be done. It is here that the artist with his fertile and constructive imagination, his rich elan-full of feeling and suggestive evocative Formkraft has a great task. He has to stimulate and initiate in every field of life the creation of new forms to express the human need and ambition for a more harmonious world order to achieve a new golden age, richer, more creative and hopefully happier than in any epoch of history.

It is also to be hoped that in our world full of tensions, conflicts and struggle, the artist can implant an atmosphere of creative detachedness and humaneness in the service of the great idea of building up a common future for the human race. It is clear that after the epoch of erratic uncovering of new layers of reality and relentless experiments with empty forms of art for art's sake, the time has become ripe again for a new serious art, rich in contents like in the great epoch of Dante, Michelangelo, Brunelleschi and Leonardo da Vinci, when the artist had the courage and capacity to create the great synthesis of Platonic idealism with the new discovered reality of man and nature. A new avant-garde has to arise in which the artist takes an active part in the reconstruction of man's personal, social and cultural life, not as servile servants, but as independent creative co-worker with scholars, economists, political, religious and social leaders. It goes without saying that in this new task he has to leave his social and cultural isolation and has to imbibe the rich knowledge, achievement and aspirations of his time in the interest of his creation.

It is my hope that in our further deliberation during this conference we will be able to develop concepts, methods and programs of research on the feasibility of the realization of the new role of the artist and his art in the arising world society and culture.

By: Stephen Arnold  
 Assistant professor,  
 Department of Comparative Literature  
 The University of Alberta

### I. Introductory Summary

At previous general futurology conferences fears have been expressed that futurology is becoming a jargon-ridden discipline in and of itself, and pleas have been made for the futurizing of all academic disciplines in order to enable everyone, and not just an elite of technologists, to participate in the creation of the future. Futurology as a discipline and type of research with its own methodologies is virtually unknown to practitioners of almost all branches of the literature industry. In spite of the fact that either through osmosis or through pedagogical guidance, formation de l'esprit is accomplished in most cultures largely by means of literature, neither scholarly concerns with nor pedagogical approaches to literature have changed substantially since it began as a discipline in ancient Greece and China. It has always been a bastion of conservatism. Contrary to much of the writing they study, writing which is open to the future, those who teach and interpret it also often disarm and pervert it, using it to prepare young minds to live in the past instead of to guide them towards future consciousness.

In spite of the habitual and frequently unwitting backward look of its disseminators, literature could be a more dynamic force in shaping the future. Although utopian fiction might be the most obvious kind of writing for a literary futurologist to analyse and discuss, all kinds of literature can be approached with a futuristic bias. By formulating some questions and soliciting others suggestive of possible applications of futuristic methodology to literature, this paper attempts to show where realistic strategies might replace commonly naive and idealistic ones when a teacher, scholar, or critic wishes to use his subject as a means of intervention into problems which impede real progress.

The questions, or litmus test offered here, are designed to provide teachers and students with reference points which help them to study literature from a future perspective. The "future consciousness" tested for (in both the observor and in the literary object observed) is of two kinds:

- 1) it is consciousness of the future as the most important determining factor in individual and social existence, i.e. it is an informed awareness of those things which threaten earth's inhabitants with increased misery and possible extinction, and at the same time an awareness of the necessity of averting disaster and of promoting a life of material and spiritual fulfillment for all; it is the kind of consciousness or animating spirit of those who refuse to be blindly pushed by an ever accumulating past, and who instead are pulled by an urgent and promising future;
- 2) it is consciousness in the future; it is the type(s) of human cognition and sensibility that will be typical in the future when, hopefully, ecological equilibrium and social and economic equality will have been established. Although as eminent a social engineer and poet as Mao Tse Tung has said he has no idea of what consciousness will be like in this future, many literary movements and independent writers have tried to demonstrate this consciousness. (Examples will be discussed). Whether their visions will be proven right or wrong is of minor academic importance. What is important is that such topics become a central part of the study of literature.

Consciousness of the future looks for means to bring about the various kinds of prophesied-projected ends, or consciousness in the future. Thus the "litmus tests" could be divided into categories of "means" tests and "ends" tests which allow us to speculate in an informed way on how much any work from any period and place is a potential force for helping us realize or for preventing us from realizing desirable futures.

Prior to reading the paper, those trained in the humanities are encouraged to read the way scientists read, i.e. they should stop here, now that a problem has been posed, and they should think it through themselves in order to read more critically the arguments that follow when they resume reading. They should reflect on the role literature had in determining their own world-views, on the way literature was "taught" to them, and on what they might do if they were to "teach" literature in a manner that might make it one more fulcrum for turning over the rock of the future instead of letting it remain a conservative force. They are also asked to participate in the formulation of a set of questions (and to seek to publish them) which each teacher, scholar, and critic of literature can ask of himself, of the books he presents, and of the characters in them, and of his students in order to make futurology yield an important perspective for making the enterprise of literature more constructive in terms of futurological ideology.

## II. Why Teach Literature? and On What Should Literary Futurology Focus?

"Art" is an industry as well as a permanent affectation of human consciousness. Here I will confine my remarks: 1) to literature, the only art I profess to know anything about in a professional way; and 2) to the pedagogical and scholarly branches of the total production-consumption enterprise we call literature. The second of these two limitations is imposed because the social history of literary production and consumption, and the nature of the literary artist himself make moralising arguments about what the artist should and should not do, rather unrealistic. Good artists are good scientists. They keep our horizons open. (Someday all men may be artists, but that dream of many utopian projections will not be treated here.) If our deliberations at the Rome Conference are to have any shaping impact on the future, I think they would be more effective if they were to be directed at those who now find it their jobs to distribute, interpret, and classify literature, the publishers, professors, and critics, the middlemen of the business, whose tool is reason and whose tasks should be to make us conscious of those aspects of the art which make a contribution to the future, and make us critical of those aspects which do not.

What can we predict about the future of literature?:

- 1) Literature will continue to exist, in spite of the fact that at least since Hegel there has been chatter about the death of art. Recently Sartre (in Qu'est-ce la littérature, 1947) and McLuhan and many others have portended the ultimate demise of literature in a kind of permanent post-Gutenbergism. But literature is still with us and will stay with us. It is probably an instinctual (implying we are all artists, potentially) manifestation of the human need for definition and transcendence of definition. A future society in material equilibrium will be basically a leisurely and creative society, and activities such as reading for pleasure, which is now declining in the "developed" world, but increasing in the "developing" world, will be recovered and regrafted to human consciousness when people will have time to develop themselves;
- 2) Literature will continue to change in form and content as the world changes;
- 3) All literature, understood in an extended sense to include the verbal and narrative components of all art, will appear different to the future than it does to us; that is, as it ages, the aesthetics of literary production gets closer and closer to ethnology;

- 4) Literature will continue to be intrinsically ideological in nature and in exploitation, conscious and unconscious.

In other words, the activity-institution of literature, like political power, is an enduring part of human being-and-business, and the ultimately important changes it will undergo will be in who produces it, and under what conditions, who controls its distribution, and for what ends it is used....

If we place the business of literature in the large contemporary context of human survival, as problematically seen by futurologists (the rhetoric of whose Cassandra cries comes, unconsciously perhaps, from literature), literature as now practiced in the "developed" world may seem a silly frill, an institution whose irresponsibility is difficult to tolerate when we realize that we and the rest of the world's motley literati are playing Neros, fiddling with poetry while we teeter on the brink of the extinction Robert Lowell says we have "talked...to death". The North American new-left slogan of "if you are not part of the solution you are part of the problem" seems somewhat apt for us, and on this note let me move away from wearying clichés and polemical speculations and toward practical suggestions about literature and the future and how we might try to be part of a solution instead of bewildered or unconcerned (professionally, at least) bystanders.

There are three fundamental questions we must ask:<sup>1</sup> Why teach (criticize, analyse, review, etc.) literature? What literature should be taught? How should it be taught? Because further discussion will lead to empty, idealistic philosophizing, I would like to answer the first question by re-iterating that in addition to being a source of pleasure, literature is one of the most important vehicles for forming minds and sensibilities. It embodies ideologies, and is a form of power, supportive or subversive, depending on its context and handling, i.e. depending on which items and what aspects of them are selected by literati--a genus of cultural mandarins--for consumption. Because they help create and focus states of consciousness which underlie the social thinking of the "educated", their power is not to be under-estimated.

Therefore, starting with the assumption that literature is taught in most cultures by lay people and by professionals, from the cradle through school and after, a far more important question for us to consider is: "What literature should be taught"?

### III. What Literature Should Be Taught?<sup>2</sup>

A schematic answer is easy to give--works which have qualities of form and content which lend themselves to futurological analysis--but the details, the actual choices of books to be taught are up to each teacher who can know only a small portion of the countless texts available. (A universal curriculum, as was proposed in Bucharest, is unrealistic. Leaving the question of why? aside, who would agree on its components?) It must be stressed that all works of literature are fruitful objects for futurological analysis, and that such analysis involves an intrinsic approach (so dear to the formalists, who still dominate literary scholarship) to literature because it examines time consciousness, half of the two human organizational axes of cognition--time and space. However, of course, some works are better than others....

Which works have the greatest specific gravity for futurological uses? Whatever the merits and demerits of books like Limits to Growth and World Dynamics, their inclusion on syllabi of literature courses might be salutary because of the pertinent discussion they would provoke and focus. If teachers do not feel they can justify their use because of time and financial considerations, they could at least talk about them with students. The implications of these books' predictions should be clear for future-minded literary critics and historians alike. Future literary scholarship (which should be made into literary good-citizenship) will be preoccupied with the importance of Third World liter-

atures, and will deflate the current value of the existential absurdists.<sup>3</sup>

If we project an imagined future for a moment, and then criticize the dominant, absurdist literature of the "developed" world today in terms of it, the study of this currently fashionable literature will certainly appear of questionable value. Nothing in absurdist literature announces or prepares a future world of co-operation, freedom, and joy in any way. All is bleak, tragic, solipsistic, atomized individualism. Every window on the present and the future opens on prison bars. Death, not life, is its heart. Yet, ironically, even many marxist critics are spellbound by it, saying that Kafka, Beckett, Ionesco and the others are the voice of our age, the articulators of the negative component of the dialectic. Though they would fail all ends-tests, many still think these writers pass a perverse means-test for future consciousness, as if reading would make us so disgusted with ourselves and our world that we would willfully, magically, change it overnight. Such admiration for those who wallow in alienation should have stopped with Kafka and Celine, who articulate better than anyone else the horrors of bourgeois civilization, but it appears that we are so caught up with the negative that the positive has been forgotten. Not so in the Third World.

A summarizing example of Third World literature might be Aimé Césaire's Cahier d'un retour au pays natal<sup>4</sup>, a work of immense stature when judged from all present intrinsic and extrinsic standards of literary excellence, and a work which illustrates better than any other both consciousness of the future and consciousness in the future.

Cahier... records an emotional prise de conscience révolutionnaire as Césaire returns to Martinique from a long stay abroad in France. At the end of dawn, symbolizing the end of the black man's (and, by explicit extension, Everyman's) nightmare of oppression, Césaire looks out over the island's major city from atop a mountain, lamenting the state, baffled, of the people. Gradually he moves from despair to defiance of those who have colonized the black man. In both evangelical, discursive language, and in magnificent surreal images, the poet builds his major themes: opposition to purely rational European language; aliénation; revolt; Black history; and future liberation. His images are fetched from deep in his mind, ab-origine, from below the white-washed veneer of European consciousness which has separated his people, and whites too, from the beauty of communal living with nature.

In a surreal, "primitive", and perhaps future state of mind, Césaire imagines a dereified reality in which the earth is new-born, prismless, and where all beings are free and fraternal, living in nature instead of against nature, and where no hierarchies exist. In surreal imagery he identifies with trees, rivers, animals; the entire universe becomes a two-dimensional extension of himself--though not solipsistic--joined communally with other selves. He feels his mission is to become the voice of his land and of its muzzled people, but such images of future freedom and joy find themselves choked by images of present reality: images of rotting fatalism among those he must awaken; images of horizontal violence among those men freed in statute only, instead of vertical violence against their rulers; and images of the oppressor's existence within the consciousness of the oppressed who have adopted the enemy's définitions of them as lazy, stupid, and inferior in every way to whites and their assimilated black lackies.

This great poem, whose major implicit theme is ecology, became the Bible of the racial, cultural, and political ideology known as Négritude, a movement (now out of fashion) which culminated in the political independence of many former African colonies in the 1950's and 1960's. It is a poem that moved history and that projects the future, yet is little known in the "developed" world. What better choice could there be to put alongside another classic voyage home, Homer's Odyssey? What better way to bring out Homer's future consciousness and to demonstrate how Homer was different from us, and not our contemporary, as he is often made to be.

Establishment of a syllabus is one of the most crucial tasks of a teacher, but it is one of the most neglected. We should make every effort to bring Third World literatures into our courses and to reassess the "older" literatures in light of them. ("Older" is italicized because the Third World holds many surprises--for instance a rich literature in Swahili that has grown continuously for 700 years--longer than most European literatures.) In doing so, however, we should try to shape future literary history by de-emphasizing genetic influences and by emphasizing differences more than affinities. In general literature courses at all levels of instruction, teachers should beware of perpetuating the past in counter-productive ways. In Canada, as in many places, the national literature is sadly neglected, in spite of its richness, and consequently students come to have the impression that culture comes from "over there", beyond their borders of time and space, instead of culture being what it is--a living, almost tangible institution that all take part in through creation, modification, performance. Too much cosmopolitanism frustrates (if not prevents) development at home. Therefore the focus of discussion in literature courses should be such that it nurtures an appreciation of home as unique, and taught in a way that emphasizes spatial and temporal differences between cultures, and not a falsifying sameness, a "universalism" for which Europe provides the perfect, Platonic, essential models which everyone else imitates poorly, a "universalism" which breeds lack of self confidence among those to whom it is exported, and smug intolerance among those who export it. (It was no coincidence that one of the most absolutely repressive places in history was 17th century France, whose broadly exported "doctrine classique" preached a universalism that identified with misunderstood ancients of Greece and Rome, and produced few works inspired by contemporary themes and events.)

In courses which confine study to one author, there is no reason why a few additional readings cannot be added for the sake of opening future perspectives. And if the genetic approach is insisted upon, then many progeny of the "classics" provide progressive choices. Few writers display future consciousness to the degree Dante did in his Commedia. A course devoted to it could be expanded to include, say, Leroi Jones' The System of Dante's Hell (New York: Grove Press, 1965), a powerful Third World novel. The rebellious romantics used Shakespeare to justify their innovations. The soundest advice given to and by the Russian Socialist Realists was to study and imitate him. The Surrealists regarded him as a forefather. Important derivative plays by Bert Brecht and Aimé Césaire testify to his enduring importance to the oppressed. Usually thought of as a political conservative, he nevertheless has been and will be rich in latent future importance. This quality should be studied. Analogous opportunities are legion.

A result of reassessment of Western literatures in the light of Third World literatures (and other "progressive" literary phenomena) will, however, demonstrate to many that, culturally and futurologically speaking, though not technologically, the Third World is the developed world, and the West the underdeveloped, and neglected or misunderstood groups of writers in the West will be revalued. In this sense the entire world is underdeveloped in one way or another--those who have something approaching future culture have little technology; those who have technology approaching the future should trade it for soul.<sup>5</sup>

Among Western writers there are, of course, many who have deliberately written with the future in mind, and who deserve more attention paid to this neglected aspect of their work. Few critics measure Brecht according to his desire to create a collection of works that would be a literary Bible for a

future communist world, yet his canon definitely could be discussed according to how and to what degree a communist (i.e. classless, end-point) society would find the form and content of his plays, poems, and stories supportive of communist values. All focus seems to be on the socialist (i.e. class-bound, transition-stage, means-to-an-end) content of his work, or, sadly, on aspects irrelevant to the future. Many individual writers know this dilemma.

Two groups of writers, the Surrealists and the Phenomenological Realists (the former a school, the latter an arbitrary grouping) represent the largest number of deliberately future-conscious writers in the West, excepting, perhaps, the utopian novelist tradition. It is commonly thought that Surrealism, the most influential literary (and anti-literary) movement in history, died with the Second World War. Actually, as a movement, it was disbanded in Paris in 1969, three years after the death of its founder, André Breton. Elsewhere in the world, it persists. In Venezuela, members of a Surrealist group formed in 1961, "Le Toit de la Baleine",<sup>6</sup> struggle to publish in spite of persecution by censorship and even jailing. Surrealism, a form of revolt in Europe, is a repressed indigenous style in Latin America (and in much of Africa); it is the free, poetic, pre-Columbian mode of consciousness which permeates the region's literature in the form of "magical realism" (Alejo Carpentier's term). It was also the literary movement which led Aimé Césaire and others to rediscover and reassert the dignity of aboriginal consciousness. Though space does not allow here for a discussion of its formal qualities, it must be stressed that the Surrealists strive to demonstrate the beauty of consciousness in a future age when material restraints caused by inequality would be corrected by revolution.<sup>7</sup>

Most poets who are Phenomenological Realists once had some connection with the Surrealists. The deans of the mode, Francis Ponge and Pablo Neruda, and others like them, often write without ego involvement, showing no sense of alienation, letting the world and its objects speak for themselves. Traditional poetry always uses language in a way that entails some degree of metaphor or even allegory. Things, and the words that represent them, are always used as mediators, as meaning something other than themselves (e.g. in "Le vierge, le vivace, et le bel aujourd'hui" of Mallarmé, the swan ("cygne") is a sign ("signe") and a symbol which signifies many things, concepts, etc.), and readers decode or play with such poetic language in an anthropomorphic manner, approaching the world in a deductive way, always beginning with themselves and imposing themselves on the world. The Phenomenological Realists refuse this mediating use of language which always makes an object a symbol of something human. The world is approached with respect. A refusal by the poet to anthropomorphize, and an attempt to minimize metaphor, combine to lead the reader to grow by induction, by experiencing something integral and apart from himself. A kind of intellectual imperialism typical of most other poetry makes this poetry truly revolutionary. In a profound, formal sense, it is ecologically conscious poetry of a future man who will have ended his Faustian desire, inherited from Genesis, to dominate the earth by subjugating all other beings and by creating hierarchies.<sup>8</sup>

These are only a few of the considerations (questions and movements) a futurologist-teacher must take into account when designing a syllabus. I myself leave much of the syllabus open to the students' choice. This brings us to the final section of this paper, and the most immodest—"how to teach". As a summary of the section now completed, the reader may form his own litmus test questions by turning the assertions found there into questions: e.g., "why do I teach?", "how does my syllabus reflect the futurological concerns I wish to promote"?, etc.

#### IV. How to Teach: Some Humble Suggestions

The most important place to begin is with the students' thoughts and feelings about the future, and next with a discussion of what they want to do in the course. In talking with students from industrial nations about the future, I have found ignorance, fear and apathy instead of the idealistic enthusiasm of my own, the previous generation. Well managed discussion can, however, generally shame them into some interest in participating in the creation of the form, content, and justification for the course. Since one prediction ( a projected wish based on necessity) of most futurologists is that co-operation, instead of competition, will be more important in the future, I manipulate the classes far enough to get them to adopt group projects, a way of studying the future by living part of it. Since I choose only a minimal syllabus, they must agree on the rest of it. Last year in an advanced World Literature course, organized on the theme "utopian and distopian literature", the students chose as a group to analyse together the time orientation of narrators and characters in stories in "loveazines" (para-literature in magazines of the True Romance variety--literature that is far more widely read than belles-lettres literature, and perhaps more powerful in the sociological sense), and to write a collective story (now circulating among editors) as well as individual theoretical papers relating the two domains of literature. This year in a Third World literature course I will propose for consideration a project for two groups to nominate two writers from the Third World for the Nobel Prize.

The next problem is perennial--getting students to do their reading on time so that when lecturing is not taking place, informed discussion is. The infamous pedagogue Neil Postmann advises for problems to be made into solutions, a point well taken when it comes to tardy readers. Insist, occasionally, that students read no further than half way through the book. Then, as Brecht would have us do during the song, mime, narrative, and other interruptions of his epic theatre form, have students note down (to discuss later) what might have happened differently, why things have gone on the way they have, and how they might go in the part of the text they have not yet read. (When the game is played this way, cheaters are easily spotted--they have worked ahead.) This way, the future is the major focus of study.

A good futurologically-oriented teacher will also inform himself about the past futures of the work, i.e., he will study the history of a work's reception and, where possible, measure this history against the intentions of the author or of his characters. Dante, for instance, wrote his Commedia in order to give a common language to the Italian peoples who were fragmented by dialects and manipulated by those who spoke the only language of education (Latin), access to which was strictly limited. He wrote to urge separation of church and state, to end corruption, to re-instate the integrity of the Roman Empire, and so forth. He created a form of poem which others after him might use, a form so tightly knit that censors could not violate it because any tampering, either by omissions or additions, would be immediately noticeable in the resulting flaws in the intricate symmetries of the poem. In the face of these facts, some questions which have not been answered are open to useful conjecture: why was Dante virtually forgotten in the 15th to 18th centuries?; why is he important in the 19th and 20th centuries?; how is he useful to those of us who want to build a future?; why did Leroi Jones, the Black militant, write a novel based on the Commedia?; how will the future regard this poet (identified by the Surrealists in 1924 as their first forefather--why?!)?



On the macro-level we can ask of each work and its author: was he (she) a man of the future, prophetic in any way? (how, how not, and why?); what were the futures the work had prior to the present?; what might its present futures be?; does the work suggest an attitude toward the futuro (tragic? comic?, etc.)?; does the author suggest why or why not this is so?; what positive values (contemporary and projected) exist in the work that are not part of the world that produced it?; does the author (or any character) suggest a means for instituting such values? On the basis of such macro-level questions we can judge works as hindrances to, means to, or expressions of (and, of course, mixtures of these) the future(s) to come. Faust (Part II), once progressive, is now a reactionary apologia for consumerism, a projection glorifying man's rape and domination of nature. (The approach one takes to the book may, however, make it progressive.) Césaire's Cahier..., on the other hand, was a means to a present that shows some progress over the past that produced it, and it projects a future yet to be realized.

On the micro-level, such questions may be repeated, asked about each character. And the form may also be examined for its future(s) and its implications past and present. This includes imagery, its temporal and spatial dimensions, and so forth. The usual questions one asks of literature are easily turned toward futurological concerns.

## V. Conclusion

In talking about the art of the future and the future uses of art, we have actually been discussing revolution, and revolution, after all, is a matter of conservatism as much as innovation. Here I have (however immodestly) tried to suggest: 1) what and who some of tomorrow's revered antiques will be, and what and who of human literary culture should be permanently cast aside, unworthy of recycling; and 2) how literati might better marry practice and theory, how we might develop some of the means to insure there is no end. Skeptics about this enterprise will say that just as a man cannot raise himself by his own bootstraps (and that only a fool would try), humanity cannot stand on its own shoulders to peer over the horizon to get a view of better or worse things to come which will motivate efforts for change, that mankind's stature cannot be raised one jot or one tittle by such nonsense. Robert Jungk says we need to be "holy fools". Some writers are just that--not those who merely bewail or denounce the present or who are mired in the past, but those who announce, prepare, and preview the future. We should be their scientific, humanistic collaborators; we should shake our heads from the sands of non-existent "timelessness" and "eternal verities" and look around and ahead to change.

## VI. FOOTNOTES:

1. These were the questions continually returned to in the papers and debates of the décade at Cérisy-la-Salle in 1969; see the proceedings, edited by S. Doubrovsky and T. Todorov, Entretiens sur l'enseignement de la littérature (Paris: Plon, 1971), a valuable text for literary futurologists in spite of the absence of thorough and rigorous futurological orientation in the discussions .... In the text that follows in the present paper, please understand that "to teach" should be extended to "criticize, analyse, review", etc.
2. For a fuller discussion of this, as applied to only one national context, the Canadian, see my Third World Literature or Absurd World Literature: A Canadian, Future, Socialist Perspective (Toronto: New Hogtown Press, 1973), and James Ngugi's "On the Abolition of the English Department", in his Homecoming (London: Heinemann's, 1972), pp. 145-150, for its relevance to the teaching of literature in Africa.
3. For those who must start from zero, see Hans Zell and Helene Silver's excellent A Reader's Guide to African Literature (London: Heinemann's, 1972), which includes: an annotated bibliography of writing in French and English from Black Africa; descriptions of individual books and extracts from key reviews; specialist bibliographies on politically committed literature, children's books, articles on African literature; biographies of the leading African writers; and essential addresses of publishers and book dealers. It can be obtained for One Pound Fifty Pence from Heinemann Educational Books Ltd, 48 Charles Street, London W1X 8AH, or from P.M.B. 5205 Ibadan, or from P.O. Box 25080 Nairobi. Hopefully such valuable guides will be compiled for Asian and Latin American literatures, and for various "oratures" (oral literatures) which have been partially recorded. A good place to begin for Latin American is Jean Franco's The Modern Culture of Latin America (New York: 1968). A fine book which demonstrates some of the points to be made Below on the affinities between "primitive" oratures and some "modern" poetry, is Jerome Rothenberg's Technicians of the Sacred (New York: Doubleday Anchor, ca. 1968).
4. "Return to my Native Land" was written in the late 1930's. An excellent, inexpensive, French-English version (translated by Emile Snyder) is available from Présence Africaine, 25bis, Rue des Ecoles, Paris 75005, France.
5. Literature in the Third World is, of course, not entirely spontaneous and unencumbered by tradition. Where it is intact, it is highly traditional. But literary reassessment is taking place there, too. In Turkey, for example, intellectuals searching for a national culture to promote in order to diminish the disabling effects of imported culture, have found their hero in Yunus Emré, a 13th century poet with many surreal, primitive, and future (i.e. collectivist, etc.) traits, whose work has been kept alive for seven centuries among peasants but has been unknown to the "educated". See translations of his work in Action poétique, 53(1973), pp. 102-104.
6. See Martine Pasquet, "Le Surréalisme Hispano-Américain et le 'Toit de la Baleine'", Europe, 529-530 (Mai-Juin 1973), pp. 184-205.
7. I discuss one significant surrealist activity, collaborative writing, in another paper. See "Renewals in the Conception of Comparative Literature: Futurology and the Pedagogy of Literature", in the forthcoming Proceedings of the VIIth International Comparative Literature Association Congress (held in Montreal and Ottawa in August, 1973) ... One of the Surrealists' mottos is Lautréamont's "La poésie doit être faite par tous, non par un", hopefully a preview of things to come.

FOOTNOTES, continued:

8. I do not, of course, deny that anthropomorphizing and metaphor-based poetry is often progressive, nor do I believe it will ever disappear. Stephen Spender's lines "Eye, gazelle, delicate wanderer, / Drinker of horizon's liquid line" assert an identification between the sun (the eye of God?) and the human eye which is close to "primitive" vision, though of a different kind than surreal, yet which is nevertheless ecologically positive. The Phenomenological Realists, <sup>however,</sup> represent one of the few advances in consciousness as recorded by the history of literature. Surrealism and other romanticisms are actively conservative in the service of the future by attempting to regraft modes of consciousness which have been rooted out of us by Western culture's response to technology. Phenomenological Realism shows in its appreciation for precision a debt to technological consciousness, which it grows beyond. In another sense, however, it too is regressive, going back to Classicism and its respect for external reality and its suspicion of the subjective. All is new and old under the sun and eye.

## A WORLD WITHOUT POETRY

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Many who deplore the world we live in denounce it as a "world without poetry." Stress on the functional aspects of our technological civilisation has annihilated all the margins essential to the imagination, to improvisation and heart, restricting man's creative energies and esprit de finesse to exasperating mechanical repetition, and confining what Pascal called the esprit de géométrie. The artistic experience, dethroned and virtually banished from among those things that truly count, is condemned to vegetate, like a sort of phenomenon added to the chance technological shortcomings that emerge when technology has been unable or unwilling to assert itself, in a pathetic counterposition, sometimes taking refuge in hysterical attempts at libertine confrontation, sometimes weaving darkly the wool of its own disconsolate isolation.

Nevertheless, things do not always turn out as the Cassandras would like. Actually, the formal question applying to design and the projectual imagination shows how the very esthetic problem, taken as the innovative synthesis of the artistic experience's formal data, has found a precise and significant answer in the great debate on innovation, interdisciplinary action and the very logic of technological performance, which have much to share with artistic invention.

But also, under another profile, the problem of the arts is a dilemma posed at the very core of future society, such as contemporary technology is shaping it. Science and technics are advancing along development lines which are becoming the propelling factor in shaping new forms of external life, with physical toil giving way to growing automation, and men have more free time to squander or exploit advantageously, according to their individual bent. As alternatives to vacations, theatrical entertainments and mental sloth, they can turn to intellectual pursuits -- letters and the figurative arts -- in a persistent search for new sensations

and new creative activities, with each individual bringing his own personal experiences to them.

In their revived function as a source of human freedom, esthetics inevitably figure as a prime factor in utilizing free time creatively. But they must not be merely receptive; there are considerable formative benefits to be derived from cultivating the fine arts on a mass scale, especially in an era in which the arbitrary power of technology is growing. All the more urgent, then, is the esthetic predisposition of individuals at a moment when major alternatives are looming up weightily before us and priority decisions must be made.

The great phenomena of our era determine the extent and type of free time the common man can dedicate to literature, the figurative arts and his own spiritual elevation. In other words, he is at the mercy of productive technology and the kinds of organizations and social control it nurtures. Excluding the man in the street from their monopolistic command over decisions, these phenomena are engineering an evolution which, to a great extent, ignores the will of untold millions who should be guiding their own destinies by constitutional right. Perhaps some popular coordinated action could succeed in quashing certain intolerable actions; but research and its applications are little comprehensible to the masses, confounded by a maze of conflicting military, political and economic interests.

This unmanageable phenomenon eludes every communitarian determination. It poses a latent threat for the future, which elsewhere we have defined as the "autocratic solution," harboring a secret violence against artistic activity. Historians have left us graphic descriptions of many autocracies, some of them enduring for millennia, such as Egypt, others, like Rome and Byzantium, only a few centuries. Without exception, autocracy exploits the arts and letters to further its own aspirations, programs and leaders. Worse yet, sometimes autocracy is not content to act merely as exclusive client, but also seeks to impose its dogmatic criteria on the disposal of artistic output. Sometimes, as usually happens in modern autocracies striving to establish a dictatorship over their subjects' behavior and thought, totalitarianism not only dictates what themes are to be used but also what rules of style and taste must be obeyed which means entering at the creative level.

In the sinister forces evolving in contemporary civilization, the future would seem to hang over us with a leaden pall, diffusing a pervasive feeling of impotence afflicting most men. Yet, when the collapse of human discretion seems to deny the moral conscience any possibility of choice, an awareness of the alternative returns to take form dialectically in the exercise of futurological instruments. The more impressive and convincing these instruments are, the more they relate to art, together with -- and perhaps beyond -- their scientific vocation. If, as many maintain, futurology is an art because prefiguring the future demands gifts of imagination like those essential to artistic invention, then the very anticipation of a future scenario emancipating man's free will becomes an act of freedom from the present by affirming a discretionary power that restores the esthetic function to its most congenial sphere: a democratic society responsibly aware of its obligations. Even in this case, the prospect becomes complicated by the fundamental situations prevailing in present-day democracies, or presumed democracies. The future of the democratic regimes is closely bound to the maturation of their relations with the opposing autocratic systems and the emerging countries. Moreover, the organizational problems and life conditions arising from the new technologies provoke profound transformations likewise in the economic, social, institutional, political and cultural structures, modifying the very idea of the democratic model handed down to us in the long course of Western history. In a radically changing society, more complicated becomes the statute of a particular function -- its art which, too, is overwhelmed by its own and others' contradictions. But once again, we must see how the qualitative leap, which makes any forecast difficult if not risky, constitutes the authentic condition enabling us to make every evaluation and define our will. This is because the moment of decision discloses its own reasons and efficiency only through practising diversity. Utopia is more than licit; it is our duty.

The general impression is that in the long run, not only will we modify our present perception of the thorny problems assailing us, but also that many of them will disappear. Certainly, to take form and survive, the free-time societies must arrive beforehand at substantial solutions to the most pressing problems via the ample technical means at their disposal, supported by an assenting majority. Also, the most

urgent institutional problems must be at least launched on the way to solutions through participatory instruments that will make democracy at once more rigorous and more respectful of fundamental individual rights, which new mechanisms of public consultation will provide to promote the collective will.

Perhaps it is in individual life that things are most likely to change, relieving man's best energies from the constraints of the frenetic work pace imposed on him by the industrial revolution, and offering him far greater satisfaction in the liberal activities of a programmatically and subjectively creative life. Men living in the future free-time societies will not hew to specific daily obligations they have not assumed of their own volition from a vast selection of activities in civil, formative and leisure pursuits. Among these, literature and the arts will be the most congenial to the new cultural climate and the best suited to accompany those seeking to expand their inner resources along the ancient paths of curiosity and dreams towards unimagined horizons of the unknown, where light and dark will give substance to the imagination, like the mysterious shadows in the depths of the sea. Thus will emerge unforeseen concepts of life and the universe, ideologies and cosmogonies, in which voices of the past will echo like memories suspended between the real and the unreal, and images created by the imagination will give vigor and meaning to collective existence, propelling it constantly towards new spiritual and material goals.

Once we have eliminated all the dross blocking our way, even the common man will be able to read Plato, meditate on the ancient problems of the transience and permanence of life, and recall the titanic struggles men have waged for social advancement and freedom.

Nothing other than a different scenario is needed to counter that other scenario of oppression and moral disintegration. While the former seems to be coming upon us like an avalanche hurtling down from the lofty peaks of technological fatality, the latter scenario, also rooted in the same evolutive presuppositions -- of a value somehow made attainable through technological productive capacity -- must be purged of violence and the assault of interests which conspire to bind man in the yoke of its irresponsibility. While the first scenario could be passively contemplated, with however much horror and compassion, the second demands

the active participation of everyone if it is to be realized -- a work of art to be lived, not merely to be obeyed with humility, combining esthetic value with moral significance. Whoever practices art, the art of futurology, will confront those who weigh the results in their own minds and translate them into action. But then, that Utopia which enchanted us is no longer somewhere else, beyond our reach; it is here within the grasp of anyone who seeks to re-invent his life to make it a domestic masterwork.



SOCIETY  $\longleftrightarrow$  ENVIRONMENT.

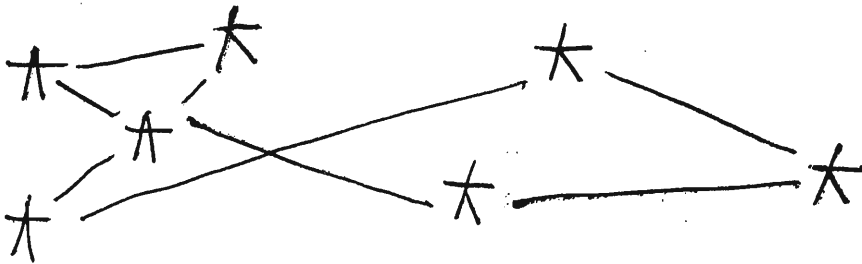
by Yona Friedman  
Architect

I. The Language.

I.I. Society can be mapped by a graph.

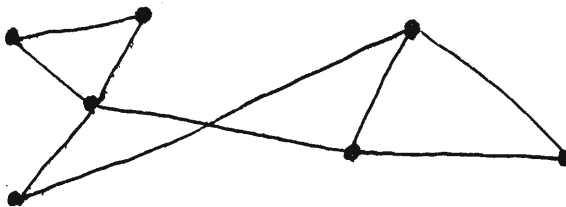
We call "society" a set of particulars in which set there exists a "relation" whatever between every particular belonging to the set. A particular person who has no such "relation" to at least another one who in turn is related to the others, can be considered as a person "out of society".

Let us suppose that I would like to sketch the image of a society. I will first draw all persons belonging to it, then continue by drawing lines linking any two persons between whom I observed an existing relation. I will represent thus this society through a figure, in which any particular person will be linked to any other by at least one "path" passing from one to the other by the intermediary of other persons.



If I replace the "mannikin" of this map of the "society" by points, the result will be a figure consisting of points and lines, in which there is at least one "path" between any pair of points chosen arbitrarily.

Mathematicians call such a figure a "connected graph".



Obviously enough, this graph gives an oversimplified image of a society. We cannot use this picture without some further explanations.

I will thus re-examine the concept of "relations" I represented by lines in the image. First thing, I will try to look who was drawing this image ? Otherwise stated, one has to know who is the observer of this society ?

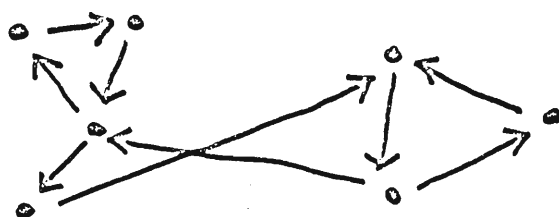
Let us remark immediately, that different observers will see different "maps" for the same society. In most cases I will not find easily two observers who would lend the same importance to the same relation : thus the "importance" of relations can not be observed with errors excluded, and therefore we will not introduce "importance" in our language.

On the other hand, simple existence of a direct relation between two particular persons belonging to a society can be observed. This means, that the existence or the non-existence of a "line" in a graph representing a society can be agreed by a large number of potential observers. We will thus content ourselves to mark the existence of a relation.

Another characteristic of such "relations" can be observed and marked : the "direction" of a relation. Let us explain the term.

Observing two persons who "communicate" (thus a relation exists between them) we can generally state that once the communication is finished, the one or the other (or both) of the two particular persons changes his previous behavior. We will say, in such a case, that one of the two persons (or both of them) received an "influence" from the other one. This influence "has a direction" an "arrow sense" which points from the person who exerts the influence to the other one who receives it.

We will call this "influence" a relation between two particulars which relation has an observable arrow-sense.



In conclusion, a society will be thus represented by a direct connected graph, i.e. by a figure consisting of points and lines, in which figure there is no such point without being linked by at least one path to any other point (when arrow-sense are not considered) and in which every line carries an arrow, representing the direction of the flux of influence in this particular link.

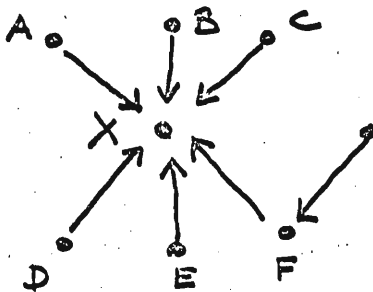
## I. 2. Structural characteristics of societies.

Our representation of a society makes it possible to describe its structural characteristics by using the "maps of society" we construct with graphs as explained above. These characteristics do not refer to any measurable size, as we had to exclude, before all, the possibility to observe importance, intensities, etc., of "influences" in general. We have thus to content ourselves by considering certain "topological" properties of these graphs, in order to characterize any social organisation whatsoever. These topological properties indicate characteristics implied by the linkage schemes, the paths and the circuits within such "maps" of a society : they correspond to those of the flux influences within a set of particulars linked among them.

In order to get to the description of such important characteristics we have to invoke an image : the image of the "situation" of a particular person within a society. This "social situation" will be defined by influences this particular person receives from and exerts upon the other member of the society. For exemple, if he exerts an "influence" upon 4 of his neighbours and he does not receive any "influence" from anybody, he could be considered having more "power" than another person who exerts as well 4 "influences", but receives at the same time 2 "influences" coming from others.

Thus "social situation" of a particular person will be expressed by the difference of the sum of influences starting with him and of the sum of influences having in him their end-point.

Practically, "social situation" of a particular person corresponds to his balance of influences. But - and this is important - we calculate this balance without associating any "size" difference to different "arrows", as we agreed that "size" of an influence is not observable.



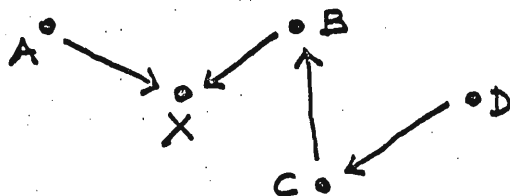
We will thus consider, applying an inevitable simplification, any "influence" exerted by one person to another one, as having the same importance when observed by somebody not related to any of these two particular persons (i.e. by an observer not belonging to the same society).

This convention does not mean, obviously, that the two persons linked by this influence do not associate a value, an importance whatever to this influence.

We can be sure that they do so, and, even very probably this importance will be different for the one and for the other of the two : the one who emits the influence might consider it as being important, and the other one who receives it, might ignore it ; or inversely, one might ignore the influence he exerts on others and the ones who receive it might appreciate its importance.

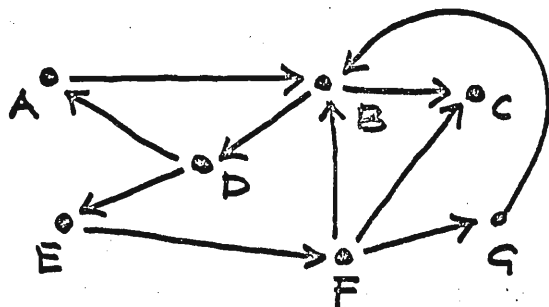
To avoid such equivocal judgment, we had to consider, as a "standard", the observation of an observer exterior to the society observed. But, if this observer considers all direct influences as equals, he might observe a degradation of "indirect" influences (influences transmitted by several intermediary persons), degradation suffered through errors, omissions etc., because successive transmissions (degradation resulting from what information theory calls "noise").

We will use, in order to describe this degradation of an indirect influence because of the transmissions necessary, a simple rule : we will suppose that the "intensity" of an influence will decay in inversed proportion to the number of intermediary transmissions necessary to its forwarding.



$$\begin{aligned} AX &= BX = CB = DC = 1 \\ CX &= DB = \frac{1}{2} \\ DX &= \frac{1}{3} \end{aligned}$$

We are now ready to define the "social situation" of any person within a society, situation observed by an observer exterior to this society. It will be expressed by the difference of the sum of all influences (direct and indirect) exerted by this particular person upon all other particular persons within the society, and of the sum of all influences starting from all particular persons in the society, and received by him.



$$S_x = \sum_{y=1}^{y=h} \frac{1}{d_{xy}} - \sum_{y=1}^{y=h} \frac{1}{d_{yx}}$$

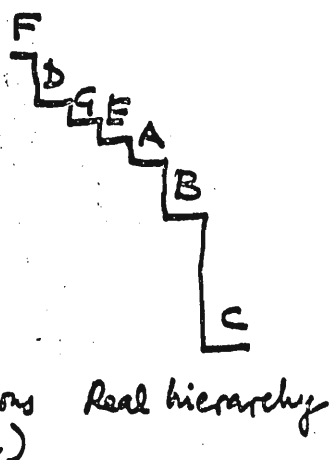
In order to do this simple calculation it is sufficient to construct the "path matrix", of the graph mapping the society in question. On the basis

of this graph (or of this matrix) we can obtain both sums necessary to circulate the parameter of "social situation".

A	B	C	D	E	F	G
0	1	2	2	3	4	5
2	0	1	1	2	3	4
0	0	0	0	0	0	0
1	2	3	0	1	2	3
4	2	2	3	0	1	2
3	1	1	2	3	0	1
3	1	2	2	3	4	0

A	B	C	D	E	F	G		
A	0	100	50	50	33	25	20	2,72
B	50	0	100	100	50	33	25	3,57
C	0	0	0	0	0	0	0	0,00
D	100	50	33	0	100	50	33	3,66
E	25	50	50	33	0	100	50	3,08
F	33	100	100	50	33	0	100	4,16
G	33	100	50	50	33	25	0	2,81
	2,41	4,00	3,13	2,83	2,23	2,33	2,73	

$S_A = 2,72 - 2 \cdot 1 = 0,72$   
 $S_B = 3,57 - 4,00 = -0,43$   
 $S_C = 0,00 - 3,03 = -3,03$   
 $S_D = 3,66 - 2,83 = 0,83$   
 $S_E = 3,08 - 2,50 = 0,58$   
 $S_F = 4,16 - 2,72 = 1,44$   
 $S_G = 2,81 - 2,72 = 0,09$



Path-matrix (d) → "Decay-matrix" ( $\frac{1}{d}$ )

Social situations ( $S_x$ )

Real hierarchy

Using this method, it is not only the "social situation" of any person within the society of our example (here containing 7 persons) that we obtained, but as well the real "hierarchy" established (frequently in a tacit way) within the society. Obviously, the hierarchy we find in the figure 7 (our example) is but the "hierarchy" observable by somebody exterior to this society. It is quite possible, that the "hierarchy" as observed by Mr. A. or by Mr. B. differs sensibly from the "objective hierarchy".

Let us suppose, now, that one member of this society decides to leave it for some reason of his own. Immediately, the "hierarchy" will be transformed as a consequence of this leaving it. Certain persons remaining within the society will benefit from this defection (their "social situation" will be improved), others will be prejudiced by the same defection. Thus, if we suppose - in order to keep the example simple - that all members of the society are interested to get a "higher" place in the hierarchy, those who benefit by the defection of Mr. X can be considered as his "adversaries" who are interested to expulse him from the society. On the contrary, those who are prejudiced by the exit of Mr. X. will try to keep him within: they are his "allies".

Using a simple function, which I call the one of the "dependance" of a particular person in the society upon the departure of Mr. X., we can construct a "table of alliances" characteristic to this society.

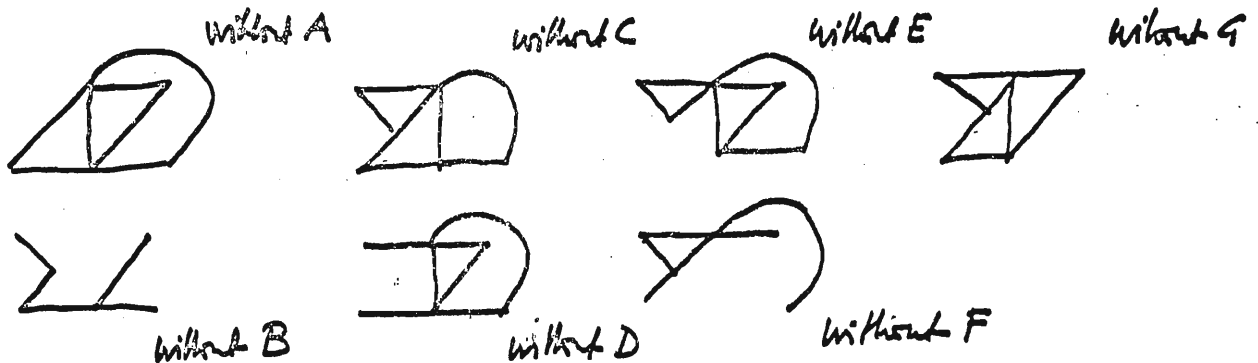
$$D_x(z) = S_x - S_x(y \neq z) = \left( \sum_{y=1}^{y \neq x} \frac{1}{d_{xy}} - \sum_{y=1}^{y \neq x} \frac{1}{d_{yx}} \right) - \left( \sum_{y=1}^{y \neq x} \frac{1}{d_{xy}} - \sum_{y=1}^{y \neq x} \frac{1}{d_{yx}} \text{ et } y \neq z \right)$$

Allies: those who want to keep Mr X within the group

Adversaries: those who want to push Mr X out of the group

Allies to X	X	Adversaries to X
FG	A	BCDE
F	B	ACDEG
ABEDFG	C	
BG	D	ACE
AE	E	CDEG
	F	ABCG
	G	ABCD

The "dependance" can be calculated in a simple way : by obtaining the difference between the "social situation" of a person belonging to a given society and his "social situation" after the departure of Mr. X. The first "social situation" can be calculated on the graph which maps the society in its whole (Mr. X. included), the second "social situation" will be obtained by calculating on a "subgraph" of the same graph, the "subgraph not containing Mr. X."

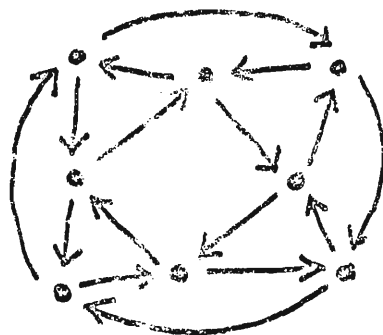


We obtained thus, by using a method sufficiently simple to be used by a child of 10 years, a fairly good description of the real structure of a society, and this method can be used in respect to any imaginable society.

### I. 3. "Egalitarian" and "hierarchic" society.

I will try to define, after all these preliminary explanations, two concepts about society, concepts which I consider is important : "egalitarian" society and "hierarchic" society

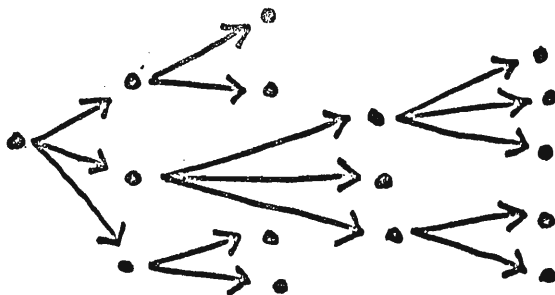
I call a society "egalitarian" if all members of this society have the same "social situation". Put otherwise, in an "egalitarian" society the difference of the totality of influences exerted and of the totality of influences received will be the same for everybody. Such a society does not contain thus any "upper class" influencing the others.



An "egalitarian" society is thus a possible one. There is a large number of graphs which satisfy this condition (even if certain other constraints restrict this number, constraints we will investigate later on).

Another type of society having a great importance because it is a very usual one, is "hierarchic" society : this type of society can be represented by a "tree". (a graph in which between any pair of points there is but one uni-

que path). This society is characterized by a "degressive" hierarchy of "social situation", starting from the "roof" (i.e. the person represented by the "roof" is the most powerful one, the persons next to the "roof" are somewhat less powerful, and so on). Its other characteristic is a "progressive" hierarchy of alliances, progression starting from the same "roof" (thus "dependance" i.e. change of the "social situation" suffered in case of the departure of somebody from the society will be less noticeable for persons at the "bottom" of the society than at its "top").



We saw before that this method of representing a society is based on the flux of influence within a set of particular persons. The two types of society we sketched above are practically two schemes of flux diametrically opposed: in "egalitarian" society these flux can start with any member of the society, it will arrive with certainty to all other members, perhaps slowly, but surely. On the other hand, in "hierarchic" society, there is but one person only who can start an influence which will arrive to all members of the society, and it will do so with a relatively high speed. As for the probability whether this influence will arrive to all, this probability is a very low one (because the non-cooperation of only one person somewhere in the society represents a blocus effective for a certain number of paths).

Obviously enough, these two types of society are not the only possible ones: I picked them out simply because they are particularly important ones. As a matter of fact, all our actual social utopias have as a goal an "egalitarian" society, and all our actual technical organizations are based on "hierarchic" society. Evidently, both are not existing as a 100% pure model., but there are many organizations tending toward the one or the other of these models.

#### I. 4. Society contains both persons and objects.

I would like to correct a simplification I had to make (among others) when I began this paper. I defined society as a "set of human persons who are linked among them by a system of influences". In reality, we are not relied to men a lone by a system of influences, but as well to objects .

I will be thus obliged to introduce a new definition for a society, as being a "set of persons and objects linked by a system of influences". Thus a society can be considered as a mixed mechanism containing men and objects.

In order to be more precise, I have to state what I consider as the criteria determining the difference between human beings and objects, from the-point of view of this study. This difference results from the fact that men are

worrying about their situation in society, as opposed to objects who do not care about it.

This definition makes possible for us to imagine other social alternatives, which could be realized more easily than most actual social utopias (even if these alternatives are as well submitted to the constraints we will talk about later). Such an alternative can be, among other ones, a society "egalitarian" for human beings but "hierarchical" for the objects belonging to it.

### I. 5. "Society" and "environment" are synonyms.

The first important result we got by applying our new "language" (the one of the definition of society and its mapping by graphs) will be the equivalence of "society" and "environment".

This equivalence is practically already contained in the definition "a set containing persons and objects". Indeed, the definition generally used for environment which is the following one: "the set of objects influenced and influencing men", is an insufficient one. Why not "objects and persons"? As for the definition of society, we investigated it in the preceding paragraph.

"Society" and "environment" mean thus the same set. It is this set I prefer to call, personally, the "others". This term is really the best fitting one, because it refers to the person who pronounces it. Thus, if Mr. X. is talking about society or about his environment, and he uses the term "the others" he includes Mr. Y., his house, etc., but will not include himself. On the other hand, if Mr. Y. uses the same term, he will include Mr. X., a tree, etc., and the whole system he is linked to, except himself.

The "others" are others for every one of us.

## II. The "critical group".

### II. I. "Valency" and "degradation of influence".

After this long chapter about "language" we are still far away from the results of this study. We have still to try to make clear certain basic concepts left, but, happily, we have most difficult ones behind us.

The first concept to be investigated is the one I call "valency": it signifies a property, observable and biologically determined, belonging to the human animal. This property defines how many centers of interest can occupy simultaneously the attention of man. For example, I can read two texts simultaneously (even if with some difficulties), perhaps even three but, surely, I could never understand ten different texts read at the same time. In this, case my valency will be perhaps three, perhaps more, but by no means as much as ten.

"Valency" will limit thus the number of persons who can influence (or who can be influenced) by one member of a society during a given period of reference. Valency will be visualized in the map of a society (or of an environment) by the "degree" of a given point corresponding to this person (we call "degree" the number of lines incident to a given point).

The second key concept, that <sup>of</sup> the "degradation of an influence by successive transmissions, we mentioned already, when we considered the way how to calculate real hierarchy ("social situation") within a society.

"Degradation of influences" through successive transmissions implies also an



observable and biologically determined property of the human animal : indeed this degradation depends on our mental capacity. I call it the "channel-capacity" of a particular person (or of a species) the capacity to transmit a message with a number of errors, where this number is characteristic to this "channel capacity" of this person (or species or sort of object).

This property is as well a very limitative one for a society : it implies that an indirect influence submitted to more intermediary transmissions than admitted by the "channel capacity" will decay completely : it will not arrive to any distinction "further" than a given number of transmissions.

"Valency" and "channel capacity" of the human animal represent two natural thresholds which can not be trespassed without great difficulties. These two thresholds effect the rythem of flux of influences among human beings (and objects), thus within social organizations (or environments) which finally are sensibly dependant on the numerical value of these thresholds.

## II. 2. The "critical group".

The possibility of practical application of these two thresholds (valency and channel-capacity) for societies or environments comes from the fact that these thresholds determine the numerical size (quantity) of "elements" (men and objects) belonging to a society without having a disturbing effect to its functioning. Implicitely, the same thresholds determine the number of links within a society. Thus, for example, it would be impossible to realize an "egalitarian" society containing  $n'$  humans,  $m'$  objects and  $w'$  links if the respective thresholds do not admit more than  $n'$  humans,  $m'$  objects and  $w'$  links, and when  $n$ ,  $m$ , and  $w$  are respectively smaller than  $n'$ ,  $m'$ , and  $w'$ .

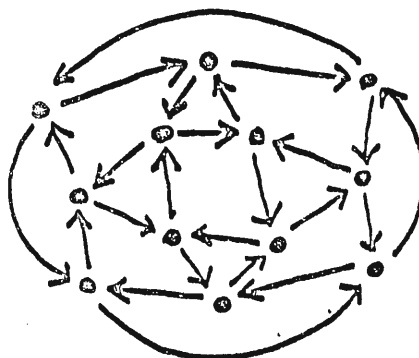
It would be exactly as impossible to conceive a "hierarchical" society containing  $n''$  humans,  $m''$  objects and  $w''$  links if the specific thresholds imply numbers less for both "elements" and "links" for a "hierarchical" society. Expressed in a simple way, a society or an environment, having a determined structure (in the sense used in the first chapter) cannot contain more elements and links than admitted by certain established threshold numbers.

We will call "critical groups" the largest set of elements (humans, objects and links) for which the functioning of a group, characterized by a determined structure, still can be assured.

Example:

valency  $V = 4$   
 channel capacity  $C = 4$   
 structure "egalitarian"

in this case the "critical group" contains  $n = 12$  persons



The concept of the "critical group" is perhaps the most important result of this study, because a comparison of any organization with the "critical group" corresponding to its structural category shows immediately if this

organization is a realizable one or not. Most social utopias or projects do not succeed less because of an impossibility to implement the ideas on which they are based, but simply because of its size being larger than the one admitted by the "critical group". Very often it is exactly the success of a groups ideology is the tool of its self destruction, as this success involves the group's expansion and when expansion passes the critical groupsize, the group "explodes".

### II. 3. "Critical groupsize" a characteristic of a species.

"Critical group" is a result of two biological factors ("valency" and "channel capacity") and one topological factor (the "structure" of a society). Its size is thus independent of any ideology, technic or knowledge, otherwise expressed, of any "artificial" factor invented by man. The three decisive factors depend thus on "natural laws" and the rule of the "critical group" is itself a "natural law".

Two of these factors ("valency" and "channel capacity") are biological factors : thus they differ with every species. The third factor is invariant, in the sense that it is the same for any species.

Thus, "critical groupsize" varies with every species : it is different for men, for monkeys, lions, herrings or bees . But, for any species, it can be known, and the numerical size of the "critical group" could be considered as a characteristic of a species.

If we consider, for example, an animal species, let us say, for example, elephants ; we will find that a herd of elephants varies as to the number of individuals belonging to it, but this herd never exceeds a given number : that of the "critical groupsize" of elephants .

Alienation of man could be thus a consequence of exceeding enormously human "critical groupsize" : we cohabit with more people than we can tolerate, and with more objects than we can rely on, and all this without our selves becoming biologically a different species.

Exceeding "critical groupsize" provokes an overload on the brain of an individual, overload which he cannot bear.

### III. The "critical group" characteristic for the environment.

#### III. 1. The overproduction of "rubbish".

Statements concerning the "critical group" for living beings (men and animals) have their analogues concerning objects, but I will reserve my interest before all for reality, which contains both living beings and objects, as a whole.

We said already that environment means the "others". We are not necessarily in contact with all "others", living beings or objects, thus it is more true to reserve the expression "the others" for those only with whom we are linked in an observable manner.

"Environmental crisis" results from the fact that our manner of observation has improved : there are today many relations known which were before non-observable. Many other relations, which could be observable, were not observed because they did not retain our attention .

One of such relations, a very important one, concerns production of "rubbish". Any living organism, or any organization containing living beings, function through selection of components useful for its survival. The proposition of useful components related to all components contained in an environment is a very small one, thus the organisms or organizations mentioned reject a quantity of components which is far superior to the quantity retained. A living being is thus a "rubbish factory".

If "rubbish" is "recyclable", it is not in any amount. If "rubbish" is produced in an amount bigger than a determinable threshold, "pollution" (accumulation of rubbish/h) begins. It is a question of a "critical amount" of rubbish, this amount being determined by the "structure" of the organism or organization which effectuates the selection of useful components and thus produces "rubbish", and by its relation to "other" organisms or organizations.

The key of "overproduction" of rubbish" is thus the operation of selecting what is useful. Today, with our actual way of practicing selection, the principal production of humanity is "rubbish" : about 70% of human energy is invested in it.

#### III. 2. "Rubbish is beautiful" or adaption to make rubbish useful.

As the preceding paragraph points out rubbish is rubbish because it was considered useless during the operation of selection, very often because of arbitrary reasons. We could reduce overproduction of rubbish by a simple method : by changing the use criteria for certain objects, thus changing the very operation itself : selection

To explain this idea, I would refer to a "historical" (or even "prehistorical" example. I think about the "heroic" period of the agricultural revolution.

First act for the farmer was to cut down and tear out native vegetation from the land he wanted to sow, then, from season to season he threw away stones and rocks that he found on his land. The product of this deforestation and of this disposal of stones was a genuine "rubbish" to the farmer : wood and stones. One of the first inventions of the primitive farmer was the "recycling" of this "rubbish" in the form of using it to construct his shelters, his house.

This recycling did not imply any transformation of the material of this rubbish, even no intervention of some new technology ; it did consist only of a change of attitude of man in face of some "rubbish" which began to accumulate in quantities over the "critical amount".

Prehistoric man avoided thus one case of pollution through nothing more complicated than changing his own attitude.

Let us imagine, as a second example, a similar change of attitude for today : I planned several years ago to propose an international competition under the title "rubbish is beautiful". The basic idea was inspired by the fact that a big part of actual artistic movements use rubbish for artworks. Thus, why not try to transfer heaps of rubbish into monumental artworks, some monuments of our time ? A large part of rubbish is not biodestructible, and it asks for big efforts to dispose of it, out of the circuit of everyday life. Why should we dispose of it ? Why should we not use it for the construction of "megasculptures", collective ones if possible ? let us imagine, for example, a pyramide of plastic bottles, or a large sculpture made of wrecked cars.

The conclusion would be that being faced with pollution (i.e. we exceed the "critical amount" of rubbish) it would be easier to change our attitude towards rubbish than avoid this exedent.

Expressed otherwise, "critical amount" of useless components is characteristic of a "species of objects" (exactly as "critical group" was for a living species), and of the organization men impose on these objects. It is then easier to change this organization than the characteristics of the species, once rubbish exceeds the "critical amount".

### III. 3. "Critical group" for production.

Let us try to correlate the two manifestations of thresholds :

1) the "critical group" of a living species depends on the "valency" and "channel capacity" of this species, and of the structure of organization in the group ("structure" in its topological meaning) :

2) the "critical amount" of rubbish depends on the human group organization; of its attitude towards rubbish, and of the properties of the transformation process (selection of useful components) producing an objectif.

If we stated that all factors of the "critical group" are independent from human will, factors of the "critical amount" concerning objects is largely dependent on human desires.

It is interesting to remark that the "critical amount" of rubbish is partly a function of the "critical group" of the human species, and partly of the transformation process producing a specific object.

This remark opens the question whether a return towards social groups including less members than the "critical group" would not resolve as well pollution problems, at least in a large number of cases ? Would such a return to social groups smaller than the "critical group" not reduce as well communication between groups, thus both commerce (the most ancient type of communication) and overproduction (production of goods for other use than one's own) ?

I do not think to be able to answer these questions actually, the only answer I can give is that these questions seem to me very important ones. But

one thing I am sure of : a return to groups smaller than the "critical" one would resolve a great only of our actual economic problems : relations between production, property and (exchange. (I developed these ideas more in detail in my about Realizable Utopias.

In the following chapters I will try to expose some social organizations, and to analyse them according to the points of view we considered in the first three chapters.

#### IV. The realizable utopias.

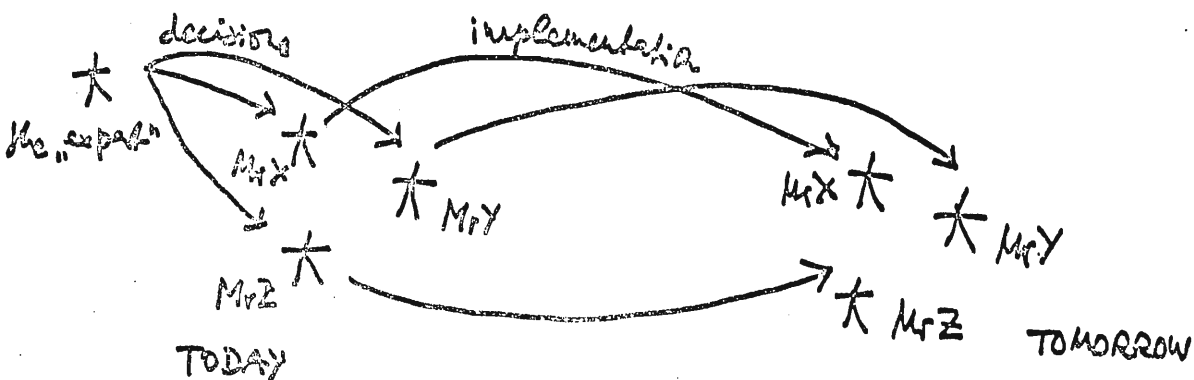
##### IV. I. The "non-paternalist" scheme.

We did investigate till this chapter the "objective" elements of this study : definitions, a language based on graphs (thus on mathematical beings), the "critical groups" (concept belonging both to biology and to mathematics) characteristic for man and environment. We did not do any moral judgment in this part, and even all examples were mentioned only as illustration, without committing my self by saying if I consider these examples desirable or not.

Now I will change my attitude, and I will talk about schemes and organizations and state my opinion about them. Thus I plan to make moral judgments, and I will use, for that as well, statements from the three preceding chapters, as reference, to be as precise as I can be in this condensed study.

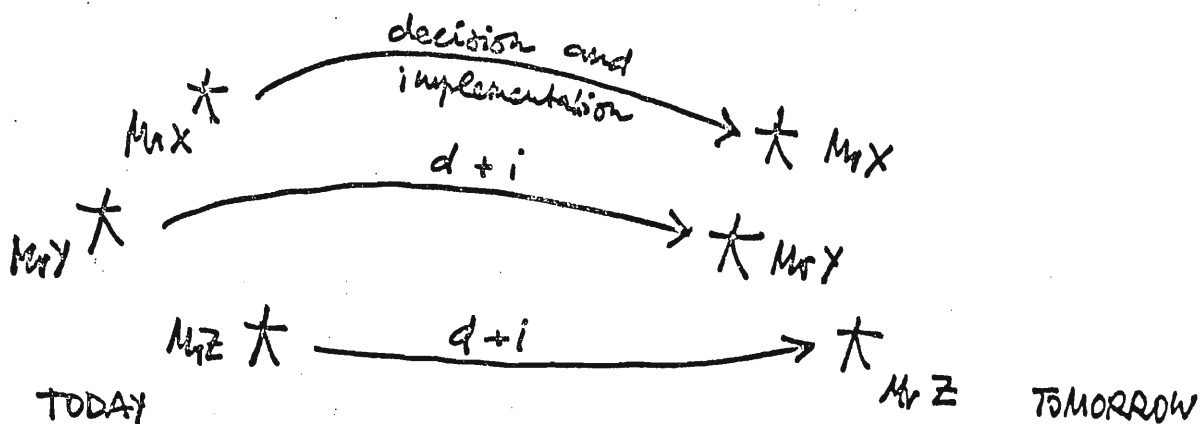
I will start by explaining what I call "paternalist" and "non-paternalist" schemes.

I call "paternalist" any organization in which one or more person makes decisions, which decisions are supposed to be implemented by other persons who have to take all risks potentially implied by the decisions, without the persons who made the decisions taking any risks themselves. Obviously enough, I don't want to suggest that the decision makers, who made their decisions at the expense of "others", did so by bad intentions. In this category of organizations belongs all acts of "experts" : people who pretend to know better, what to do for the wellbeing of others, than these "others" themselves.



I call an organization "non-paternalist", any organization in which all decisions are made such persons who implement these decisions themselves

and who take the whole risk potentially implied by the decisions, and where there exist no "others" who risk to get the "fallout" of the decisions.

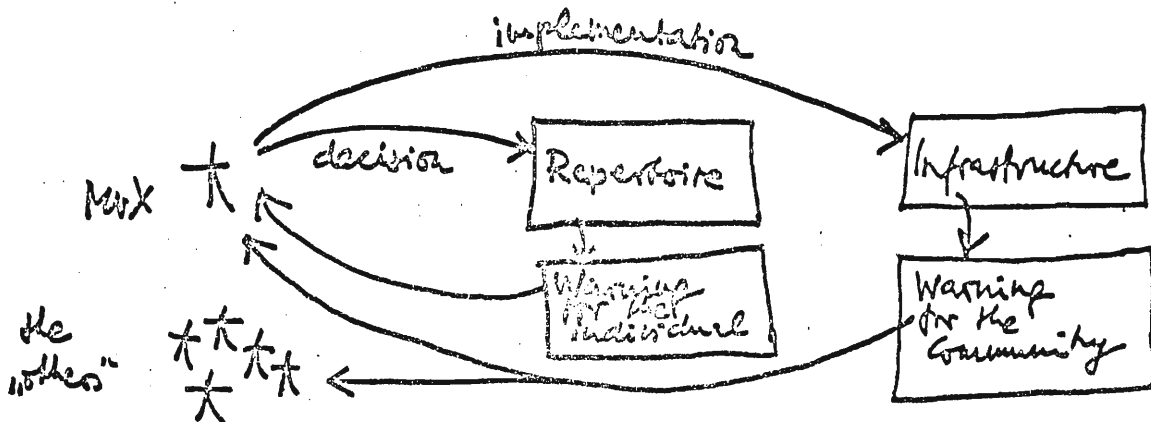


I personally consider that the "non-paternalist" scheme is desirable, and that the "paternalist" scheme is dangerous, inefficient and unjust. My judgment about it being dangerous and inefficient is an "objective" judgment (i.e. can be explained in general terms comprehensible to anybody), but my judgment about its injustice is a moral judgment.

IV. 2. "Objective language" is a condition "sine qua non" for "non-paternalist" schemes.

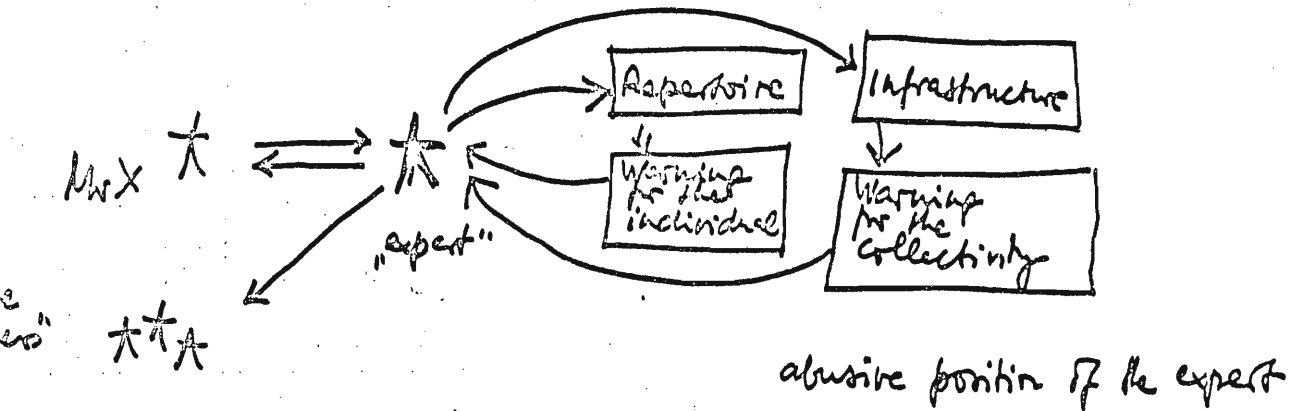
The "non-paternalist" scheme is not realizable only if any particular person involved in a processus, going on following such a scheme is informed about the following points :

- 1) What are the possible alternatives among which he can effectuate his choice of a decision ("repertoire") ;
- 2) What are the consequences for him personally; which he can expect from his particular decision ("warning about consequences to the particular") ;
- 3) What are the particular rules in the context wherein he will implement his decision ("infrastructure") ;
- 4) What will be the consequences of his particular decision for the "others" (warning about consequences to the collectivity").



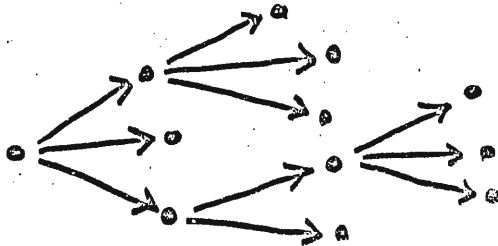
Conditions necessary for such information cannot be assured except if an "objective language", a "code" is used. (Thus, the first chapter of this study about language is the guaranty that this study is a "non-paternalist" one).

Reasons of this condition result from the fact that without an "objective language" neither the "repertoire" or the "warnings" or the "infrastructure" can be described without imprecision ; and genuine decision cannot be made without knowing these elements. If a particular person does not know them, he can be abused by some "expert" who tries to impose upon him his (the expert's) decisions : for someone not knowing such a "language" the expert will become a self-appointed "translator" who might use the "others" ignorance about "objective language".

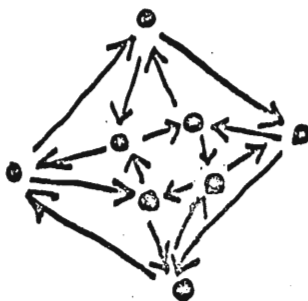


Following the "objective language" we examined in the first chapter, "repertory" of social organizations (obviously oversimplified) will be the following one :

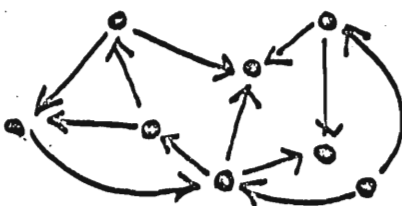
- a) "hierarchical" society, represented by a "tree" (a graph in which between any two points there is but only one path.



- b) "egalitarian" society, represented by a "strongly" connected well oriented "graph" (a graph in which between any pair of points there are several paths and in which arrow senses are ordered thus that any mesh represents a closed circuit, without arrow senses in one circuit being contrary to those of the other circuits).



c) "indetermined" society, represented by a connected directed graph without supplementary conditions.



Consequences implied by the effective choice of one organization, neither these consequences concern the particular or the collectivity, can be foreseen by the simple formulas we talked about in the chapter on "social" situation": warnings will thus describe both hierarchies and alliances within a particular social organization.

Evidently, hypothesis in the first chapters involve that the language describes indifferently a society or an environment.

Thus we are prepared to implement "non-paternalist" schemes.

#### IV. 3. Some realizable examples of "egalitarian society".

Personally, and because of moral reasons, I am for the "egalitarian society", and I would reserve this paragraph to its realizability. I would like to enumerate some examples derived by it, and which examples can be realized following the "non-paternalist" way.

##### a) The "non-competition society".

We are often victims of a superstition which interprets competition as an imperative of the survival instinct. Competition might be a means to assure survival of the fittest if it concerns a drive which has to be satisfied by commodities which are scarce (like, for example, food in an arid region).

Once all means for survival (food, water, air, shelter, disponible area, etc).



are abundant (naturally or artificially), competition for survival is no longer necessary. We (humans) invented then a "fictive scarcity" a "privilege" (material or immaterial) which cannot be assured but in limited quantities. Such a privilege (scarce by definition) will then be the "premium" inciting to competition. All our actual societies are based on an internal struggle for privileges (luxury, status, etc...) which are not directly necessary for survival.

Let us imagine a society which would resign from these privileges. It would be, by essence, "egalitarian" and it could not be realized, except if the number of its elements (persons and objects) does not exceed the limit imposed by the "critical groupe".

b) The "anonymous" society.

We all like to "countersign" things we make : shoes, artworks, omelet or poems. It is true that a shoe, an artwork, an omelet or a poem makes me happier if I know who made it ?

The relation persons-objects is organized in two path-sections :

- 1) from the producer to the object (or idea) produced.
- 2) from the object (or idea) to the user.

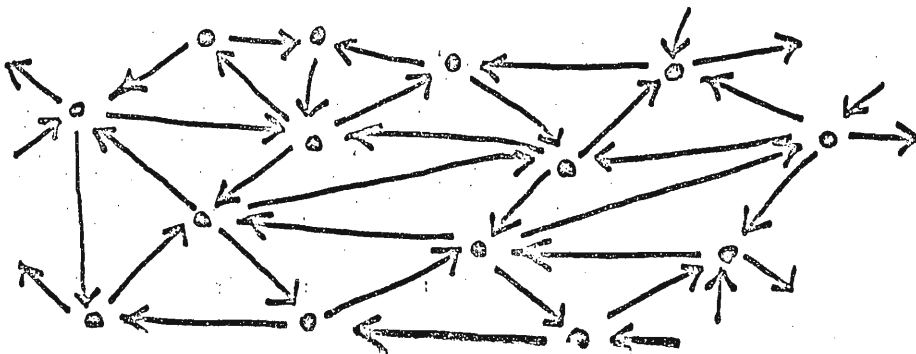
Between these two "path-sections" I consider the second one as important. If the section "producer-object" has but a reduced importance, this involves that it is not important to know who made a thing ; the important thing is to know for whom it was made.

An "anonymous society", in which anybody knows how to make things which will be considered important, is necessarily an "egalitarian" society, based on "non-paternalist" organization : such a society is an "anti-elitist" one.

c) Society with "weak communication".

When we investigated the idea of "critical group", we saw that decisive factors were "valency" and "channel capacity". "Critical group" was thus relatively small group with a very reduced amount of communication, as most communications could not arrive to persons situated far from the source (distance measured by the number of transmissions necessary to dispatch influence).

We considered "critical group" as an "island" isolated by a zone of non-communication surrounding it. But, conditions of the "critical group" could be interpreted as well otherwise : in a communication network containing a number of persons and objects can exist a "critical group" around each particular person (or object) in the society, considered as the "center" of this group. Such an interpretation is possible if the "links" composing the network are arranged in a way that the number of links relating a particular person to the others does not exceed the number admitted by "valency".



This society, even if containing a very large number of particulars, contains a relatively small number of links : it is based on "weak communication".

#### IV. 4. India shows perhaps the alternative model for western-type society.

I find it a rather interesting fact that the only place where I met an observable example of all three types of "egalitarian" society, was India. If "non-competition" society, "anonymous" society and the society of "weak communication" exist separately in western-type countries, in India only did it seem to me to observe all three together.

Indian society is composed of very small groups (smaller than "critical group"). These groups are not linked very tightly between them because local communication because of technological inefficiency (and for its good luck).

Indian artisans consider, from many centuries ago, that it is not desirable to countersign their work : these works could be produced by anybody else/. The thing considered as important with a work (or product) is the way the future user will utilize it, and this way ("code") is strictly indicated.

Society of "non-competition" does exist in India but in an incomplete form as abundance, which would be necessary to its complete development, is lacking. Even so, relatively to the poverty of the country, "non-competition" characterizes much the basic attitude of people : it is appreciated, contrary to our countries where competition is admired as a positive, desirable feature.

It is not uninteresting to remark that industrial development in India (a development which is considerably more than many people would think) is going on less by large industrial concentration, than (always for technological reasons) by artisanal decentralization : artisans (workers) work at home for industrial organizations and they complete often by their particular inventiveness what they lack in tools.

I know that I cannot avoid being superficial and partial by the picture I sketched above. My intention here is less to discuss India's policy than to visualize, by facts I observed in the country, the theoretic concepts stated before, and this knowing that these facts might develop in an unforeseeable way and the reasoning behind them is more complex, conditioned by a long history. Even so, I became fascinated to find in this very rational country (the only one among developing countries where a military dictatorship did not exist till now), there exists a model from which we could, perhaps, learn something.

#### IV. 5. An industrial "ecosystem".

The idea to relate the "critical group" of society to that of production (concepts linked by a similarity of thresholds), led us to society of "weak communications", social and artisanal, and we mentioned this idea in reference to India.

This idea could lead us even further towards a "social and industrial ecosystem", which could be successful provided that links are "weak" within the system. This system could be thus represented by a "map" in which "valency" and "channel capacity" would have very low numerical values

We studied already in the preceding paragraphs "social ecosystem" (even without pronouncing this expression). Let us look now very swiftly at "industrial ecosystem".

It would concern, to give it a visual image, of a "co-existence" of small scale industrial organizations (smaller than "critical group"). These organizations would function in such a way that "rubbish" produced by one would represent at the same time the raw material for the other one (similarly to the example relating to materials rejected by farmers becoming raw material for the madons).

"Rubbish" of occidental industrial production could represent today, for example, a very important source of "raw material" for developing countries. Plastic bottles, food cans, cardboard wrappings, even the paper of newspapers are materials very intelligently used in India, or in other countries of an equal stage of development. Indians transform these materials into objects of beauty or of everyday use, objects which very often are looked for on the Western market !

An "exchange of rubbish" could be potentially more important than the "exchange of finished products going on today. Such an exchange could appeal to any particular inventiveness occurring in the different small groups (smaller than "critical group") and, on the other hand, it could avoid accumulation of "industrial rubbish" over the "critical amount".

It seems to me quite probable that a "social and industrial ecosystem" having but "weak internal communication" could resolve most of our social, economic and political problems.

#### V. Technological utopias have but a very limited effect .

I referred in this study mostly to social (or environmental) utopias. Why did I omit voluntarily technological ones ?

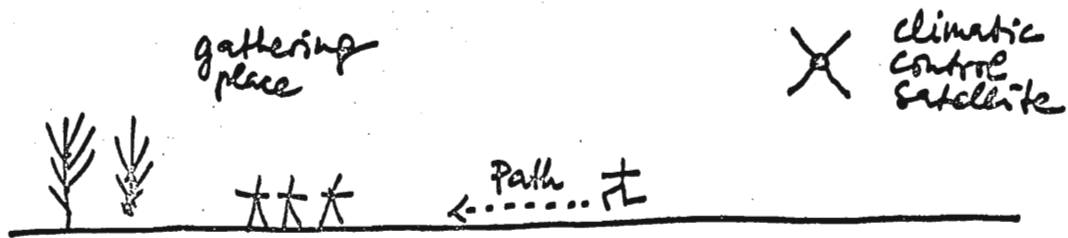
I would present here an example which could show how small the direct impact of a technological utopia, even of a very advanced nature, could be. Let us suppose, for the example only, that we have the possibility to forecast effective implementation of some technical inventions (inventions which in reality are not yet out of laboratories). I choose here three inventions which could have a very large effect :

- a) advanced control on weather
- b) large increase of basic food
- c) transport of energy with no conducting lines.

These three inventions could be realized in several ways :

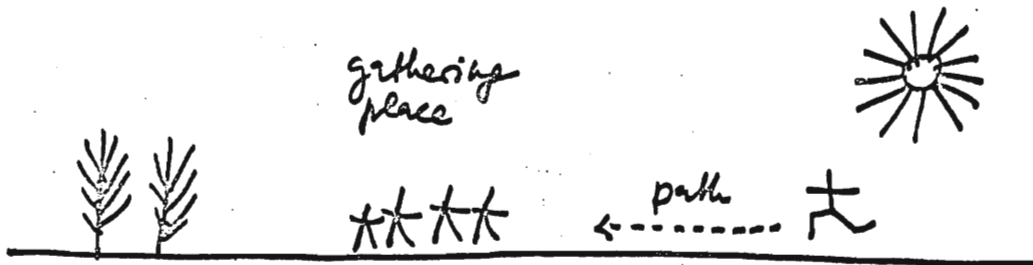
- 1) by hardware ("things" used by man) : (satellite-relais for weather control, "green revolution" for basic food, energy beams for energy transport, etc).
- 2) by software (mutation of man himself : better weather resistance of the human body, better efficiency of human metabolism, etc...).

What would become Earth's landscape if these inventions could be implemented?



It would become (it is indifferent whether hard or soft technique will be implemented) are real paradise : no buildings (as weather-shelters are no longer necessary), no towns, practically no factories, etc. The only man-made objects visible on the landscape would be assembly areas (where people gather if their personal presence is necessary) and paths or roads leading to these areas.

Let us think. This idyllic utopia is not new : it was already existing in prehistoric times : the only man made objects were gathering areas of people and paths which lead there.



The two pictures are identical ones. The most developed technology we can imagine leads us to prehistory.

If our species changed from prehistory till today, this might be less the consequence of technology invented than of transformations of human social organization.

I did not intend to use this example as a proof, only to visualize the primordial importance of relations among individuals which I consider prior to technological inventions.

## VI. Conclusion.

This short study led us to very important results : to find possibilities of realization of our social or environmental utopias.

My first conclusion concerned the fact that "society" and "environment" mean the same thing : a set of persons and objects around us. This equivalence of

"society" and "environment" signifies, logically, that "structural laws" valid for the one is valid as well for the other. These laws are characterized by "threshold conditions", which statement means that both "society" and "environment" function differently under and over certain strictly definable dimensions : I called these "thresholds" the "critical group" (for society) and "critical amount" (for objects in the environment).

If "structural laws" are the same for both "society" and "environment" my "moral" attitude - conditioned by the fact that we are men and not objects - is a different one towards "society" than towards "environment". As a matter of fact, I find admissible a "paternalist" attitude towards objects and I consider the same attitude inadmissible towards humans. I demand a non-"paternalist" attitude towards men, which attitude means that nobody has the right to make decisions for other people, who might suffer from this decision, instead of the person making the decision taking the risk of suffering himself.

These two conclusions, one "structural" and the other "moral" are not independent from each other : it is the "structural" law which determines what consequences (risks) can be expected from decisions we make whether concerning "society" or "environment".

For moral reasons, the most desirable society seems to be, in my opinion, the one I called "egalitarian" society. This type of society is considered as utopic as it was not too often realized. Our new knowledge about "critical group" shows the reasons for apparent unrealizability of this type of society, which results from the fact that nearly every tentative to install such a society depassed limits imposed by the "critical group".

We cannot improve the actual situation (social and environmental) by technological progress alone. Such a progress, at best, does not but lead us back to some situation which existed before and which could be implemented as well without technological progress.

We could not improve our society and our environment except under the condition that all improvement should be decided by any one of us. This type of decision making is implied by "non-paternalist" scheme which we investigated before. The way leading to such improvement could be indicated through a "social and economical ecosystem with weak communication".

"Critical group", this fundamental condition of survival, is a characteristic of our species. Our future could depend on our answer to the question : can we get back" to groups satisfying the criteria of "critical group", or are we undergoing a "mutation" (in the biological sense) into another species characterized by a different "critical group".

French original text  
dated :  
Paris, January 1972.

*J. F. Fiesche*

## ESTHETICS AND PERSPECTIVE

By Roger Garaudy  
 Philosopher;  
 Professor of Art Forecasting

For the first time since the Renaissance, we are confronting the problem concerning the very aims of life, our society and our common history.

The youth riots of 1968 in countries all over the world marked the moment when a basic, albeit new, need emerged: the creation of a new project for civilization.

With the dreams of Descartes and Faust ended in failure, what was felt with an uncommon impact was the need to conceive and to live:

new relationships between man and nature, which are not only technical and proprietary but also esthetic; not only relationships of conquest but also of love, to attain a harmonious balance between man and his environment. For the past five centuries in Europe the overlords have been saying "the land belongs to us". But another deeper reality still persists: "we belong to the land". Every Japanese and Chinese Sung print makes us sense this truth profoundly.

new relationships with knowledge, not only logical but also esthetic, not only conceptual, analytical and external but immediate, participatory knowledge. African dance and music and their transfigurations in America as well as the "not knowing" of Taos and Zen or the practice of yoga make us feel the need for it, the need to experiment the plenitude, but on the condition that we do not forget that critical "detachment" which is Europe's own contribution: "Whatever I say about God, it is a man who says it".

new relationships between man and man which can no longer begin with individualism only to end in totalitarianism and remain always "one dimensional", but rather true community relationships, establishing not only an organic, living bond between the individual

and the group but also allowing each one that social elbow room enabling him to make a human being of himself, a person who answers the questions proposed to him by the community, rather than aping the behaviour models imposed upon him by group pressure.

- new relationships linking work, art and faith, which do not separate them in a moral partitioning but realise in the unity of life man's fundamental act, which is the act of creation, the continuing creation of man by man, in an activity which is indivisibly work, art and faith.

The answer to such a problem can only be planetary.

The West can no longer nurture the illusion that it is the only centre of historical initiative, the only arbiter of values.

The future of everyone can only be the work of everyone.

Thus a new reflexion on the aims of our lives and history is only possible if we break away from the perspectives of the Renaissance, that is, from the birth of capitalism and colonialism, which have denied, when they have not destroyed, the other civilisations and other cultures for the profit of their own technicism and their narrow utilitarian concept of reason, capable of giving increasingly powerful means to societies but lacking any really human goals.

Painters were often the pioneers of this futures invention; they first to suspect that "European humanism" was becoming more and more provincial and that, to reach for new goals, each man must be steeped in the entire epic and the continuing creation of man by man. Not only by the historically departed past but by the many pregnant possibilities which all too often miscarried.

Thus it was that Delacroix found the Muslim man in Morocco, that the impressionists and later van Gogh discovered Japan, Matisse and Klee Islam, the German expressionists and the cubists the sculpture of Africa and Oceania, abstract painters

Chinese calligraphy and the great American Indian myths.

"A painter's greatness", wrote Juan Gris, "depends upon the past he carries inside him", which is true of every creator. But this past is neither arbitrary nor fatal. It is born of a multiplicity of possible human projects, some of which have successfully taken root while others no less rich in humanity, have aborted.

To help us grasp this concept of man's unity, continuously being born and continuously growing in his past as well as in his future, an authentic "dialogue of civilisations" would serve towards verifying the following work hypotheses:

1. EVERY CULTURAL EXPLOSION IS PRECEDED BY AN EXPLOSION, that is by a convergence of multiple cultural contributions at a privileged point. Thus it is that the "Greek miracle" which drew its sources from Egypt, India, Persia and the whole Mediterranean basin, can be demythicised; like the European Renaissance which would be unintelligible without the benefits made to it by Arab expansion, the Mongolian invasions that brought Chinese culture with them, without the rediscovery not only of Greece and Rome but of Persia as well and, later, of the American Indian civilisations.

2. THE CONTINGENCY OF THE HEGEMONIES. One of the great misfortunes of recorded history is that it was written by conquerors who have invariably sought to prove that their hegemony was a historical necessity which necessarily derived from the superiority of their culture and civilisation. Sometimes this was true, but most often a hegemony's technical and military superiority did not of itself imply any superior culture, a human project imposed by the victors on the vanquished. Thus, for example, the prodigious cavalcades and conquests won by empires of the steppes were the triumph of horsemen over foot soldiers or the iron sword over the



bronze sword. Such were the Roman subjugation of Greece, which was a victory of military organization or simply of organization, and the victories of the Portuguese and Spanish, when they annihilated ancient American civilisations only by their brutality and murderous firearms.

3. A TOTAL HISTORY CAN ONLY BE A HISTORY OF HUMAN POSSIBILITIES:

The search for and re-conquest of those dimensions lost by man because of opportunities lost in history. From this point of view, the importance of the human project conceived or lived in this or that epoch and of the role it continues to play in our own life today; to cite an example, Akhenaten's hymn to the sun is infinitely more precious than all Rameses' battles put together. Akhenaten's reform is typically one of these aborted human possibilities in the search for man's unity. The important thing; therefore, is to emphasise that in every epoch of history many possibilities were open but only one was realised. In a word, we can only defatalise the future if we defatalise history.

Each one of man's great works, from the simple utensil to the moral code, from the plan for urbanism to the work of art or the religious creed, is never the mere reflexion of a reality but rather the model or project of a reality to be transformed or created, of an order which does not yet exist, an anticipation of the future. To read history from a non-positivistic viewpoint i.e. history without man, is to decipher this human project crystallised in a work of man. This brings us to the fourth principle:

4. A MISCARRIED PROJECT OF CIVILISATION CAN HAVE LEFT ITS

TRACES in a religious sect, in a utopia, in a revolt, in an art work with no immediate posterity, therefore crystallising within itself a whole project of civilisation.

To know how to read history - not as a series of one-dimensional facts united by an inexorable destiny but, conversely, as an infinity of teeming, burgeoning possibilities always witnessing

man's poetic emergence and his prophetic efforts of creation -- means asking questions of this sort: what would a civilisation have been had it been inspired in all its aspects (economic, political, religious etc.) by the spirit crystallised only in a work of art or in a utopia with no immediate future? From this viewpoint, for example, the surrealist world of Paolo Uccello, who exerted no notable influence on his contemporaries, can bring us a human enrichment at least as great as that supreme historical lineage which, from Piero della Francesca to Leonardo da Vinci, modelled our civilisation for several centuries. Again from this point of view, Joachim de Flore's still-born utopia, revived only sporadically in the revolts fomented by Jan Huss and Thomas Munzer and likewise snuffed out, can illuminate in us a life more intense than St. Thomas Aquinas' triumphant work which in the course of centuries structured a Church and a civilisation.

This is a question of discovering in each work that deepest centre in man where knowledge and poetry combine to make only one act: the continuing act of creating, of man by man, resolutely orientated toward inventing the future.

A veritable dialogue of civilisations is only possible if I consider the other man and the other culture as part of myself, dwelling within me and revealing what I lack. Thanks to him, lost dimensions are reborn in me, as well as emotions I had thought forever engulfed, beauties and marvels I had believed forgotten.

Through him I discover in a single stroke what I lack and what is possible. A burgeoning of possible worlds. Beyond the real, the surreal. This is one of the primary conditions of our entry into the future. Because we must not discover the future; we must invent it.

History -- that is, both the history in the making through our actions and the history already made and pondered by the historians --, is not only a reality already existing which we merely need to merely analyse, but the sketch of a poem we must create.

Constructing that poem demands a veritable dialogue of civilisations to recover all man's lost dimensions, all history's lost opportunities. The answer to such a demand -- to pursue man's continuing creation by man through these new relationships between man and nature, knowledge, society and his future -- requires us to achieve a new founding act; a new creator act, to learn the calling of God.

"How does one learn the calling of God?" Jean <sup>Rostand</sup>~~Rest~~ asked. We reply readily: through esthetics, that is first by a reflexion on man's creative act.

Great art has always been prospective, if not prophetic.

In Homer's Iliad, Hector at first lived a quality of life which the Greek moralists centuries later abstractly defined as "virtuous", virtues which subsequently became rules and regulations. Van Eyck invested his painting with a world vision; in which the broadest scene and the smallest detail are equally present and discernible, as if under the scrutiny of a god; it is a religious experience of life which preceded the Christian mystique by more than a century, and a scientific expression which was only to be fully formulated by Leibniz in his infinitesimal calculus. Piero della Francesca painted Renaissance palaces before they were built in stone, and Picasso's "Guernica" launched a new pictorial language which can express "total war" and its "counter nature" that no massacre depicted by Goya or Delacroix can recreate, because "Guernica" is an announcement of Auschwitz and Hiroshima.

We could give a thousand examples of ideas art has brought to life which were subsequently to crystallise in a system.

Two philosophers, Vico and Fichte, dared to violate deliberately the false claims asserted by Plato, Descartes, Spinoza, and Hegel that they could enter into man's being and tell what he is.

Vico put "poetic wisdom" at the sprouting point; thus showing that the imaginary is the source of knowledge, that knowledge begins with an act of creation; with a poetic act; by an affirmation of the

self, that the act of artistic creation "vulgarises" transcendental activity and constitutes, as it were, its model.

It seems to me that these are the points of departure for our reflection, as for all epistemology, all esthetics and all contemporary ethics; that it is a question of Bachelard's "non-Cartesian" epistemology, not founded on dogmatic illusion beginning with an absolute truth; of Brecht's non-Aristotelian esthetics (that is, not founded on "mimesis") and of what I shall call non-Platonic ethics, i.e., not founded on the observance of rules but on the creation of new forms of life.

With the possibilities he carries within himself, man more and more appears to be "the incipient poem of the universe" in Heidegger's words. He is no longer ruled by the imperative external forces of destiny or providence but by the creations of his will, his dreams come true, his lived utopias. "Utopia is tomorrow's reality", Corbusier once said.

Esthetics thus is a privileged way of inventing the future. It teaches us to distinguish the forms of knowledge fitted to seize the different levels of reality:

- the object can only be understood through the concept
- the subject can only be grasped through love
- the project can only be designated through myth (or poetry)

One of the profoundest dramas of our era is that in our daily life, these different levels of reality are dissociated, and this fragmentation even destroys man. In his work he must deal with the object, and his method of approach is the concept. Even when he must deal with other men, he treats them in terms of the one concept, in other words as objects, technocratically; or again by the positivistic methods of the so-called "human" sciences which, under the pretext of being scientific, refuse to conceive a level of reality which escapes the concept and consequently can only have as an object a world without man or a world of alienated robot men.

In his private life, contaminated by the world's work models, relationships of construction and competition and in business, he rarely encounters love; the "other man" is only an object to manipulate, to condition, to seduce or to conquer -- at best, a partner for debates or negotiations (through concept). On the contrary, he represents what I lack, what I cannot be, the revelation and the gift which could have given me my only chance to become perhaps a more complete man, such as <sup>him</sup> ~~he~~ who greets with love the creative love of Christ, arch<sup>e</sup>type of the "other man" and through whom only one God can give me actuality, life and searing emotions.

Art in turn is caught in the meshes of the object and the concept, either because its human "value" is treated as commercial in every capitalist regime where the market rules supreme, dominated by those who swallow up huge financial appropriations: the film producer, the publisher, the impresario etc., or because in the so-called socialist countries art is evaluated and exploited according to its utilitarian value in the system's obligatory apology. In the two cases, the perspective or prophetic dimension of art is given birth and destroyed by the "uni-dimensional" world of the object and concept.

In this shattered world, what role can art play in creating man's unity? Essentially art is prospective, like work itself. As Marx observed in his Capital, work in its specifically human form, unlike the work of the beaver or the termite, is man's act of transforming nature and himself, but preceded by an awareness of its ends.

Man is born with work, and work is born with the emergence of the project; with man, the future becomes the informatory force of the present. This is how human history is radically distinguished from natural evolution.

But in the very course of history, work has become splintered and alienated.

a) in every class society (slavery, serfdom, capitalism, for example) the choice of aims, i.e. work in its specifically human dimension, becomes the privilege of a class -- that class which possesses the

means of production (man himself as slave master, the feudal landowner, the capitalist proprietor of corporations and machines), since so-called work is an activity mutilated in its properly human dimension (the choice of aims) and amounts to nothing more than a more or less blind execution of the master's orders. It reduces man to the condition of an instrument, the specifically human form of torture. (It is not by chance that the French word travail derives by distortion from tripalium which designates an instrument of torture). Thus, man is nothing more than a thing in the geared machinery of things, a link in the chain of causes and means, an appendage of flesh in a steel appliance.

So work is estranged from life. Man's life itself loses its human specificity, and work becomes the ransom of leisure, love a strategy, art an enterprise or form of politics.

b) Art, which does not accept this disruption in the unity of life, this perversion of faith, today finds itself, everywhere and under all regimes, generally deprived of communications means, while a new tragedy is added to so many others: dismemberment, division; or rather it renounces itself. Moreover, to maintain contact with the popular idiom, it is constantly at grips with the manipulation idioms -- commerce, publicity, empiric policy -- under the threat of remaining otherwise hermetic and illegible to the mass public.

Finally a last rift, and not the least, which mostly distinguishes work from art is that the purpose of work is the naked satisfaction of utilitarian needs (food, clothing, housing etc.), while art need only answer the specifically human need to restore to man (to every man) the image and proof of his innate power to create.

1. Only art, indeed, recalls to man his own specificity: transcendence. I have sometimes said that revolution, like art, has more need of transcendence than of realism, because I believe there is no education more revolutionary than that which teaches man to behave towards the world and "society" -- the established order -- not in terms of a reality already achieved, but in terms of a work to create. To be

revolutionary in any community whatever or to be capable of a conversion in faith, this is to precede the future in the artist's attitude towards the work he seeks to create.

2. What makes art one of the most powerful methods of approaching the future is that it teaches us to "disontologise" the real, to consider it not as a being or an essence external to us, independent of us, superior to us, but as a task to fulfill. Instead of trapping "one-dimensional" man in an unchangeable order, art allows for this critical detachment and sense of man's participation in reality, which convinces us, against all positivism, that the possible is part of the real since man makes it so.

Positivism is not only the world without God but also the world without man. By enclosing the past within the limits of statistics, it encloses action within the limits of the establishing order. When futurology becomes positivist, as Robert Jungk has rightly written, it becomes the instrument of a "preventive" war against the future to colonise it for the profit of the present. To positivist futurology a simple extrapolation departing from the present and past, a simple technological forecasting of methods, we oppose an esthetic perspective, which is essentially an invention of goals, values and direction.

3. It is to recognise art as a function not only prospective but also prophetic, because the essential teaching of Israel's prophets was the struggle against idolatry, in other words, the tendency to consider what man's hands and spirit have created as an idol, as an absolute (finished and definitive). It is already the struggle against alienation, an endless struggle; as Bertold Brecht wrote magnificently: "The world must be changed; then the changed world must be changed."

Thus far, we have held only to the theoretical level.

We have tried to understand how esthetics can be an instrument for inventing the future.

Now I should like to offer practical suggestions concerning two recent, arts which can be decisive in preparing souls for the "future shock", because they are means of communication invested with a

potency not shared by the other arts: television and the cinema.

It goes without saying that analogous demonstrations could depart from the other arts: architecture, urbanistics, the dance, theatre, poetry, fiction, music and the plastic arts.

Here I shall proffer only two concrete examples:

A: a project for a series of telecasts on the theme: "inventing the future".

B: a film project on the theme: "imagination in power".

A. PROJECT FOR A SERIES OF TELECASTS: INVENTING THE FUTURE

1. Purpose of the telecasts: to help thousands of people grasp the need to build the future together, not on the basis of ideologies born in other historical contexts but on the basis of common problems posed by the great changes taking place in the second half of the 20th century, and their consequences.

2. Principles and methods for such telecasts:

- to pinpoint what is "germinal" in the realities and discoveries of today, what constitutes a fragment of the future already with us.
- to show that this future is not a scenario already written but that it depends upon each individual's responsibility and decisions whether this new mastery by man over nature and history becomes a malefic, regressive, destructive force or whether it is possible to prolong the human epic, begun three million years ago, towards a full flowering of liberty and of the individual.
- To emphasise that his future cannot be "bestowed" by a few perspectives specialists or a few technocrats, but that the future of everyone must be the work of everyone.
- to suggest that beyond the outdated categories of the "left" and the "right", there are others which, unable to discern the nascent future, are entering the future backwards, and those which,



open to what is radically new in our times, seek to create new structures answering the needs of what is emerging and what is developing.

Such telecasts must not only fuse scientific rigour with the highest artistic quality; they must also be accessible to everyone and arouse the universal enthusiasm of all. This means that there should be no more than two or three yearly telecasts in this series, and that each one must be at once:

- a scientific synthesis, accessible to everyone, on an essential problem;
- a dramatic episode with vast popular appeal, bringing home to each viewer the dramas and hopes of the year 2000.
- the interpretation of each viewer as he becomes aware of the problem, of his own personal responsibility in its solution, of the possibility of inserting a human decision into the chain of determinations and the range of possibilities.

### 3. Structure and schema of the telecasts:

Each telecast in the series must include five "moments".

1. The moment when the viewer grasps what is "germinal": the point of departure of each telecast is a pioneer realisation already existing. For example, a computer, a biology laboratory where the manipulation of man's genetic code is being prepared, a wholly cyberneticised factory, an architectural complex or an urban project for the city of tomorrow, a work of art, a scientific or technical discovery etc. In each case, the camera familiarises us with this new reality, its functioning and its meaning, its human repercussions on work as well as on the personal lives of those who have conceived it or who manipulate it, with the problems, dramas and promises it entails from today henceforth.

2. The moment of extrapolation and of the catastrophic drift

The telecast's second moment will show the extrapolation, at once quantitative (generalisation and passage to the limit in the direction in which this discovery is drawing us). Just as Cuvier reconstructed a prehistoric animal with only a bone fragment, this requires a "future archeology" to be worked out, to show by extrapolation what contradictions will arise if there is no human intervention to present the "catastrophic drifts" of historical determinisms abandoned to their own devices.

3. The moment of decision: the scenario interrupted:

This is a sequence focusing on the decision which will determine the new orientation, with its multiple contradictory demands to be answered (spontaneous claims of opposing groups, conflicting ideologies, the pressures of existing rules and the anarchic confrontation of these norms). Just when the responsible authority is about to decide, the scenario is interrupted and the viewers creative imagination solicited\*. "The problem has been put in its historical perspective; you have the entire dossier in your hands; what decision would you make?" The first part of the telecast begins after one month of "suspense".

4. The moment of possible futures: the scenarios contrasted

To avoid giving a false impression of a destiny, of an ineluctable future which we could only foresee in anguish, but rather of a future comprising several possibilities which we must invent and realise, it is not enough to show (as the interrupted scenario has suggested) where the human choice and decision can be inserted; in the second part of the telecast, beginning with the two or three most plausible replies, two or three contrasted scenarios must be presented to give a concrete image of each option's consequences.

For example: does the cyberneticised plan exacerbate man's growing

alienation, as Huxley and Orwell imagined? Will there be no joy left except for drugged robots?

- Would the biological manipulation of the genetic code, indeed the creation of the artificial embryo, lead to the destruction of the family, to dehumanised love, to sexual perversity: or would they, to the contrary, give man such mastery over his own nature as to make him a creator of gods?
- what will become of the thought process when every individual will have, at every moment, the totality of human knowledge at his fingertips through the miniature transistor connecting him with giant computers so that he can communicate with them? Will the computer make it possible to realise an inquisitional police and political system or, to the contrary, the first "direct democracy" since the Greek city-state, recording and determining the will of fully informed citizens at any given moment?
- what will become of the city?
- what will become of education? etc.

##### 5. The moment of operational debate and the telecast's feedback

The last act of the transmission will be dedicated to evaluating the images.

- a) An extremely frank, "responsible" debate must be held in the form of a round table. It must not be academic or polemic in character, but rather operational -- in other words, purporting to suggest the choices and decisions capable of realising that possibility which can make every man a man -- in other words a centre of responsibility, initiative and creation.
- b) It would be advisable to assure the telecast's feedback by correspondence with the viewers, giving them total participation in this invention of the future and progressively including on the programme those who have contributed the worthiest criticisms and suggestions. (Needless to say, a week or two before the first segment,

the series should be preceded by a few short sequences -- "absorption flashes" -- to show the meaning of the series and prepare the public to welcome these unusual telecasts).

A new style of television, even of civic life can thus be created based not on the viewer's passivity but, conversely, on his activity and creative participation.

B. PROJECT FOR A FILM ON: "THE IMAGINATION OF POWER"

Like all the arts the cinema cannot be either the simple reflection of the external world or the only projection of an interior world, but the creation of a possible world.

Like all the arts, it can only do so by appealing to the spectator's participation. Here is the common denominator of all modern art. Since the end of the 19th century, painting has made us realise that looking is an action, not a passive reception. Modern dance, since the beginning of this century, is not only spectacle but also a celebration. In this general movement, the cinema, more than any other art, can grip us and create myths, borrowing all their elements from reality.

Different from the novel, it is free from the mediation of the world or sign; an immediate art, it puts us directly in contact with the image, with colour, with movement.

Different from the theatre, it is free from scenic space restrictions which impose upon us an immutable position and relation in terms of the object. It is an ubiquitous art in time and space; it can be a witness as, for example, in Alain Renais' "Hiroshima, mon amour".

Different from painting, it is free from temporal restriction. It is the art par excellence of time. Not that of clocks and calendars, but the time of decision, of free creation. It is not bound to linear time. Instead of being inserted into it, it creates a time of its own, human time.

It is the art of the possible.

Until now the cinema has drawn mainly on memory and history, on the past. Very little on the so-called future.

In general the possibilities it has proposed have been myths of escape

and alienation. This means the mythology of "stars", or of the thousand ways one can live in the consumer society, in the world of violence, drugs and sex. Its typical "heroes" are the billionaire, the gangster, the seducer, the superman, the derelict.

When it has attempted to explore the future, it has usually hewed to old utopias, using methods invariably nostalgic or pessimistic because they proceeded in reverse of true creative imagination, never departing from the future to transform the present but extrapolating the present, as did Wells, Huxley, Orwell, Truffaut in his Fahrenheit 451 and Kubrick in The Clockwork Orange -- extrapolating the violence of today and finding the remedy only in present-day manipulations. Where is the future in all this? To inaugurate the future, in the cinema as in all arts, is not a matter of making us more aware of today's impasses and anxieties, nor of handing us a ready-made future, as if the future existed like pre-Colombian America, as if the future were a written scenario in which we need only play the roles like "marionettes put on the stage by the structures". An art which truly opens the future, which helps us to invent it, need not bring us prepared recipes, but should simply help us recognise on what we can base our hope and from what decisions and inventions the future can begin.

In literature, the last optimistic poetic utopia is far behind us -- perhaps the Novels of Nowhere, written by William Morris at the close of the 19th century.

Nearly a century later, the cinema has not yet created a work of this kind. At best, it proceeds not by extrapolation but by subtraction; the future is the present minus the maddening factors of present-day life. (I am thinking of a film like The Year 001).

Thus, art is behind the times. The spring of 1968 -- if we subtract its superficial aspects and its dress - posed the fundamental problem: our way of life is not the only possible one, we can live differently. That spring produced a highly stimulating slogan: "Put imagination in power". Here, it seems to me, is the very principle for a radical

renewal of the cinema if this art is to relate to the life now coming into existence, to precede it, to stimulate it rather than follow, restrain or escape it.

Change in the very concept, imagining new models of work organisation, new models of consumption, new forms of interpersonal or community relationships, new forms of leisure and beauty.

Change in the very style of film production, with professional actors no longer asked to imitate already existing or chimerical forms of life in keeping with the reveries manipulated by publicity but, conversely, to ask real people to invent and project a possibility of themselves -- not in the neo-realistic manner, saying: I am going to follow you and spy on you to reproduce your real life without your knowing it; or: in reality you failed to commit suicide, do it again before my camera -- but rather challenging men and women to surpass themselves. For example, in the form I am presently experimenting with in preparing a film to be called Put Imagination in Power, which will pose this problem: what would it be like if 1968 has succeeded? To magnates, unionists and young people who lived through the events of 1968 and didn't know how to cope with them, we propose the following creative experiment: we are going to create the conditions of a new 1968, which will be profoundly different from the real 1968 because there have been many creative experiments ever since: the Italian "hot autumn" of 1969, the 1970 riots in Poland; the shipyard upheavals in Clyde, Scotland; the revolt of the Lip workers in Besançon, the revolt in hundreds of "basic communities", religious or lay, where incomes have been pooled and goods purchased collectively to promote man rather than subject him to current fashion, publicity and gadgetry; there is an awareness of what the spiritual and militant experiments of the Eastern world can contribute, etc. In terms of all this, if such a situation crops up if you are confronted with such a crisis, such a contradiction, today how will you invent the beginning of an answer?

Such a conception of the film and of art in general, exerts a direct influence on life. It means understanding men and institutions in the process of changing, of inventing themselves in a nascent world. To oblige man to invent a possibility of himself, to oblige the group and institution to structure itself in a new way and to function in a new way.

The film, the work of art in general, is a fragment of invented future which serves as a leaven for the present and catalyser for the future. Then, but only then, can art fully play its role, appealing to the spectator to participate in the continuing creation of man, not to identify himself (according to the old mimeses, the old "catharses"); nor even simply to remove himself from reality, to unrealise, relativise, and defatalise it.

All this continues to exist as real moments, as the basis of a "prospective" prophetic art, but its essential mission is:

- to make possible a critical judgment on the given world and the established order;
- to stimulate the need to invent - starting from lived-with contradictions -- possible futures which can surmount them; and.
- to communicate faith in man's power to overcome and master every situation and to be content with no realisation.

## MOTIVATION FOR MUSEUM VISITING

By: Erika Landau  
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The questions that initiated this research, a pilot study, based on a small sampling of visitors to the museum, are the following:

1. What motivates people to visit the museum?
2. What expectations and anticipations are fulfilled by such a visit?

Since this problem has not been dealt with, to my knowledge, in existing museological literature, I have taken my references from psychological and philosophical literature.

The basic assumption underlying this research is that man, alienated in the modern world that is changing with dizzying speed, seeks today from the museum and art generally the kind of satisfaction he formerly obtained from religion and from living in a narrow social framework of a more static world.

#### Background to the research

The assumption so far has always been that people visit museums for pleasure. Yet what are the sources of this pleasure?

Freud explains the matter, this way: "The psyche knows a method of deflecting suffering by transferring the libido from one sphere to another. The aim of this method is to avoid the suffering caused by the individual's failure in his contact with the outside world. In Freud's view the method works best when the individual gets to "pleasure" by setting himself intellectual and artistic goals. For this is a non-personal,



general sphere where the individual can activate potentials which he would not dare to activate in the personal sphere.

Initially Freud thought that only a few were possessed of this faculty and likewise that only a few people were endowed with the capacity for artistic creation and self-analysis. Later he came to discern the particular faculty of attaining satisfaction through the imagination also in people who though not themselves creative could appreciate the works produced by others. Thus artistic experience can provide ego satisfaction even through the mediating agency of the artist. This type of experience is especially valuable as a source of satisfaction and comfort in one's life, Freud maintains. He compares the source of this particular satisfaction with the source of another satisfaction, namely religious belief, and he quotes Goethe: "Whoever is master of science and art also has religion; whoever is not master of the two, had better go and seek religion".

Ideas similar to those of Freud and Goethe I found in Jung. He talks about the individual's need to find goals which he can observe, describe and test. With some this will be religious experience, with others artistic experience. The essential condition being that the goal provide the individual with perceptible meanings and beauty.

Erich Fromm also speaks of religion and art in the same breath. Religion and art provide an orientation, a home as it were in the vast cosmos.

From these observations of Freud and others I extracted the conclusion that art experience is very much akin to religious experience and often serves as its substitute. probably because it satisfies the same psychic needs. The individual needs to believe in something, he needs some definite sphere to which he can belong. This belonging may be to a tradition, a group, or a

situation of some kind.

Jung says that the belonging for the beholder comes through contemplation, since the artist projects for him the psychic life of all mankind. The artist is the "collective man" and he gives expression to the collective unconscious. (Towards the end of his life Freud also talked about certain traits carried by all of us - a kind of primordial inheritance). When he creates the artist draws on the deepest psychic levels of his personality, which are common to all mankind; what is important are not conscious intentions but what the artist does and how the beholder sees his work.

Martin Buber, though not plumbing the psychic depths like Jung, speaks of the individual's encounter with the work of art as of something real, a "meeting" between man and man, between the beholder and the creator. This experience gives the beholder the feeling of belonging - to a tradition, a group of people, a situation he can identify with.

To Sartre long talks with the sculptor Giacometti have brought the conviction that a change has taken place in the way we look at works of art today. While formerly the work was seen as standing by itself, today it is within a situation. Formerly the sculpture was a being, today it is a being situated.

For Camus' contemporary individual, his "rebellious" man (l'homme revolté), who feels himself the outsider, the meeting with beauty is all-important. It is the link with mankind, the link with hope, hope for the good and for that unity which was his life ideal.

Art is the way to understand the world, to understand nature, a creating anew of nature and the world, as it were, Coethe said. Through art we learn and understand without fear of hurt. This fear of learning is a subject which has occupied many psychologists in recent years. Maslow, for instance, talks about the fear of the novel which might bring the terrifying unknown of the painful familiar. The individual would rather not know than be hurt.

Art, we think, affords the means to learn without the risk of hurt, since it is a non-personal sphere, a kind of neutral zone.

### Summary Assumptions

- The visitor to the museum looks for experiences.
- as citizen of the modern world he is alienated from nature, religion, his fellows and from what he himself produces; he looks for ways that offer the possibility of "meeting" with his fellows, with full situations he can identify with.
- His desire is to learn and understand within a safe, neutral and non-personal sphere.

THE METHOD

During one week questionnaires were handed to a random sampling of visitors in the Glass Museum, above the age of twenty. A stamped addressed envelope for sending in the completed questionnaire was provided.

The Questionnaire

The questionnaire was divided into three parts:

1. Personal history: age; profession; country of origin; interests; hobbies ; education; address (town, suburb, village or kibbutz); preferred entertainments (theatre, cinema, sport, dancing); preferred reading (non-fiction, fiction, detective stories, newspapers, magazines); religious attitude (observant, traditional indifferent, agnostic, atheistic).
2. Approach to Museum and Art.

What made you come to the museum (advertisement in newspaper, happened to be in vicinity, show it to the children, desire to get away from something , special interest)

How do you prefer to visit a museum? (alone, with your family, with a friend, in a group)

What do you enjoy about a visit in a museum? (it calms you down , gives the opportunity to get away , the opportunity to learn, to pass time).

How do you prefer to see an exhibition? (with an expert who explains things to you, read the explanatory labels beside each exhibit, with a printed catalogue or pamphlet on the exhibition, let the exhibits speak for themselves).

You enjoy ? ( the atmosphere of the museum, the museum is another world, gives the feeling of belonging to a long tradition, being close to man , - the creator)

*etc.*

The different choices were graded in advance scores ranging from 1 (minimum) to 4 (maximum).

3. Quotations, from philosophical literature, bearing on weltanschauung, relationship to fellow-being and things, alienation of modern man, being part of tradition, desire of belonging, drive to communication, etc.

- Real life is the "meeting" between man and man. (Buber)
- The meeting with man is also through man's creation. (Buber)
- We always want a full situation - in art as in entertainment (Sartre).
- An Artistic creation does not have to be eternal. (Giacometti)
- The beauty of antiquities reminds us of the childhood of humanity we like them because they reminds us of our childhood.  
(Karl Marx)
- When man parted from nature in order to supervise nature he began to be alone. (Raymond Williams)

There were 24 quotations in all to which responses were asked. The possible responses were: 1. Identify. 2. Agree. 3. Don't agree. 4. Against.

The answers to the questionnaire were anonymous.

### Processing of Results

100 questionnaires were handed out; and 36 completed questionnaires were returned, of which two were disregarded because they were sent

in by people below twenty.

For the second part of the questionnaire "Approach to Museum and Art" the average score was 3.3, that is a fairly high score. The standard deviation was 0.278, and the variability 8.3 % .

Interpretation of results: The approach of the visitors polled was responsible and serious, and hence the results from the third part of the questionnaire refer to a sampling of museum visitors representing a homogeneous population with a serious approach to the museum.

### Results

Who is the museum visitor?

- 92% without religious belief.
- 80% with higher education (20% secondary education).
- 98% for whom art is an essential part of their lives.

What did the visitor seek from the museum?

28 out of 34 came to the museum in order to learn.

3 wanted to get away, 2 wanted relaxation (to calm down)

21 want explanatory labels beside the exhibits.

6 want an expert to explain to them, 3 prefer a short explanation (label).

2 say that the work should speak for itself.

80% replied they wanted a full situation - in life and in art.

91% identify with the idea that real life is the "meeting" with man, and by the same token also the meeting with the product of man's work.

97% agree that they need a tradition, and 76% are looking for a tradition to which they can belong.

## SUMMARY AND CONCLUSIONS

The visitor comes to the museum in order to learn. Through the exhibit he is able to "meet" with man and this meeting is important to him. His visit can show him that he belongs to a tradition and thus diminish the degree of his loneliness.

The visitor prefers explanatory labels with the exhibits, so that he may obtain a full situation he can identify with. Not all the results touching on visitors' alienation, their approach (attitude) to beauty and art has been quoted here. It can be fairly claimed that our assumption that art experience is of the same kind or is a substitute of religious experience has been confirmed. The results should certainly encourage larger scale research in this field with the object of gaining an overall picture of the types of visitors to museums and their different expectations.

Such research should also help to guide one in determining forms of presentation (display) and publicity for attracting visitors to the museum.

## ESTHETICS, TECHNICAL AND POLITICAL PERSPECTIVES

By Filiberto Menna  
Professor of Art History

1. An uprooted condition

Every day we clash with the compact efficiency of the industrial society and the unforeseen flexibility of a system which appears capable of absorbing any alternative operation and rendering it sterile. We must take account of the uprooted condition in which the artist and intellectual function, obliged to operate in sectorial spheres which are more and more estranged from the great movements of opinion and the forces propelling and guiding society. The opiate absorption ~~by the~~ part of the well-heeled society represents a bloodless end such as decreed by the East, after the generous Czechoslovakian illusions. Aspiration toward a free society, in which politics and culture, ideology and aesthetics work together, has once again suffered a setback. Yet, these are decisive times; nevertheless, events are constantly changing everything with extreme open-mindedness. Power relations among men are being contested on all levels.

2. Political reasoning

Today, political reasoning seeks to aggregate all areas of action to itself. It proposes itself again as the leading force for every possible transformation in man and society. Again it circumvents the sphere of intellectual action, again it turns a deaf ear to any suggestion of a specifically cultural discourse and replaces it, without any margin whatever, with political action in the strict sense. Even more, esthetic space is being narrowed, and there is a growing distrust of any possible incidence of artistic creativity. More than ever, Heidegger's alarmed cry is being sounded: "Why poets?" This question is indeed current because it indicates an insecurity in the face of the esthetic dimension and at the same time assumes the sense of a rash defence of poetry. Interrogations on the wherefore of technics or politics seem senseless; indeed to pose them one runs the risk of being relegated to the ghetto of eccentrics. But such



questions are beginning to circulate, especially since it has become clear that in the major spheres of world influence today, technics and politics have led, by various channels, to the total manipulation of man. We must truly grasp at long last the inseparable relation between means and ends, since we cannot continue to delude ourselves that man can be transformed without his knowing it.

### 3. Politics and metapolitics

We must proceed to a radical critique of political ideology which seeks to impart from above the laws of individual and collective behaviour, a critique of political ideology as an exercise of power presuming to set forth the inviolable fundamentals of the theory and practice of every human activity. Conversely, we must demand a redefinition of the very idea of politics, and its transformation into metapolitics -- interpreted as a global theory and practice of liberation -- which will allow every human activity its own specific awareness and specific action. In every discipline, metapolitics reveals the liberating potentiality it possesses, which must be developed autonomously and brought back into the general mainstream of human experience. Metapolitics recognises that man can achieve liberation only if he advances, according to specific means and moments, along the entire front of knowledge and action. Metaphysics, then, acquires the meaning of a fundamental intention of liberation, it becomes the bearer of a telos which expands the horizons of single activities, including politics.

### 4. The dominion of the imaginary

Art and the esthetic dimension play a fundamental, indispensable role in man's liberation process. Art functions in the dominion of the imaginary, on deep individual and collective strata which must necessarily be considered structures of the real, at least on a par with socio-economic conditions. Art and the esthetic dimension appear to have a deep biological root if it is true -- as many experimental data would seem to demonstrate -- that an esthetic activity exists in some animals in the higher categories. This activity responds to profound biological and physical needs and

organises them into concrete, objective structures. But because of this activity emerging from deep, remote areas, the artistic object would seem to be enveloped in a sort of halo, in a permanent, bizarre phosphorescence. The work itself takes its place in an intermediate zone between the imaginary and the real as the tangible result of an experience (which we can define in psychoanalytic terms as transitional) supported by the everlasting desire and constant collisions with the real. Art is somehow anamnesis; it brings with it the memory of (relatively) constant structures, and anthropological invariants. From these constants, art draws its alternative models and confronts them with the present (the real), creating the prospect of a totally different universe. Thus, artistic imagination bears within itself a powerful Utopian charge, and stands as a protest to the discords of today's world and a prefiguration of what Blanchot calls "a world overturned."

##### 5. Art as a model of alternative behaviour

Artistic endeavour gives us a model of self-directed behaviour, on which it is possible to base a new relationship between the individual and his social environment. In the antagonism between constrictive and spontaneous work, between economy and eros, between the efficiency of maturity and child's play, art and the esthetic dimension invariably chose the second alternatives and base their absolute discard of the reality principle on them. They indicate a possible way to "change reality<sup>to</sup> conform with the principle of pleasure" (Norman Brown). Assuming a liberating function, they clarify it, not only on the mental level by supplying new instruments for understanding reality, but also -- and more especially -- on the global level of profound psychic strata and re-evaluation of the entire sensorial sphere. Thus, art and the esthetic dimension affect the whole person, and help to realise, in the Schiller concept, "the whole man within ourselves", regaining their ancient therapeutic significance, abetted this time by the decisive contribution of psychoanalysis and the human sciences in general.

## 6. Verification of the human sciences

The esthetic perspective, which implies in artistic creativity an irreplaceable factor in man's liberation process, encounters various points of similarity with certain perspectives opened up by contemporary human sciences, such as anthropology, sociology, psychoanalysis and philosophy.

In Lévi-Strauss' work, anthropology fulfills not only a purely historical retrospective function, but also the sense of a prospective anthropology. The social forms studied by anthropologists are not merely historical documents; they "would also correspond to a permanent possibility of man." Thus, primitive societies, founded on the consensus and direct participation in communitarian life (the "cold" societies), could, through <sup>circular</sup> the/series of their tribal structure, constitute a model of reference for more evolved societies (the "hot" societies), in which culture and progress go with more fragmentary forms of life and stronger differential discards among the group's single components. Anthropology thus can reopen the discussion of the whole man and entrust his realisation not to a mechanical prolongation of current life forms, but to a model of integration, progressively unifying the typical characteristics of the cold and hot societies." Hence, Lévi-Strauss indicates the possibility of recovering the natural, spontaneous interrelated and integrated dimension of the primitive world, passing through technological progress and the hot means of modern societies while, from another angle, prospecting the advent of a post-industrial society foreseen by other points of observation. When the anthropologist transfers the "ancient Cartesian dream of putting machines like robots at the service of men" to the future, his forecasting approximates that of Garaudy, who maintains that "cybernetic transformation makes possible an unprecedented burgeoning of human subjectivity," and adds that "different from the machine of the 19th century, which made man a servant and an expedient, the 20th century machine can free him from all tasks except posing problems and deciding goals."

Lévi-Strauss' anthropological perspective thus converges

with the objectives of the socio-philosophical perspectives proposed by Marcuse, Garaudy, McLuhan and Norman Brown, all of them founded, although in autonomous ways and on diverse theoretical bases, on the vindication of the imagination<sup>n</sup>, creativity, eros and play.

#### 7. Technological imagination

The perspectives of anthropology and the other human sciences converge on a basic point with technological perspective, with the prediction that man's millennial state of biological need can be superseded and that he can finally achieve a condition free from constrictive labour. Science and technics could play a fundamental role, such as foreseen not only by studies on the post-industrial society conducted in the "Western" area but also by advanced predictions in the socialist countries, especially in Czechoslovakia by Radovan Richta and his study group. But the problem once again lies in for<sup>e</sup>seeing the future as possible continuing changes, encouraged by man's inventive capacities, not simply prospects deduced from mere extrapolations of the present or the past. Contrary to the expectations matured particularly in the United States, these historical mutations must inevitably include a radical transformation in class relations and methods of production. The indications of the revolutionary political perspective must not, therefore, be overlooked.

#### 8. The convergence of goals

We have no guarantee of this future. Perhaps there is need for a discourse with many voices taking part, a discourse which excludes a return to any <sup>type</sup> whatever of hegemony. If politics alone cannot assure individual freedom but threatens to become a power machine given to total manipulation of man, then science and technics by themselves do not threaten lesser dangers. This is evidenced not only by commercial manipulation but also by biological manipulation of the human species, which is now a concrete possibility. Perhaps we shall be helped by politics, science and art, joined together in an ultimate goal to re-discover our generic essence, in a meta-political project which will shape and direct politics science and art.

## ART AND LIFE: SYNTHESIS AND NOT ALTERNATIVE

by Francesco Romanelli  
 Professor  
 of Morphological Structure

Nobody today any longer denies that a work of art and therefore art in general has the capacity and in consequence the opportunity to illuminate the future.

If, however, on the one hand, almost general agreement can be found on this subject, on the other, the opinions and ideas of the ways in which this illumination can be produced are very different.

I would really like to accentuate this contrast because, while one tends to consider certain methods of forecasting the future as almost natural products of artistic intuition, there exist on the contrary differences which are actually incompatible with understanding this capacity of the temporal prospective of art.

The general idea today is that, historically, art and, so also, life have at once some profound modifications in their way of existing on our planet, and that, while at first they lived more naturally together, now in a certain sense they have become disassociated and also distinct. More simply, either life and art disassociated themselves, or else art is no longer art (there are some who talk about the end of art), or else life is no longer life. There are the three possible hypothesis with the two variables.

It is thus coming up through the analysis of these three possible hypotheses that one could arrive at the yearning for the opportunity of an intense resumption of the forecasting activity of art, but this must be by reassociation with life and definitely not as an alternative.

I do not deny, but in fact, I recognize and try to spread, a profound sense of being fed up with alternatives.

Beginning by bringing up the last of the three hypotheses, the question posed is whether life is still life.

It is certain that in the past, after the parcelling and subdividing of man's work took place, profound modifications occurred in our way of living, modifications and ways about which so much has been written and discussed and about which everyone has his own idea.

Certainly, however, one aspect of life that has assumed great pre-eminence is productivity, efficiency in mathematical terms and the derivative of money with respect to time. One has progressively come to give a conceptual value to industrialism, as the Middle Ages had the Church and the Empire, until the progress of the productive systems has been made to assume the value of the dynamic principle of our historic being.

However, it is true that the positions of sociological relativism shared by the majority of contemporary sociologists affirm that every society is normal as regards its functions, and that one cannot speak of a whole society as psychologically ill and alienated.

Pathology can only be mentioned in individual terms because obviously we don't have at our disposal universally valid criteria of judgement to judge mankind as such and through which one can judge the state of health in any society.

I retain moreover that, be it conceptually or existentially, our productive systems and technological apparati will be accepted and seen with a good eye as elements characterizing our time; and the life which they consequently offer us will also come to be accepted with joy. It is only a question of re-entering the ranks (from which merely because we do write these things we feel out to act in a way that, through lack of values, praxis should come to substitute them. The problem becomes then a problem of language.

Having thus cleared the field from the last hypothesis, life no longer life, one comes to the other two.

Another two that must however be taken together, because one accepts that life is always such, as in fact it continues to exist, and one recognizes as obvious that art is one among many manifestations of life, so the two hypotheses mentioned before coincide in one alone, in as much as art is no longer art if it is dissociated from life.

At this point the discourse becomes a discourse of hypotheses.

If it is true that in the course of time many mechanisms have been invented for increasing the physical capacity of man (to increase the five senses for example) at a certain point other mechanisms have been invented that have increased the mental capacity of man, his possibilities of functioning and memory (if these are still only physical capacities I don't know).

If it was not easy to adapt himself to the first inventions and time was needed, to adapt to the second is more difficult, so that the benefit of adopting them has remained characteristic of very few.

At present: if for example the aeroplane has cut greatly into our way of life, the activity of the computer is cutting much deeper, even if unknown to us. Thus, therefore, it is always more difficult for life to happen completely and integrally and therefore to be lived and loved, and moreover it becomes ever more the dominion and decision of the few.

Of the few among whom till now it wasn't given to find was the artist as well as the technician.

Hence the consequence that art has certainly lost touch with life and has finished by proposing itself as an alternative to it, (perhaps only existential).

One doesn't want to give judgements on values or the level of awareness, one presses only to make known that today discourses on life and art are expressed in languages so different that they will never be able to meet and moreover it is useless to do so, unless someone can be found that consciously decides to assume the role of interpreter.

Here is the picture that today we are offered and in which we move: on one side efficiency, demonstrated indisputably by the calculator, necessary to survive, and in consequence power: on the other the underground, the hippies, the student movement, the charm of flights back and forth, rendered sweeter by the living experience of the Third World.

Many men in the street, do not even agree on this situation. They feel without power and without art and they agree "to be" only when

they are constrained to be less, to suffer. Many others however, also men in the street, begin to become aware, and from this awareness is born first the necessity and then the desire for a choice and the numbers of these last mentioned seems to be increasing.

The indication of the aim is obvious, it has been read also in the preceding lines: synthesis at all costs and no more alternatives. While however it is easy to indicate this synthesis as an aim, it is very difficult to indicate or even suggest the ways for it to be achieved.

Some examples will be given in order to try and illuminate in some way that which could be imagined as an aim.

One tries to imagine what the artistic genius of Leonardo da Vinci would have produced supposing the use of the calculator to be as natural to him as for example the ability to see. What could his drawing of serial lives have been, or his painting of the Last Supper?

One tries to imagine for example what the author of the passion according to St. Matthew could have composed if, apart from having the visual or literary experience of the men in his time, he had also been able to run through, alone by himself, the well noted experience of the researchers at Massachusetts Technology Institute.

Or even, if one imagines another artistic form, one capable of rendering this experience living and livable, which instead has remained only written, mathematical, and which, even if dramatic, has not cut into anybody's heart. I could imagine for example a new drama of love and death, one of the themes most discussed by artists of past times, on a new scale at the cosmic level. If no artist exists capable of doing this alone, running through in his solitude and with his fantasies the experience of death of the experts at MIT, equally no one will ever be found capable of inventing, and of proposing to the rest and therefore showing them an image of universal and cosmic love to oppose this death, even perhaps to resuscitate it.

These things are worth a scientific demonstration; but if they don't contribute art and the heart to make them livable, they will never be illuminated. We can also present the thing only in the form of an interrogative left open: what form of personal experience of the relationship of MIT should the author of "Guernica" have had to be made to represent his content in some way?

Clearly it is the ideal image desired by a man capable of building himself first completely as man, which actually means as technician, until he has a "natural" use of the electronic calculator similar for example to the way in which today he "naturally" drives a car. Man that, after having been put down, wants to reach this fatigue, to actuate this project by himself, completes himself as an artist.

This conviction will be accepted, necessary and loved; to construct one's own being and to produce valid and comprehensible values for those producing the methods.

But instead art continues to escape these realities that are also actually our life, shatters the work of the technicians and acts in an autonomous form, in an autonomous space, until it is useless and perhaps not even art. And the answer of the opposing side is the expected result.

In order to give a graphic mathematical image of the idea, one can say that at one time technics and art as manifestations of life were two vectors, not parallel, but compatible, for which the result they made would drag life and illuminate the way for it. And the two vectors could alternate comand. Today however, these two vectors are no longer on the same plane, they are crooked and as such they can no longer add up, with the inevitable consequence that life, supposing that one has reached the choice of one of these, is set necessarily far apart from the other... It is necessary to work to bring back the two vectors to the same plane.

Finally to try to illuminate what methods could be used to obtain this aim, I refer myself, as recently we have been trying to do, until now only as methodology, to the field of applied arts: architecture and urban planning for example.

The goal we fix is that of reaching a definition of a strategy of projective intervention calculated with scientific rigour.

This also derives from the fact that one must ascertain the errors committed, in as much as they are incapable, conscious or less so, of understanding and confronting the complex problems of the modern world, because they have wrapped up in myth their process of formal creation.

The methodology, schematically, in the first collection and then in the systematic organization of all data that can have relation to the object (anything on the scale from urban planning to design) consists of projecting and realising. One would pass first through a phase of scientific architecture that, through the work of many, should produce the meta project, still without some concern for form, and only successively could the "single" architect intervene to give an effective and spacial form to the metaproject.

Naturally the problems presented are multiple and the difficulties of application of the methodology are infinite, nevertheless our faculties of architecture resound with these reasonings.

The quantity of data for example that concerns even only the habitat of man is so great that the collection and systematic organization appear not only practically but also conceptually impossible. At that moment then one shatters the illusion of systematization, and subjective judgement and so on reappear. However, there remains, at least for now, the validity of the tentative.

I conclude, after this example well enough lived for my specific activity, with the wish and the hope that in future the electronic brain can become another "electro-domestic one or else, if this will be too expensive, that it can be adopted in a nearby library, so that if man is prepared at the end of school to converse with it, he can easily have at hand (and in mind) all the culture accumulated by humanity. Capable then of drawing out from the unmeasured memory of



a machine all that everyone desires and loves, there will remain to man only that which is specifically his: to think, to love, to pose problems, to make choices, to invent and create the new, and, above all, all other new things: his future. On the other hand, it will not be the same kind of internal thrust, but also those who are held to be gifted with artistic faculties must notice the need of traversing the reign of technology and knowing the meanings of it.

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ART: AS A RESEARCH AND DEVELOPMENT TOOL FOR HUMAN  
QUALITIES, AS AN INDICATOR OF THE FUTURE AND AS  
AN INTEGRATING FACTOR FOR MANKIND

By: Manfred Siebker  
Physicist

Instead of a Forword

This paper is far from being a concrete proposal for action. If in a second step such a proposal or programme were to be prepared, this could only be the task of an interdisciplinary team and it would only make sense if integrated in a wider scope of action.

The idea at the basis of the following pages is: to show that among the qualities of art there are several fundamental ones which make it a unique tool for anthropologists and, more generally, for those concerned with the exploration and mastery of the future of mankind.

My arguments are intended as an unconventional stimulus for reflection. They are moreover the profession of ever increasing belief in the power of art.

Warning notice: this paper is deliberately trespassing the fields of other working groups, in particular those of Groups n° 1, 6 and 7.

## 1. The Qualities of Art

### 1.1. What is Art?

The question is eternal and it would be childish to find here another unsatisfactory scholarly definition. A universe cannot be represented in dry words. It would be wiser and more just to use a poetic evocation instead.

Art is to see well-known things for the first time,

art is the reflexion of an eternal reality,

art is the presence of the ephemere,

art is going into the world and art is coming home,

art is love.

Art cannot be defined which is one of the aspects of its greatness. Let me now ask : What is art not?

Art is not evasion,

art is not correction of reality,

art is not closing your eyes on misery,

art is not nice,

art is no whore (it will simply disappear when prostituted).

And again another approach : what is not art, but sometimes taken for it :

Repeating in the manner of ...

Following a recipe ...

Being different by all means

Being sentimental

Being not sentimental at all

## 1.2. Art and Truth

The question : what is truth ? is as eternal as the question : what is art? But the relationship between art and truth is much deeper. No art is conceivable which is not hunger of real truth and hate of lies. Hunger to see not just one but all faces of an object, of a problem, of a person, of oneself. Hate of lies not only in the sense of wishing to be correct, but meaning to fight perversion of the truth, surrogate of the truth, false pretense, hypocrisy. But not only evil design is at the root of the untrue or of the lack of truth, but also inertia of the heart, the barrier of clichés, and an inarticulate fear. And it is again art (or love or real faith; who will always distinguish ?) which is able to produce the shock necessary to move your heart, to shatter your clichés, to articulate (as a first step to control) your fear.

It may, by the way, just be the artistic use of clichés which may destroy them in denouncing them as what they really are instead of what they pretend to be. (e.g. Warhol). On the other hand, insignificant objects or persons can be invested by art with            dignity, novelty and love inspiring frailty and therefore be apprehended with an intensity almost impossible to achieve otherwise (e.g. Chardin, Oldenbourg, Warhol).

### 1.3. Art and Change

Art is no cosmetic treatment. When it transforms, and it always does, then in order to open up a new prospect or to extract the essence of its object. It is not changing it. It is revealing it.

But art means change : your change! By a strange dialectic function, finding and "seeing with new eyes" means a change of your being. Not only your eyes become "new". Other parts of yourself which are not "in tune with eternity" (and therefore with love to your mortal brother) long for being changed in such instances. "Du musst Dein Leben ändern" ("you must change your life") is the surprising last line in Rilke's famous poem describing a sculpture of Apollo. Art is a tool for self-changing by finding. It is a chance offered which can be made use of in an active way instead of letting it pass by, at best in passive rapture. It is even a chance to be searched for rather than being left to happen incidentally.

### 1.4. Art and Human Needs

It is, of course, not intended to treat in this introductory sub-chapter the full meaning of its heading. I shall limit myself here to some ideas about the relationship between art and the problem areas dealt with in the other Conference Groups.

A general remark first. As art is to be found in all fields of human activity, with innumerable cross-links and hybrids between its different branches, it is certainly of systemic nature. It is also, in spite of strong and perhaps necessary ethnic and cultural influences, irreverent to national

bounderies, racial differences and class prejudices. It is of global nature. Art is inseparably linked to its own history which is at the same time man's cultural and spiritual history. Whether it progresses along some traditional line or whether it contests and revolutionizes: it is never indifferent to the past, or insensitive to the future. It is of diachronic nature. And finally: it is never lukewarm. Lukewarm is the temperature of kitsch. Art is cold or hot. It creates and postulates (or rather: finds) values, as a result of re-search in the proper sense of the term. It has a normative nature, which may be conscious in literature and theatre, subconscious and catalytic in music and painting.

This fourfold character of art (systemic, global, diachronic and normative) corresponds exactly to Peccel's "specification" for a tool for treating in an idiosyncratic way the human problematique as the Club of Rome sees it.

Now a few words to the relationship between art and the themes of the other working parties.

Ad 1: Personal development as a complement or alternative to economic development? Here I should like to quote Goethe: "Höchstes Glück der Erdenkinder ist nur die Persönlichkeit." (The supreme happiness of men - of the children of Earth - is only: personality). In spite of some slightly ironic undertones this quotation indicates the conviction of the artist as a complete human being that no other "poursuit of happiness" is worthwhile and, most important, that the appreciation of personality is accessible, in principle, not only to an elite but to all mankind. In Goethe's mind "personality" is not conceivable without the notions of "systemic" (he would

have said "organic"), "global" (he would have said "universal"), "diachronic" (he would have said "historical"), and "normative" (he would have said "prototypical" = vorbildlich).

Personality for Goethe clearly means: artist, taken in a broad sense.

Ad 2: Art has always presented instructive cases of man/society interaction. With all respect to personalities like Dante, Rembrandt, Bach: their work is penetrated by the spirit of the society they lived in, stimulated by dialectic response to it. Their styles were no independent creations but the perfection of the styles they inherited, at the same time triggering a transformation by opening up new prospects. Revolutionary movements against absolut<sup>ist</sup> and inflexible structures, constructive reaction to "schools" and epigonism, synthesis of autochthonous and estraneous elements, response and delay times in public acceptance, effects on life styles, mysterious oblivion and equally mysterious "resurrection" of artists in the mind of society : all these art phenomena have a model character in the general context of man/society interaction.

Ad 3: "Quality versus quantity".and "Choice and realization of the desirable out of the immeasurable potential of the feasible", these two formulas indicate, I think, the essence of the subject to be treated by Group 3. The same two formulas could well be used to define two of the essential features of art.

- Ad 5: Physical and ecological survival ? Without art in the broadest sense, i.e. without constructive and humanizing creativity, survival will be almost impossible in the long run. I am tempted to add: Without art survival may not even be worthwhile.
- Ad 6: Better and more widespread self-realization through communication between "all" ? The problem here is not so much the technical and organizational solution of an universal and democratic information network (although far from being an easy task) but the realization of true communication, not just the diffusion of ever more value-anarchic information. The example of art can be helpful in showing, how to skip ballast and how to screen-off or denounce lies (lies in the sense given under 1.2). Here the relationship between art and religion is particularly evident.
- Ad 7: Integral development of man as an individual and as part of the community of men? The function and model character of art as an integrating factor in this context has been mentioned already earlier (e.g. my remarks ad 2 and ad 6) as well as its affinity to religion.
- Ad 8: The alternative social models seen for (and by) countries of the South and the possibilities of common elements which may have diverse roles: at the first glance a link between this and art is not evident. But then, may not art be one of these "common elements" ?



Ad 9: Blue print for a new technology? No question, mankind cannot subsist in an orderly way and as numerous as it is now, without the application of advanced technologies. At the same time, it must be acknowledged that if ecological concern and the wish to humanize working conditions are to become more than objects of lip service, new kinds of technologies are needed, technologies not for profit-maximizing production of consumption "goods", but technologies the application of which may cause creative fulfillment, satisfying at the same time the material needs of society. Would it be naive to inspire oneself for that with the spirit of the ancient concepts of arts and crafts? After all: the ancient Greeks used one word for both:  $\tau\epsilon\chi\upsilon\eta$  (techne).

## 2. Art as a Tool for Anthropological Research

### 2.1. The need for a new impulse

The science of man is rudimental. It is only starting to be conceived as a comprehensive enterprise. At the present time it consists of a disorderly conglomerate of "superstructures without a basis" (Edgar Morin).

During the last 500 years, i.e. during the period after birth of the natural sciences, man has learned so much about the physical side of the universe that his power became almost god-like. At the same time, he has lost all restraint to put into realization what became feasible (scope and consequences being secondary considerations) that the future of the human species and even the subsistence of life on our planet are in danger.

X Not only did human nature and in particular the ethical and behavioural side of man not develop correspondingly (if at all), neither did our knowledge of what we really are, what we can be and should be. It seems as if man has been afraid all the time to look into a mirror. And probably for cause. Admittedly we look from time to time at a fragment, an aching tooth, a pimple on the nose ..., but never at the whole, at our physiognomy. We do not dare to plunge into the depth of our own eyes perhaps because we do not believe any more to have been created to God's image. Are we more afraid to see the ridiculous or the evil, the impotent or the brutal?

But how can we hope to get things under control, to realize a reasonable utopia which is feasible (however difficult to build) and not only the euphoric dream of a moribund, how can we hope to achieve all this without looking at us?

The only mirror which has at all times reflected the image of man in the light of his potentialities - evil, good, ridiculous, pathetic, heroic and pitiful - this magic mirror is : art. It is the richest mine of anthropological knowledge, needing "only" the development of systematic mining techniques, of smelting and refining procedures. Art geologists could at last find out how the minerals were formed in the past and how they are formed right now under our noses.

It should be underlined that looking into "the mirror" can be a dangerous undertaking. Caricaturists for instance show by far the highest suicide rate of all professions.

And even where the creations, triggered by the magic look, apparently show nothing but beauty, a step beyond apparence may open up an abyss. To quote somebody far from being a dramatic character, on the contrary generally considered a pure aesthete, Rilke : "Denn das Schöne ist nichts als des Schrecklichen Anfang". (".. as beauty is nothing but the commencement of horror").

The valorization proposed here is not without precedents. One of the greatest anthropological discoveries of our century, Freud's psycho-analysis, found its material in works of art created two and a half thousand years ago. This was a chance phenomenon, agreed. But why should we continue to leave such discoveries to chance? Nobody in his sound mind drills for oil without a systematic geological research!

If we look at a random list of research items which may be attacked by this "new" tool, we realize how dreadfully ignorant we really are:

- which is the relative importance of inborn features with respect to early external influences and later societal impact? Related to this: to which extent are racial dispositions or the sex of a person important for his characterial and intellectual phenotype?
- is man aggressive by nature?
- is man altruistic by nature?
- is man possessive by nature?
- does man need own children for fulfillment?
- does man by nature prime certain affections over personal sufferings and even death?
- does the individual need a goal with respect to society or just for himself or none at all, in order to be happy?

- does society need a common goal in order to function properly?
- is there in man's nature an answer to the question whether human dignity primes over individual happiness?
- what is dignity?
- what is happiness?

There is plenty of dogmatic answers to these questions, but very little real knowledge.

## 2.2. Art Analysis as Research

History of art has occupied itself for a long time mainly with classification and categorization of works of art along the lines of time, region and similarity. It is relatively recent, not more than 200 years ago, that a first effort has been made to correlate cultural and political aspects with artistic styles, generally in order to explain the latter by the first. Still more in the beginning is the work which tries to use the findings and theories of psychology in order to elucidate the coming-about of master-pieces. Right now sociological theories of art are "en vogue", seeing art as kind of a metabolic product of the societal body, somewhat poisonous for at least some part of it if society is not in harmony (which it never is).

All this is quite fascinating and instructive but rather lopsided. As we have said earlier, anthropology is a conglomerate of constructions without a basis. And they serve as research instruments, taken themselves as sure as the Bank of England, 50 years ago!

What I propose here is the opposite approach. Take as basis for departure and general headquarters the solid rock of our heredity in works of art (and of what we know of the objectivable conditions of their creation) and investigate the terrain chosen for the building of anthropology!

What is so confusing in the effort to investigate man is that the investigator himself is man. Man in the conflict of a million forces and fears, most of them silly and without significance in the light of the uniqueness of our existence. On the other hand: the degree of possible understanding is given by the degree of affinity between method and problem. Only man may understand man and only a wholesome spirit can hope to understand man in its totality (which is more than the sum of its parts).

Of all human productions (perhaps including reproduction) the only one not having the drab destiny of consumption (which is in the end: waste) is the creation of a piece of art. The mysterious general recognition of a real piece of art in the course of time means probably just that here something exists which represents a few pure lines of Man (again: not necessarily beautiful ones, and if beautiful, probably frightful too), lines not obscured by the million silly influences I called so confusing in self-investigation. And as to wholesomeness : who, if not the artist, is excluded from Marcuse's terrible constatation that man has become one-dimensional.

Correspondingly it can be said that every real piece of art reflects this wholesomeness, that it is a universe in the universe. If we start here, on the basis of artistic wholesome creation, imperverted by small or big lies and hypocrisies,

we can hope to explore the anthropological soil, to explore ourselves as we are, have been and could have been. On the same basis we may now also gain real knowledge about "the Others", separated from us by those million influences, most of which accidental and therefore insignificant in themselves: linked to age, role, social class. The "others" who have been separated from us by our way to see them, a separation only to be bridged by love. In this sense, love is a unique tool for perception, for research, as Nietzsche has already stated, surprisingly enough. Love as the highest and most intensive objectivity, namely dedication, is one of the ingredients of art, in creation and perception.

It is in the dialectic nature of this method that it not only reveals, stepwise, the object but that it transforms the subject at the same time. Us. Not changing + the essence does not change but finding ourselves.

All this sounds rather poetically. As a matter of fact : it is poetical. It is poetry as a tool.

This does, however, not mean that its working is just intuition. Nothing against intuition, it has served quite a bit even in the so-called exact sciences. Kopernikus, Newton, Kékulé, Einstein have been indebted to it. But they did not stay there. They checked back. And so should we. The provisional results of our anthropological research by art analysis have to be tried on new objects, that is on contemporary and future art and creativeness. We shall then see whether the findings may really be absolute and are not "dyed" by historical or accidental influences. Perception is a dialectic process; at its best it is a good shot to start with and a fast convergent iteration to follow. Hitting dead center is the exception. And not even a very instructive one at that.

As to the relative anthropological usefulness of ancient versus modern art, their advantages and disadvantages may well balance out. Ancient art can be considered more genuine in the sense that it generally had a servitude function and therefore was not conscious of being something "very special": Art with a capital A is a rather modern concept, leading to a reflected, self-conscious and hence often "put-on" attitude. On the other hand, it is certainly much easier to appreciate the spiritual environment of modern artists (in order to weigh the impact of its various components) than that of a medieval painter, let alone the sumerian way of life.

### 2.3. Creation as Research

The question is : what makes man tick? What are his autonomous motivations when fight for immediate subsistence is not prevailing and, more banal but equally important, when the million little problems and distractions of life are taken off him? When reactions to accidental influences are absent, the essence of man is autonomous. Its activity is : creation. The déplorable fact that majority of mankind is uncreative does not mean that they got no essence; it only signifies that accidental influences are too strong for them or that their creative core has been stunned at some stage of their life which most often is their early childhood.

The more precious, for our research purposes at least, are those whose creativity is functioning. To investigate this function in action can become an invaluable means of anthropological research. In this context artistic creation presents a certain advantage with respect to entrepreneurial and political creativity in that it is relatively free from power and control aspects which render autoanalytical efforts particularly difficult (and which may be more easily attacked by the "classical" sociological approach).

Artistic creation as the object of research cannot be but prevalently autoanalytical. This does not exclude a collective action, e.g. that of a theatre or movie ensemble which may be precious as it may check the danger of narcissistic exaggeration.

As it is the case with research in the exact sciences, it is important here too to "separate the variables" to the largest extent possible. This means among others that the impact of techniques and skill should be evaluated in order to be subtracted. In this context it is interesting to note that the graphical style in drawing (as well as in writing) has been found almost independent of physical handicaps even if they are extreme (like amputation of both arms, necessitating the use of the mouth or a leg instead).

The main subject of research in artistic creation will probably be the determination of the "affective spectrum" of the artists as a function of time, with respect to creation, creative pauses, and "other" activities or major events. The importance of artists' diaries may receive a new emphasis, quite outside of the morbid sphere of curiosity and autism.

The "dream weapon" of anthropological progress would of course be artistic creation voluntarily undertaken for the very purpose of research. It remains to be seen whether this is feasible or perhaps even contradictory to the nature of creativity. A dogmatic negative a priori answer to this question should, however, be avoided (Max Reger, for instance, did his composing according to a pre-established time schedule, like a good employee).



### 3. Art as a Development Tool

The creation of a work of art is development in a very pure sense. It is not blind "progress" (as we see it in some other human activities), it is no race without an end, but a labour to an end. Sketches, studies, essays are steps to perfection. And perfection finally achieved does not mean sterile satisfaction but the wish to start something new. Something new, not just something else. Should it not be logical to use art, the essence of which is development, as a tool for the development of man? To be clear: when I say development I do not mean "evolution" towards the Ubermensch, towards superman. No such elitist idea is envisaged at all, but the goal of accomplishment and realization of the divine potential of man.

The invocation to develop is omnipresent (as is the temptation not to).

#### 3.1. Art as Subversion of the Taken for Granted

The first obstacle to development is accepting matters at face value, accepting the cliché for the real thing, taking things for granted. All conjuring tricks are based on this principle. Here it is the essence of life which the Great Conjurer tries to make disappear. If one wishes to look through the veil of the non-essential not real, not true, one has to look at things (and man) as if one saw them for the very first time. Or for the very last one. This is precisely what art can do.

### 3.2. Art as a Demand to Change One's Life

X It is elementary that development means overcoming inertia. Inertia, by the way, is not only opposed to the movement of a resting body but also to the slowing down of a speeding one as it is to its changing of direction, an important point in the Growth debate.

Inertia means habit, routine, inconsiderateness. As we have seen when talking about art and truth and reading again Rilke's famous line, the impact of a work of art can help overcoming the inertia of the heart. This function may be even a touchstone to discriminate art from not-art. "L'art pour l'art" is absolute nonsense, at least in its usual interpretation; it only makes sense when signifying freedom of art from ideological chains.

### 3.3. Art as a Means of Personal Realization

Art means realization of personality as has been amply stated in the first chapter. Here just a few clarifying remarks. Art is not a decorative accessory to our life nor a nice distraction nor opium for the people (or rather for those who would never consider themselves people). The notion of "artistic hobbies" is a dreadful misunderstanding if not a pure sales slogan. Let us not quench our thirst for the real thing by a surrogate. Art is a state of the mind, a disposition of the mind which concerns life as a whole. It is not a tap to be opened and closed.

This appeal should not be construed as a wish to leave art to the "professionals", to an elite. All incentives to promote creativity are more precious today than ever before. But they should not be downgraded to a pass-time. They should instead become and be recognized as a new way to see which will eventually penetrate our whole life with the essence of universal understanding and fulfillment. Art is the contrary of killing time. Art is filling time. It is overcoming time by a notion of eternity.

#### 3.4. Art as a Communicational Tool

Inflation is the symbol of our time. Our civilization or rather commercivilization is a flatulance, a balloon full of volatile matter and ready to burst. Monetary inflation alone would not be such a bad thing; at least it does not make believe that money is an absolute value. Inflation and deflation of rubber toys are childish events. What is really dangerous is the floating of everything, leaving no absolute values at all.

It is certainly not by chance that these phenomena are accompanied by an unprecedented avalanche of "information", of data, slogans, news, lies; an inflation of information: information!

The technical means of communication between people, of "world communication", are tremendous, their potential is even more breath-taking, although in some conflict with political isolationism and Big Brother's privileges. But what is being communicated? Literally bits and pieces ("bit" being the measuring unit of data processing computers.

This may be suitable for man/machine or machine/machine "dialogues"; in human beings it is rather frustrating if not at the origin of a collective neurosis. Man can be reduced to a machine. He can be reduced to worse than that. But if he is not he wishes to express or see expressed what is bothering him, what delights him, what he longs for and what he is afraid of. Such communication cannot be made in bits, it needs wholesomeness, warmblooded understanding. It needs essence. It needs love. Each one of these terms is to be found in the qualities of art. They are also the qualities of true religion which signifies in other words that communication can become communion when there is common faith and mutual confidence.

What can all this mean in practice? It may mean:

Give the average man a chance to get in touch with art; access is not enough. Do not downgrade art to luxury or to a highbrow elitish pleasure. Do not flood people with surrogates. If you write or report, do as if you talked to live human beings, express yourself in a straightforward and fullblooded way which gives your idea, if it is worth it, a chance to get a place in people's life. Don't be snobbish, be sincere. And last not least help to turn down the volume of random noise on this planet.

It also means : love your neighbour.

#### 4. Art as an Integrating Factor

##### 4.1. Synthesis, Message and Response

Art is a force which never separates its objects, but embraces them instead, which puts all elements in their right place, according to their inner functions and nature. This is the general "message" of art. There is not way of charging it with extraneous ideology.

But synthesis does not necessarily mean harmony, not as long thesis and antithesis remain of different weight, of a different degree of development, of truth and justice. This is why art can cry out, may shock and scandalize, may trigger and foster revolutionary movements. That harmony and disharmony are not inherent to the work of art itself but reactions incited within the perceiving person or group, this fact becomes apparent when one thinks of examples which in their time were considered by friends and foes as being deeply subversive but which now are monuments of calm and stability. The weight of thesis and antithesis, then out of equilibrium in the mind of people -including probably the artist himself-is now in balance. But the synthesis of both has existed all the time.

Art is thus capable of anticipation. Its temporary message may change but its final one is invariable. It is the perfect integration of its objects.

#### 4.2. Artist and Wholesomeness

One cannot "also" be an artist. One may "also" be citizen, tennisplayer, customs inspector, even father or mother. But one is artist in the first place or not at all. And one is artist 24 hours a day. Nothing is too banal not to be impregnated by this fact. Art is a status of the mind, an irrevertible condition. A priest should be made that way.

Thus the artist is the opposite to Marcuse's "one-dimensional man". He is not reduced to one aspect of life (or zero) but is integration incarnated.

He may at that be rather specialized. But his specialization penetrates the universe. Mozart was a remarkably uncultivated person. The only thing he was really interested in was music. But the whole world was music to him and his whole life was music.

I even ask myself whether the formula is not reversible :  
that a wholesome personality must always be an artist...

#### 4.3. Art and Community

The integrating force of art to form and hold together a community should not be overestimated. Community has always meant non-community with others, a fact that stands against the synthesis-creating nature of the artist. This makes that art is necessarily transnational and trans-ethnic, in spite of the strong emotional ties binding each sensitive being to the spiritual environment which has filled his subconscious mind with its images.

Art strives at the universal community of mankind. More: it strives at communion with Creation as a whole. The artist, even if he professes atheism, acts as a man created to God's image. He is, of course, not exempt of the temptation to put himself in God's place but his sincereness with respect to his work and its objects - *conditio sine qua non* for art - will force him always back into modesty (which is not necessarily modesty before men).

#### 4.4. Art and Class-Conflict

No doubt, art can be a weapon in class-conflicts but it cannot be fulfilled by this function. It cannot even be primarily of that nature, as e.g. Böll has explained in his Nobel prize address and as Gorki and Brecht have conceded earlier.

As art is firstly veracity and secondly synthesis the tension it shows between thesis and antithesis, between truth and hypocrisy, between essence and pretense may easily become virulent in a particular historical situation. And it should be that way.

But the dogma that artists are creating in the interest or supposed interest of their respective classes, stands against all evidence. It is also incompatible with what we said earlier about the qualities and <sup>the</sup> integrating function of art.

## 5. Art and the Future

The heading of this chapter indicates, of course, the principal theme of the whole paper, its inner thread. It was not my intention -nor could it have been- to write something more or less original about art as such. The idea was to think about art in the context of Futures Research. Of all Group themes it was n° 4 which seemed to me the most original in a futurologist conference, the farthest away from my professional work, and the nearest to my heart. So I fell for it. The more I thought about the theme, however the more it occurred to me that art might not only be a possible indicator of the future and a means for the development of man's creativity, but that it could contribute quite a bit more to the allied forces who attack the Problematique of man's future.

So Chapter 1 became an evaluation of the general strength of art, Chapter 2 treated its techniques of reconnaissance, Chapter 3 represented in a way a review of its arms, and Chapter 4 was something like Tactics and Logistics. In the same spirit, the last chapter could be called: The Enemy, Strategy and a Glimpse of Peace

All this is not very Cartesian, I am afraid. But then: is not our confrontation with the Great Problematique a rather un-Cartesian situation?

### 5.1. The Syndrome and its Roots

Most modern malaises derive from one root :  
 in the absence of an absolute source of re-assurance faith, and of a meaningful self-affirmation (personality development towards an absolute image), people reassure themselves by surrogates (material wealth) and affirm themselves with respect to society by similar surrogates (prestige tokens, status symbols). These measures are no real help, being without intrinsic value and relative by nature. They lead to the endless spiral of consumerism, which in turn creates permanent excess of demand versus offer and hence inflation. The surrogates of self-affirmation tend at the same time to prevent social justice, both within a nation and between nations, offering again a surrogate for it : economic growth.

Finally : consumption and possessions as yardsticks of man means that man himself is feeling to be consumed as well, constantly menaced to be thrown away and substituted, never sure of his role and value.

What can one expect from such premises than : youth unrest, old age misery, social trouble, political conflict, alienation, environmental destruction, urbanistic anarchy, crime, dope addiction, hunger and cultureless wealth. Even the demographic explosion in the so-called indeveloped countries as well as in the lower stratum of the overdeveloped nations can be explained by this.



For the poor wretched, one of the few ways if not the only one of self-affirmation is procreation; the sexual act itself meaning on one side domination and on the other the rather pathetic acknowledgement of being "chosen" And all this leading to the existence of beings which in turn can be owned and dominated, sometimes loved, by even the most miserable. And finally : procreating means for many the only way of achieving a reasonable (or rather unreasonable) security against infirmity and old age. Needless to say that such conditions are apt to reckless exploitation by the privileged who themselves are ensnared in a race without a final goal, possessed by the drive to possess, to possess more : things, wealth, power.

The lack of absolute values as basis of self-assurance and self-affirmation is common to capitalist and socialist countries as we know them today. The mentioned plagues are to be found everywhere, if in different degrees. They are symptoms of a deep-lying general syndrome, "treated" by ever increasing doses of anesthetics: consumption, distractions, fata morganas, and scapegoatism. This syndrome is not amorphous: it has a pattern, an inner logic and a structure. And it has an elementary force behind it which is as old as Creation. New is only the planetarian dimension of its menace.

What seems to be desperately needed is a collective catharsis, a cultural revolution as some may call it. I call it a brainwashing in the good sense, our brain being the dirtiest part of our body (In this context I am not at all thinking of pornography which is to my mind more ridiculous than dangerous). The brainwashing

I am thinking of, does not - differently from the common understanding of the word - put other dirt in; it finally reveals the structure and colours of the eternal tissue woven by God to His image; structures and colours which ask for being developed and deepened, not dyed and over-printed.

## 5.2. The Resistance Combatants

Let us not fool ourselves. The enemy is strong and in control. Those who fight him are too few and not powerful enough to deliver open battle. What is possible right now is to organize resistance, to help the lonely combatants to find each other, and to mobilize the comprehension of the people that this fight is in their interest.

Who are these lonely wolves and what are their chances of being understood by the people? The answer <sup>to the first question</sup> is simple. All those who do not conform with the general motivational pattern of the present societies, are resisters: the worker-priest; the asylum nurse; the student risking his health in a demonstration for other people's rights rather than hurrying into a high-paid job; the circus clown; the working communes; the Club of Rome executive; the writer earning his life as a nightporter. Saints, lovers, wise men and artists. Those who refuse self-affirmation by surrogates. And young people not or not yet caught in the mill, being privileged in that the deforming power too needs time; but they are also among the most vulnerable to the Big Lie as they need self-affirmation more badly than their seniors.

What does this heterogeneous lot of scattered combatants need more than communication among each other? A common language accessible to all classes, nations, ages; simple, profound, powerful. Which could be art : novels, caricatures, folksongs, Kienholz' environments; and the example of those whose life has become a piece of art in its truth and wholeness.

As to the chances of comprehension by "the people", there is room for moderated optimism. As a matter of fact, General Trönd is puzzled : there are limits to the conditioning of his soldiers! Mistrust of the institutions, of army, science and business is a fast rising phenomenon. To be called a specialist is not any more a straightforward compliment, neither to be called a "well adapted young man". Yes, there is some hope.

### 5.3. The Long March

There is hope but the fight will be long and the outcome is uncertain. The power machine is still functioning, and controlled by the syndrome sick. A long march is needed, our weapons being far from deadly. They denounce hypocrisy, ridicule pompousness, fight alienation. But they do not kill. On the contrary. They help to live. Which takes much more time than a bullet.

Hope for victory, for reaching an equilibrium society of spiritual development, means hope to find absolute values. But can they be invented? Certainly not. Need they be rediscovered? Not even. They are here and they have been here all the time (as they will be till the end of time). They just need to be affectively communicated. Or in the language of telecommunication technology : the problem is the signal to

noise ratio. There exists too much noise to get the message through. And what makes things even more difficult, is that in addition to the random noise of meaningless signals there are the interferences emitted by the enemy.

What we need are selective filters identifying and denouncing the noise as what it is : a meaningless background phenomenon or the deformation of the signal. Need I say where such devices might be found?

There are people, however, who pretend that the prize of victory were not worthwhile, that a world in equilibrium were boring to death. They consider (or pretend to consider) a sharks' world much more entertaining. This is perhaps a question of perspective. It seems questionable to me whether the present sharks' world is equally amusing for other animals than sharks. Even the silent majority of carps disguised in shark-skin may not be too happy in it.

As to fun : we know that there can be no end of real fun, other than soldiers' entertainment and ostentative prestige amusement. There are discovery, invention, and learning, there are sports, and games. And there is art.

I confess to be sceptical about the probability of reaching this harbour of harmony on Earth. But I consider it my duty to fight for it as if it were feasible. As William the Silent, after a heavy defeat in battle, said:

I have never needed hoping in order to undertake  
Nor succeeding in order to carry on.

ART AS AN INSTRUMENT OF SOCIAL FORECASTING

by Carlo Virgilio  
TRADES

I. Artistic endeavour is an essential component of social development. The most recent analyses and studies of the art phenomenon to explore the diverse modalities, motivations and intentions of those who create and enjoy (and more often "consume") art, show repeatedly how all developments in social evolution are inseparable from artistic activity and vice versa.

From a conditioning (especially for Italy) idealistic analysis, which heretofore virtually pitted the social and artistic processes against each other, we have come, in the wake of the structuralist, sociological, anthropological and more generally Marxist theoretics, to consider the millennial relationship between the art and social spheres in its rightful, realistic dimensions.

Everyone, even the man in the street, is now well aware of this bond. Nevertheless, as so often occurs with fashionable theories, this one is also now accepted but without critical standards; moreover, on the various levels of consciousness, it is being utilised and probed without any serious effort being made to verify its accuracy.

Today's studies and analyses thus undervalue a phenomenon which characterises artistic activity in a more qualified way, in relation to the problems of social evolution, than the simple reciprocal conditioning relationship, by which we mean the forecasting possibility of artistic endeavour, more real today than ever, even though that possibility is sparsely utilised.

II. Oftentimes intellectuals and scholars dedicated to a creed or an analytical methodology become "more realistic than the king". This is true of those who, speaking of the art-society duality, forget that Marx himself, who was altogether convinced of the conditioning links between the two terms, declared that "... there are periods when artistic development is extremely intensive. These periods have no direct relation either to society's general development or to the material base and structure that comprise its organisation."

This declaration strikes us as altogether acceptable (indeed, Marcuse endorsed it in a recent work when he attempted to identify the subversive possibilities of the artifact), especially today when art, by virtue of an inherent logic, eludes the omni-comprehensive scientific and technological system which affects every phase of common evolution. Indeed, by comparison with such "logic", it appears contradictory, critical in its attitude and contestatory.

Although utilising the technique, technologies, propositions and orientations of contemporary science -- broadly now, more and more extensively in the future -- in reality, art is conducting a dialogue alternative to science since, being unable to withdraw from the prevailing technological system, it hypothesises, emphasises and often realises an ideal construction of that system; in short, it constitutes the model. This is the contestatory phase in which art departs from the dominating social reality. Since art is rooted in the qualitative, it rejects the machine-made and the quantitative which our contemporary economic system imposes on technology and its uses. In art, the practical quantitative factor is reduced to zero; the art object becomes a unicum. The ideal factor, proposing the idealtipus, today creates an artistic output justly and significantly defined by some scholars as "projectual".

In this projectual action of the artist, we find confirmation of Marx's doubt. Art is not always or only conditioned by the social context. And in the projectual operation, it can surely anticipate social development itself, at least on an ideal level.

III. Art has always functioned as a forerunner of future life modes. Looking back, we can see how the 15th century Renaissance in Florence, for example, foresaw and influenced many of the social conditions which were not to appear in other parts of Italy and Europe until the 16th and 18th centuries; such examples are innumerable. While this previsionary value has never before been recognised, it has now been finally acknowledged that art is eminently suited to the role of forecaster, and that it can be fully utilised in this capacity.

By virtue of a complexity of situations, some of them explained in the foregoing, art today can guarantee this ulterior boon to the social awareness of its contemporary era. In substance, the function of futurology and forecasting is an organic product of artistic impulses which form, express, realise, analyse and offer up reality. This function is not separate from the others art can assume -- merely representative, communicative, psychological, transfert and cathartic. On the contrary, its forecasting power ensures these functions a greater potentiality and clarity in their attainments. Drawing on these general motives and others, more specific, which we shall subsequently discuss, today we can speak with theoretical (and, where necessary, empirical) confidence of art as an instrument of forecasting and an indispensable complement to man's study of the future.

IV. Man has always been concerned with his own future, he has always made projects for the future and programmed his future actions. To think of his own future is as natural as thinking of the future of his family, his children, the group he belongs to and, where a mature intelligence is involved, the future of all society. The development of technology and, even more, of cybernetics has provided this forecasting instinct with instruments suitable to achieve this purpose more rationally and with greater possibilities of historical verification. Computers, broadening the human mind's capacity, can collect and correlate a growing mass of variables, and thus

enable man to expand enormously his range of forecasting activities. From short-term forecasting, restricted to the human mind's natural possibilities and circumscribed to a narrowly limited period of time, we have now moved on to medium-and long-term forecasting through the development of cybernetics. Already we are projecting as far ahead as 80 years -- the life span of a man. To be sure, these technological possibilities and forecasting instruments have not created a future but rather, to quote Popper, a "programmed historicity;" in other words, futurological research is being centred mainly on the interpretation of the present projected into the future, thus magnifying and institutionalising the limits of contemporary human comportment. Often, in fact, this research has been deliberately intended to impede the future -- to avoid crises, damaging changes, etc. -- rather than to promote it.

Thus, it would appear urgent to introduce a new factor into forecasting analyses, man himself, and a new dimension, imagination. To achieve a different and better society, we cannot think only of economics, technology and such matters; we must observe new values, new ways of collective living, we must understand man's real needs as he changes and grows, and hypothesise alternative models which are better adapted to such needs for growth. To this understanding, we must turn first to the artist, whose work, for its indispensable esthetic intentions, its philosophical evaluations, communicative efforts, formation, definition, has always held man, consequently the quality of life, as its point of reference and provided invaluable material in terms of future indications.

V. Picasso used to say that the artist lives in the future; therefore, he added with a touch of irony, it is right for him to surround himself with objects of the past. Thus he justified his own passion for antiques.

His comment strikes us as right and pertinent, not in the absolute sense perhaps -- there are cases in which a return to the past has been the most cherished objective of some artists --



but certainly it is true of the contemporary artist.

The contrast between industrial and artistic production -- the machine-made product and the unicum -- which we have mentioned; the projectual contents (in the most advanced works) ~~detectable~~ in the artifact, representing the critique of a prior type and the hypothesis or prototype of an ulterior type; an intimate, "subversive" potentiality in the very nature of art; and the transmutation of the specific historical universe into art -- all these factors open up another dimension to constituted reality: possible liberation. They render the artist's work utilisable for forecasting purposes and for "inventing" a future social reality.

At this point a doubt may arise. In this evaluation of art's potential forecasting possibilities, hence constructive, capacity -- which presupposes that the artist possesses specific qualities not easily found in other social or professional pursuits -- could we be nurturing, perhaps subconsciously, an idealistic prejudice that the artist is closer to the spirit than to the material? (prejudice which we have already mentioned). Although altogether understandable, this doubt is unrealistic. Underlying the positive evaluations of the role of art and the artist in social forecasting, there is indeed an analysis of an essentially sociological nature. Actually, for thousands of years -- but chiefly since the Christian era -- the artist has always worked in a particular climate of creativity, although within the limits of an extremely serious, constraining and determinant conditioning, whether ideological and cultural or technological and operative. Moreover, he has always been considered, especially by himself, the legitimate possessor of this spiritual activity. De facto, in a situation which does not, as a rule, reward the repetitive but rather the innovative, this has given rise to a psychological disposition, hence to a highly special sensitivity because it is oriented toward research and the interpretation of the new which, better than anything else, can provide a useful basis and a disposition best adapted to research and future projecting.

But some scholars, Mannheim for example, go beyond this hypothesis and consider intellectuals a privileged group in social determination. Artists, they say, are less influenced by their class origins than other social workers, both because of the specific nature of their work and a sort of class indifference when they are considered a category apart. This class indifference affords the intellectual and the artist that wealth and mutability of attitudes that provide them the fundamental presuppositions of a mental process which is not only autonomous but also alternative and creative.

Actually, an analysis conducted on this basis does not strike us as a wholly acceptable, mainly because of the class concept attributed to artists and intellectuals as a clearly defined entity. This "one-ness" is usually anything but homogeneous. It overlooks the fact that there is no real circulation of ideas among the different intellectual and artistic specifications, and that relationships are limited to somewhat generic imitative phenomena. Moreover, it overlooks the fact that often, particularly in the advanced industrial societies where an intellectual category can establish itself and live by its own work, intellectual output is specialised in reference to the demands of a public which differ according to the various social classes. Finally, who can concretely evaluate the influence exerted on the intellectual -- in terms of behaviourism, political, operative, esthetic, expressive and communicative preferences -- by his class of origin? As for the claim of class indifference, we need only remember how often political and class attitudes ~~have~~ substituted -- particularly in architecture -- merely formal and esthetic thinking and research.

In any event, in highly industrialized societies where, as we have said, the intellectual can live from his work (unlike the less advanced countries, where the intellectual who lives by his profession is a rarity, usually a member of a wealthy family with an income from other sources), we can easily see that he has been uprooted from the social context. With his work, his ideology and

his esthetic utopia, the artist proposes a discourse alternative and antagonistic to the values and basic tenets of the industrial society. (There is no doubt that the more or less exact perception of this alienation equally unites the entire intellectual group, which can be set apart as a category of its own, if not actually a class, because of the common approach to means and perspectives it adopts to combat that alienation.) His participation in a category gives the individual greater freedom of action (the socially independent intelligentsia, according to Alfred Weber) which, in a world hostile to the artist, is inevitably channeled into activities to exorcise and safeguard utopia and prophecy in a return to the magic-mythical origins of art.

VI. In reality, in the present era, the greatest demand -- arising from the need for survival on all moral, psychological and physical levels -- is to rediscover the prophets. The linear development of our mechanical, intimately inhuman civilisation, can be restrained, corrected or effectively blocked only by dynamic prophetic activities which can orient our decisions and values in the right direction. The individual's psychological position could be re-considered, not so much as an element dominated by mechanisms and repetitive instincts concerned with survival as the sole purpose of life, but rather, in a Jungian perspective, as the very foundation of transformed ulterior psychological attitude toward man's existence as a project to be realised. In other words, man must re-discover and re-consider the urgent need to rebuild what Mannheim called the "Utopian mentality."

Utopia differs substantially from ideology, indeed it constitutes its antithetic concept. Ideology implies the impossibility of transforming the economic and social structures it prescribes, and therefore supports a conservative function. Utopia otherwise strives for effective change in the real world, creates new forms of society and patterns of behaviour, establishes original values and offers a "city-of-the-sun" hypothesis. "The disappearance of Utopia,"

Mannheim points out, "brings us to a static condition, reducing man to nothing more than a thing."

To speak of Utopia in an era of hard-cash neo-positivism and rising productivity can bring discredit upon it and provoke smiles. Utopia connected to fantasy, is still in danger of being stamped as an unproductive concept, a mirage or, in a more acute analysis, a release from history's dialectic process, hence a "flight into the future."

Being a forma mentis and an organised activity, utopia fully responds to certain demands of social forecasting -- those which necessarily take recourse to the use of imagination and creativity. Nor can Utopian activity in itself be dismissed as a "flight into the future". Even at the source of Gramsci's thought lies the Utopian element. It is filled with that expectation and prophecy which typify the charism and ferment of every collective movement in its statu nascenti, seeking advancement by rejecting current petrification in the name of humanity's universal rights and reasoning.

Well-disposed toward utopia, the mathematician de Finetti wondered, "What are the reasons why every utopian reasoning and project are so unpalatable to the majority of people? Basically, it is inveterate laziness and the force of habit which make the most obvious and absurd monstrosities acceptable to them because they are accustomed to them, while the soundest and most reasonable propositions are rejected as inconceivable and ridiculous if they resist the idiocies sanctified by the patina of time as taboos; and because it is following a senseless direction, humanity becomes reduced to an obtuse herd of sheep, bereft of will."

VII. Projectism, or the artist's projectual work which becomes programmed art, retains a powerful Utopian charge. It puts its roots down in a more or less rational hypothetical truth -- one reason why it is still in a pre-or para-scientific stage -- to ally itself with scientific activity, social criticism and imagination. Certainly, society's evolution cannot be turned back to any rigorously logical

process, nor can it be defined by principles established a priori. Nor could a formalist, intransigent, conformistic morality, totally lacking in impetus, derive from it. But Utopian activity is not a rigorously logical process, nor does it constitute an apriorism in social evolution. Indeed, this is the role played by ideology which, as we have said, appears by comparison with Utopia to be a broadly conservative activity, substantially incapable of changing the social and economic structures to which it is linked. Utopia, on the contrary, establishes free, original values though joined with the cyclic, dialectic processes of history. When utopia draws progressively closer to the real life it once completely transcended, it encounters an antithesis which transforms it into a conservative activity, forcing it to lose its inherent power of innovation. But the cycle reopens and makes room for a new utopia to rise, with its radical alternatives and avantgarde propositions. In what context these propositions will be framed and what will be the real value of their innovative power is very difficult to prefigure.

VIII. Today, and this is well known, many currents of serious thought are speaking openly of the end of art and, consequently, the demise of the artist. Asked whether there is any possibility of predicting what art movements, currents and works will face future art historians, G. C. Argan replied, in a recent interview, "It will be an apocalyptic delirium. But I believe there will be no more artists or art historians. The ultimate survivors will study Picasso and Pollock as relics of a vanished civilisation." We may have to agree with this prophecy, although apocalyptic, but we still must agree on what artist's figure is and <sup>on</sup> what genus of art we should focus our attention. Certainly, the artist in the future will move further and further away from the artist of today and, presumably, much closer to the scientist and technician. The single art object created for a limited public, even in a projectual form, will have lost its erstwhile efficiency and its raison d'être in a society what will no longer have radical cultural balances; thus it would only be

useless and "reactionary" in every respect.

Perhaps future art par excellence will be urbanistic. The great expressions of painting and sculpture as we know them traditionally and which still are important forces, in all probability will no longer exist. Perhaps it will no longer be possible to speak of painting at all, since this art form, under its technical profile, will certainly be something different, neither sculpture nor design. Thus, it will perhaps no longer be possible to speak of artists. In any case, the artist -- or better, the new social figure who will replace what we now call the artist -- can and must reach the world around him on a more global level. The single object will become no more than pure decoration or a product of craftsmanship -- assuming, of course, that there will be an acceptable significance for these forms.

New technologies will enable the artist to achieve creations not possible in traditional forms. Every work of art will be resolute to a human problem, it will develop and reinforce man's capacity for understanding, it will show him clearly what he needs, in a language which tends to be universally common.

Ambiguity, obscurantism, ermetism and the difficulties of reading and comprehending works of art, which still today fascinate us so much and make us feel in harmony with the object and therefore attuned to the spirit of the man who has created it -- certainly with much anguish and an impassioned, tumultuous creativity -- will be only a memory (probably recalled in some archaeological manual) of a civilisation still incapable of expressing or realising itself in a truly constructive language.

But if the future of art is as inscrutable as every other future, the fact remains that some part of artistic expression is already living in the future of contemporary culture. Not a few artists, oftentimes in diverse fields such as education, science, technology, etc., have had anticipatory, and sometimes conditioning, visions of the social future, and since the bonds between art and society result from a continuing process of interaction, even when

the artifact precedes in time the very culture it represents, we are convinced that an adequate reading of it -- conducted in a proper perspective of methods and objectives -- can offer, as we have already said, considerable help to the interpretative efforts of social forecasting.

*CONFERENCE PROCEDURE*

**GROUP 5**

**The participation of all people in  
physical and ecological survival.**



THE PRISONER'S DILEMMA AS AN OBSTACLE  
AGAINST EFFECTIVE ACTION

By Gerhart Bruckmann  
Professor,  
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Hundreds of excellent analyses' give a thorough diagnosis of the threats of today and tomorrow. Other hundreds of excellent analyses' tell us what should be done. They culminate in statements like "water pollution must be stopped", "we must achieve more equality of incomes" or "we need a new ethics".

For an outside visitor to this globe, it must seem strange that in spite of all these overwhelming and unanimous voices water pollution goes on, inequality of income distribution increases, and the more we call for a new ethics the less of it there is to be seen (highjacking and Mururoa represent some fine recent additions to the ethics of so-called homo sapiens).

As stated above, hundred of papers deal with the question "what will happen if nothing is done" and "what should be done". However, if we wish to satisfy our outside visitor (and, incidentally, if we wish to survive), two more questions must be tackled: Why is it that nothing is done? and : What concrete actions could be taken?

As compared to the pounds of papers devoted to the initial questions, the weight assigned to these two questions doesn't even reach ounces. And yet, they represent the switches for the tracks into the future. Concrete actions will not be taken as long as we do not know enough about the obstacles against them and how they can

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be overcome.

These obstacles, as they have been analysed (mainly) by Yehezkel Dror, Dennis Gabor, Bruno Frey, Harold Linstone, can be boiled down to two main roots: One, an incorrect assessment of the future, and second, the prisoner's dilemma.

As Harold Linstone gives an excellent analysis of the first (cfr. "On Discounting the Future", Technological Forecasting and Social Change 4, 335-338, General Number 74 of this conference), I shall devote the following lines to the second aspect.

The prisoner's dilemma represents a situation in which rational behavior of the single individual leads to disaster for the group. A few examples: The Venetian merchants cut the logs for their ships in nearby Dalmatia. Each single shipbuilder would have gone bankrupt if he had treated the Dalmatian forests more carefully or would have imported the logs from farther away. The result of their combined optimizing rational action, however, is the naked rock of the Karst mountains.

The much-quoted analphabet in a povertystricken area optimizes his prospective old age security by having as many children as possible. He witnesses convincingly from epirical evidence all around him that old people with more children are better off than old people with fewer children. The result of the combined action, aggravated by modern medicin, is a population explosion that exceeds the increase in (agricultural) productivity, reducing the survival basis for all.

The single house owner optimizes his situation by not installing in his chimney a costly device to reduce air pollution. It is important to observe that this behavior is optimal both if a) all other house owners would install the device and if b) no other hose owner installs it. The same applies to car-drivers, car-manufacturers etc.etc.etc.

It is even more important to observe that this type of behavior is not to be attributed to ill-fated capitalism (the same applies, mutatis mutandis, to socialist countries and to the Third World)

nor to a general moral defect of animal man. It is simply the result of a socio-economic system that rewards egotism and punishes altruism.

Logically, there are two ways out: To change the system, or to change the rewards.

It has become extremely popular to call for a change of the system. For several reasons, this seems to me the second best solution.

One, systems tend to have a tough life and concentration of efforts upon fighting the system (thereby neglecting other urgent work) might result in a complete failure plus a terrific loss of energy. Second, even assuming that after a long struggle the system might have been changed, it might meanwhile have become too late to save the survival basis for mankind. Third, history has taught us that whenever hardships and insufficiencies were attributed to a social system and the system was changed with blood and tears, the same hardships and insufficiencies would soon reappear, usually worse than before.

But how about changing the rewards? Before answering this question, let us first analyse instances in which it has been possible to overcome the prisoner's dilemma.

The Wörthersee, a famous resort lake in southern Austria, was in great danger to share the fate of Lake Erie. Each single hotel-owner, each single community around the lake optimized their behavior by dumping their sewage into the lake. It took some time before they realized that the combined "optimizing" action would soon drive them out of business. So they got together, raised the substantial sum necessary and had a ring sewer built that saved the lake for swimming and recreation.

Another example: Every driver optimizes his situation if he has the right to park his car in the center of the town for as long as he wishes. The result: He has to get up maybe at five o'clock in the morning and drive downtown in order to be ahead of the other ones also wanting a parking lot. The way out: A complicated

(still ineffective, but at any rate better) system of different zones, parking meters and the like.

A third example: When surpluses of farm products in the U.S. threatened to result in a breakdown of the market a system was established to pay farmers for letting land idle. (whether this is a sound policy for other reasons is not of relevancy in this connection).

Why is it that these problems were solved whereas many more urgent problems, like the pollution of the oceans, have remained untackled?

When we compare the Wörthersee-problem, the parking zones and the farm subsidies to the pollution of the oceans, we find that the solvability of the prisoner's dilemma depends on several dimensions:

1) The size of the problem

All else being equal, the solvability decreases with the number of (independent) decisionmakers involved.

2) The transparency of the problem

All else being equal, the problem will be the less solvable, the less transparent the relations <sup>between</sup> present behavior and damaging results are. The chemical industry of the United States exporting DDT to Third World nations will admit far <sup>less</sup> that they pollute the oceans than is the case in the Wörthersee example.

3) The size and immediacy of the threat

All else being equal, the problem will be the less solvable, the less the impact of the threat is being felt. In the parking lot example, the negative result is not pernicious but immediate; hence it finds a solution. In the Wörthersee example, the threat is somewhat farther away, but it is a substantial threat: Tourism might break down and drive people engaged in it out of business. In the case of the oceans, the impact is not felt.

4) The organisational level

All else being equal, the problem will be the more solvable, the better the organisational platform, be it an existing one or one to be created. It will be easier to solve such a problem within the

"association of Wörthersee communities" than to solve a similar problem amongst an (equal) number of firms from different branches, or, in the case of the ocean, different industries from different nations.

Any attempt to solve a particular problem of this earth in which the prisoners dilemma plays the dominant role, will, hence, have to proceed along these dimensions.

In most instances, the size will be given and there will be little that could be done about it (e.g. to break the problem down into subproblems of smaller size). Much, however, could be done along the other lines. In order to be solved, a problem must be made more transparent to more people. In many a case (in which the problem was not too big), the mere increase of transparency resulted in a "citizens' initiative" strong enough to reach the desired goal and to force industry or the government into proper action.

As to the impact of the threat, it might help to demonstrate it by (artificial or real) examples. Pollution of Lake Lugano has upset other lake communities much more effectively than theoretical analyses by Limnologists.

Main emphasis, however, must be given to the organisational dimensions. In spite of transparency and impact, no results will be achieved as long as the organisational dimension is being neglected. As has been shown by others (Bruno Frey) and as I outlined above, national laws or international agreements will have hardly better effects than general appeals to higher moral, if reward to egotism and punishment of altruism remain unchanged. The example of farming subsidies shows clearly that the rewards need to be changed, not the system.

In place of a theoretical description, let me give another example. It is well known that a substantial part of the pollution

of the oceans is to be attributed to tankers dumping their oil wastes into the sea. To try and prohibit this dumping by starting to pass national laws or <sup>to</sup> reach international agreements will be much more dubious than to change the reward system. The price for oil being as high as it is, it would be worth it to raise it by another few cents per ton to establish a fund from which to buy oil wastes and collect them at the port of discharge. The price per ton of oil waste should be just high enough to render it worthwhile to "sell" oil wastes rather than dumping them into the sea. Furthermore, it might well be the case that the ingenuity of the chemical industry develops soon a technology to make profitable use of this oil waste, thereby not only saving scarce resources but also enabling a reduction of the levy from which the fund was created. So the problem would, essentially, boil down to the question: Will the oil producing, transporting and consuming countries be able to establish the organisational platform for such a procedure?

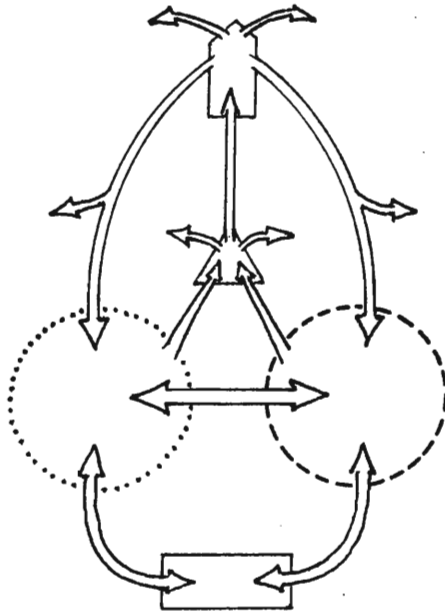
Instead of devoting efforts to the construction of consistent utopias, dystopias and eutopias that will never come into existence as they lack any link to reality, much could be done if we set ourselves a more modest goal: To discuss and pick out a few of the main problems endangering the survival of mankind, to analyse them thoroughly and try to establish a workable solution within the realm of reality - if it were for no other benefit than to have gained some time to catch breath on our race into the future.

## Metascientific Research

A proposal for a demonstration effort to evaluate "research on synergistic research" as an organizational methodology for promoting scientific R<sub>x</sub> evolutions<sup>1</sup> in the understanding of the complex dilemmas characterizing biomedical-behavioral-environmental phenomena in contemporary society.

Prepared by

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<sup>1</sup>Revolution in a Kuhnian sense extended to imply the survival value of the design or prescription (R<sub>x</sub>) for further evolution.

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This paper was generated as a consequence of (1) a request for ideas from the Task Force on Research of the National Institute of Mental Health and (2) as a potential contribution as a background paper for the 1973 Rome Special Conference on Futures Research on "human needs, new societies, supportive technologies." The views expressed in this are solely the authors; they in no way imply policy agreement by the National Institute of Mental Health or any other organization.



## Foreword

Reductionism circumscribing conceptual attention, institutional compartmentalization of type and scope of effort, and hierarchical administration have proved to encompass efficient strategies for creating discrete ideas, products and services. Implementation of these strategies, whether by normal science, industry, or government, represents an evolutionary stage of organization of life. The historical record reveals that every level of achieved organization is ultimately superceded by a new pattern of structure and process that incorporates portions of former organization with emergent structures and processes to provide increasing awareness and responsiveness of the systems involved. Such evolutionary phase shifts open up new avenues of expression and experience while enhancing fulfillment of both retained needs and those created by the reorganization of relationships.

As is now becoming widely realized, the earth is now involved in an incipient evolutionary phase shift unmatched in magnitude by any prior ones. Its accomplishment will involve major changes in values, purpose, policy formation, and institutional organization -- all in the direction of increasing the synergistic interrelations among ideas, people, and organizations.

If we are to maintain options for adaptation and development, we must accept as a guiding precept a recognition that the consequences of projected actions can never be accurately predicted. Therefore, we need to seek patterns of organizing our communication and effort which maximize discovery of those insights about complex interrelationships whose recognition will enable change of purposes and their implementation. That is to

ay, we need to foster those capacities and means for self-organization which insure evolutionary growth. Ultimately, economic growth will become a relatively subsidiary aspect of evolutionary growth.

Science in the sense of intellectual inquiry, and application in the sense of user participation in the utilization of the fruits of inquiry, represent two domains of human involvement, with regard to which augmentation of capacities for self-organization and re-direction will foster successful realization of the impending evolutionary phase shift. Science becomes metascience when its organizational patterns of pursuit permit: (1) planned collaborative effort among usually isolated areas of endeavor; (2) sustained interaction with potential users; (3) development of a prosthetic brain to facilitate creativity through man-machine selection, condensation and interrelation of information; and (5) a continuing monitoring and evaluation of the ongoing process and product of this network.

The text of this paper, through graphics and verbal description, outline a model for creating metascience. It utilizes as an exemplary setting for such a transformation the institution and agency within which the author works. This exemplification in no way implies any agreement with these views by the institution and agency concerned, nor does it imply any intent to implement these ideas -- they are solely the personal views of the author.

John B. Calhoun

20 June 1973

i. Proposition and Intent:

Normal science's success in producing new insights now diminishes their utility for understanding complex biomedical-behavioral problems in contemporary society. Resolution of this dilemma requires a new level of organization of research which can extend the strengths of normal science. The present proposal seeks a rational practical means for developing such a metascience. To be successful this metascience must satisfy at least three criteria: (1) It must be capable of producing creative insights about large complex aggregates of many individuals; (2) these insights must have utility value for application to real-life bio-social systems; and (3) the cost per unit of research product, in terms of its potential utility, must be less than those from normal science. That is to say, metascience must be both more efficient and more effective. A generalized strategy for meeting these criteria and objectives will first be described. Then it will be interpreted with respect to implementation as a short-term goal (5-10 years).

ii. Historical perspective:

Three quite different, and equally ancient, traditions contributed to the human endeavor we now term science. First, the very survival of primitive man demanded intimate familiarity with nature. Observed regularities and relationships served as guides to judge the time, place and likely success of future action. Naturalistic religion emerged to justify and codify ("explain") events. From Pliny through Darwin and Aristotle through Newton these traditions matured into natural history loosely wedded to philosophy -- both concerned with developing orderly rationales for the multitude of processes in which living and experience are imbedded. This perspective of life culminated in taxonomy and the theory of evolution and natural selection, which coalescing with other threads of natural

history produced the contemporary discipline of ecology as a matured perspective of complex interdependencies that permits logical manipulation of nature rather than just enhancing capability of accommodating to its contingencies.

Second, early in history the power to manipulate led to empirical technologies for surmounting practical problems encountered in every day life. Through role specialization, trades and guilds arose; each with its protected and transmitted knowledge and skills required to accomplish some limited set of tasks. Empirical mathematical rules and theorems gradually emerged to provide precision in executing specified technological goals. Far before the emergence of modern science, this tradition of establishing patterns of action, based on practical experience, culminated in very efficient engineering practice, including surveying.

Third, there remained a sphere of experience outside any expectation of ever making direct contact with its components or influencing their course. The heavenly bodies exhibited either static spatial relations with each other or changed positions in conformity with recurrent patterns. Describing static relations and developing means for predicting (i.e. theory verification) recurrent patterns provided a greater sense of one's being in the world. Such effort encouraged development of complex mathematics, largely divorced from the practicalities of day-to-day life. Throughout history such classical inquiry largely remained separate from the practically oriented second tradition.

By 1590 Bacon, motivated by a desire to see how parts of nature responded to new conditions and utilizing the practical methodological strengths of the guilds, established the rudiments of experimental science. However, due to Bacon's suspicion of mathematics and the institutional separatism of classical, physical and mathematical inquiry, little interaction between the second and third traditions occurred for another two centuries. Between 1800 and 1830 an institutionally forced

merger between these two traditions took place at the École Française and spread to Germany, and thence throughout the rest of the world, to establish science in its contemporary dominant form. (Kuhn, 1972)

The exploitation of science's power to develop new insight has led to specialization and fragmentation of effort, the reductionistic molecular approach in which small aspects of a whole are treated out of full natural context. This fragmentation is reflected in the proliferation of educational and research departments, scientific societies, and journals. On the positive side this direction has facilitated growth of technology to meet human needs. On the negative side, society and nature have become so complex and interdependent that alterations introduced to produce specific positive impacts often have secondary and tertiary deleterious consequences that override or cancel out the intended positive ones. This is a core issue in the current crisis in science.

As this crisis has been emerging, other changes in science have been taking place which can resolve the crisis through making possible a metascience. These changes all concern information processing. They include: information theory, systems theory; the ecological perspective to information flow; brain function; computer technology and other mechanics of information processing; understanding of creativity; behavior development; dynamics of social groups and institutions; theory of decision-making and value change; and an appreciation that the evolutionary process encompasses biology, culture, and technology. In essence, we now stand in a state of readiness to utilize these understandings of information metabolism to unite all three historical traditions of science to create a metascience capable of drawing together the semi-isolated strengths, insights, and methodologies in ways that will permit inquiring into those complex problems facing society today.

Just as modern science did not arise until an external pattern of institutional arrangement forced and enabled the union of two of the three previously separated traditions of inquiry, so now we may not expect the origin of a metascience, which embraces all modern expressions of the three traditions, unless strong institutional encouragement and protection is given to its promotion. This paper proposes the rudiments of a methodology for producing metascience. As will be seen, the term "metascience" has the additional implication of research on research. Due to its greater complexity from an information processing point of view, metascience as organization and methodology can not be expected to evolve without simultaneous and continuous research on it as a dynamic process. What follows is a schematic description of the minimum effort required to establish a single unit of metascience. It should have general applicability to all spheres of human activity concerned with creating and applying insights.

### 1. Element No. 1, Core project

A core project (Fig. 1) is characterized by a definable network of concepts, problems or objectives (3 to 13), the understanding of any one of which will likely assist in the understanding of the others. The term "core" is here used in the sense of the basic element of organization of meta-scientific research. Furthermore, priority of selection of objectives to be pursued should be based on the magnitude of the experimental design matrix practical to pursue. That is to say the majority of the project's efforts should be more elaborate than the 2-cell, single variable, control versus experimental. To begin to go beyond normal science, experimental designs must include at least 2 variables (i.e. 4 cells), and preferably more. In like fashion the assembly or systems focused on should gradually increase in diversity and number of elements so that extended repercussions of variables may be determined.

The effective number of personnel for a core project may be set at 19 - 7 in research (R) formulation roles and 12 in supportive (S) roles. The majority (11; 3R & 8S) would be expected to be the members of a group given named status and budget within the normal hierarchical research and support structure. All such majority core project members should spend between 75% and 100% of their time in core project functions. However, the breadth of core project objectives makes it unlikely that all of them can be accomplished through the efforts of these majority members alone. The needed extra scope and freedom can be provided by a legitimization of formal participation by interface with individuals (4R, 4S) who are otherwise members of other research groups (i.e. allied projects).

### 2. Element No. 2, Allied projects

An allied project (Fig. 2) represents a focus of research endeavor, some portion of which can be fulfilled in conjunction with a core project's effort. Usually an allied project will

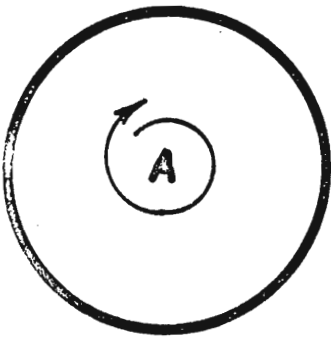


Fig. 1 Core Project, A

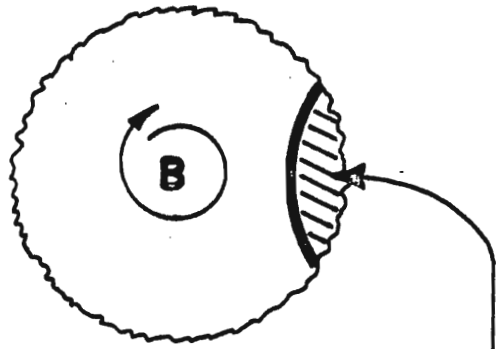


Fig. 2 Project allied to A's objective, B

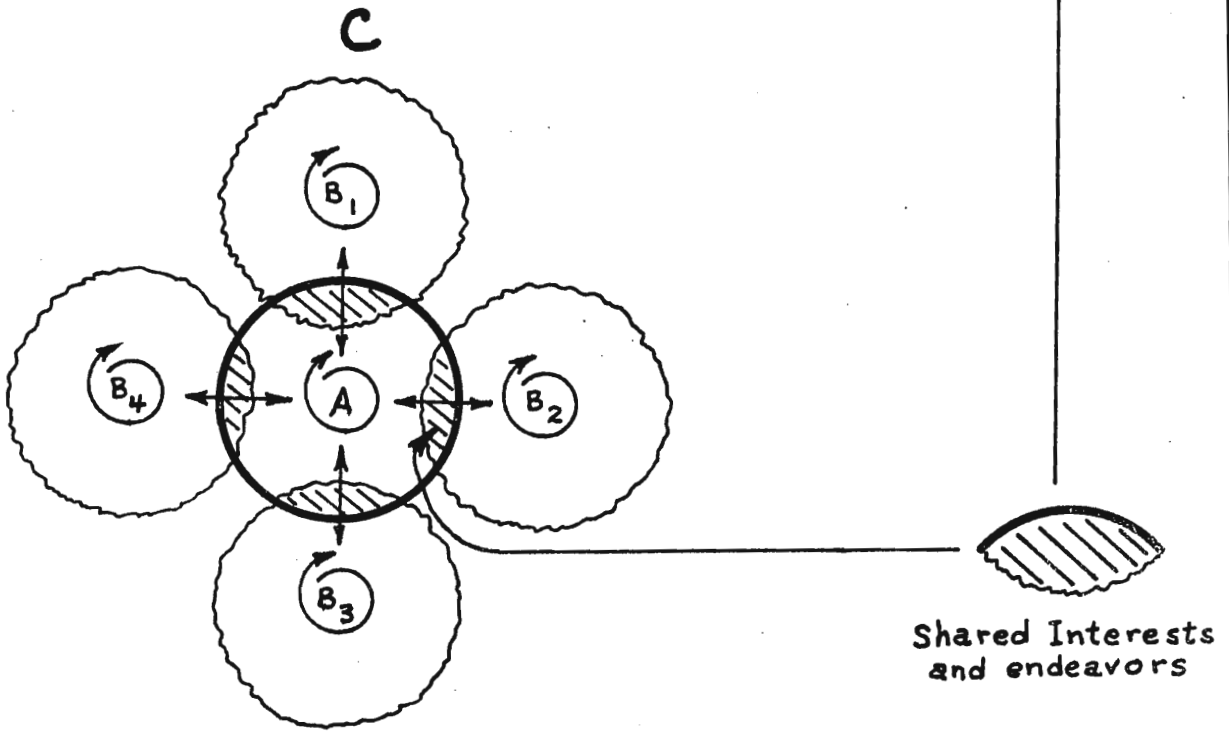


Fig. 3. Project Constellation, C

 = Internal information flow and transformation

 = Information flow across interfaces



be one of the mainly normal science units with recognized prior accomplishment. Any such overlap provides the opportunity for some aspect of the core project's effort to be pursued by an individual who maintains those close contacts with other members of the allied project in ways that will be stimulating to the successful accomplishment of efforts related to the core project. Each such overlap (interface) with an allied project should include two persons (1R, 1S) who devote more than half their time to the associated core project objectives.

### 3. Core project: Allied project integration (Fig. 3)

Assuming that the average core project will overlap at least four allied projects, then the distribution of core project personnel will be:

Role	In Core Project Proper	In Allied Project	Total	Allied project personnel not directly involved in Core project
R (Research Formulators)	3	4	7	24
S (Supporters)	8	4	12	44
<b>Total</b>	<b>11</b>	<b>8</b>	<b>19</b>	<b>68</b>

In any developmental encouragement of metascience, it will likely remain for sometime numerically quite a minority to normal science. Although allied projects might become core projects themselves during the evolution of metascience, the likelihood is that it will be some years before every allied project overlaps with a core project. Even at that time the ratio of metascience to normal science personnel will be 11:68, with 8 others shared. At maturity the number of personnel in metascience and in normal science should be about the same. This is because metascience will continue to depend upon normal science's reductionistic

insights for some of its insights in constructing an integrative, synergistic metascience.

4. Core project extension domain, D, (fig. 4)

The activities of a core project, and the results of their research have possible interests to several categories of individuals such as: other scientist, educators, the public who may be affected by application of developed insights, technologists and other change agents who may utilize the insights to implement change, and news media. From the time of establishment of a core project considerable attention should be given to promoting information flow both within the core project and between it and its extended audience. Metascience assumes a relatively diverse and sophisticated audience concerned with each core project's objectives. Maintaining relatively open exchange with such audiences will help avoid parochialism, and the ivory tower stance.

5. The extended core project, E, (Fig. 4)

In terms of the prior formulations  $C + D = E$ .

6. Research visible college,  $(E_1 \text{ to } E_7) = V$  (Fig. 5)

By design, several extended core projects ( $E_1$  to  $E_7$ ) are brought into an integrated whole through a process of self-organization and accretion into a visible college. The term "visible college" is here used to convey the sense with which more loosely organized normal science networks have been designated as "invisible colleges." From a metascience perspective invisible colleges will become much more visible. At the outset there must exist, or be brought into being, two core projects,  $E_1$  and  $E_2$ . Core project  $E_1$  represents the coordinative member of the visible college. Its functions are dual. First, it assumes responsibility for coordinating the organization of the visible college, facilitating information flow among the

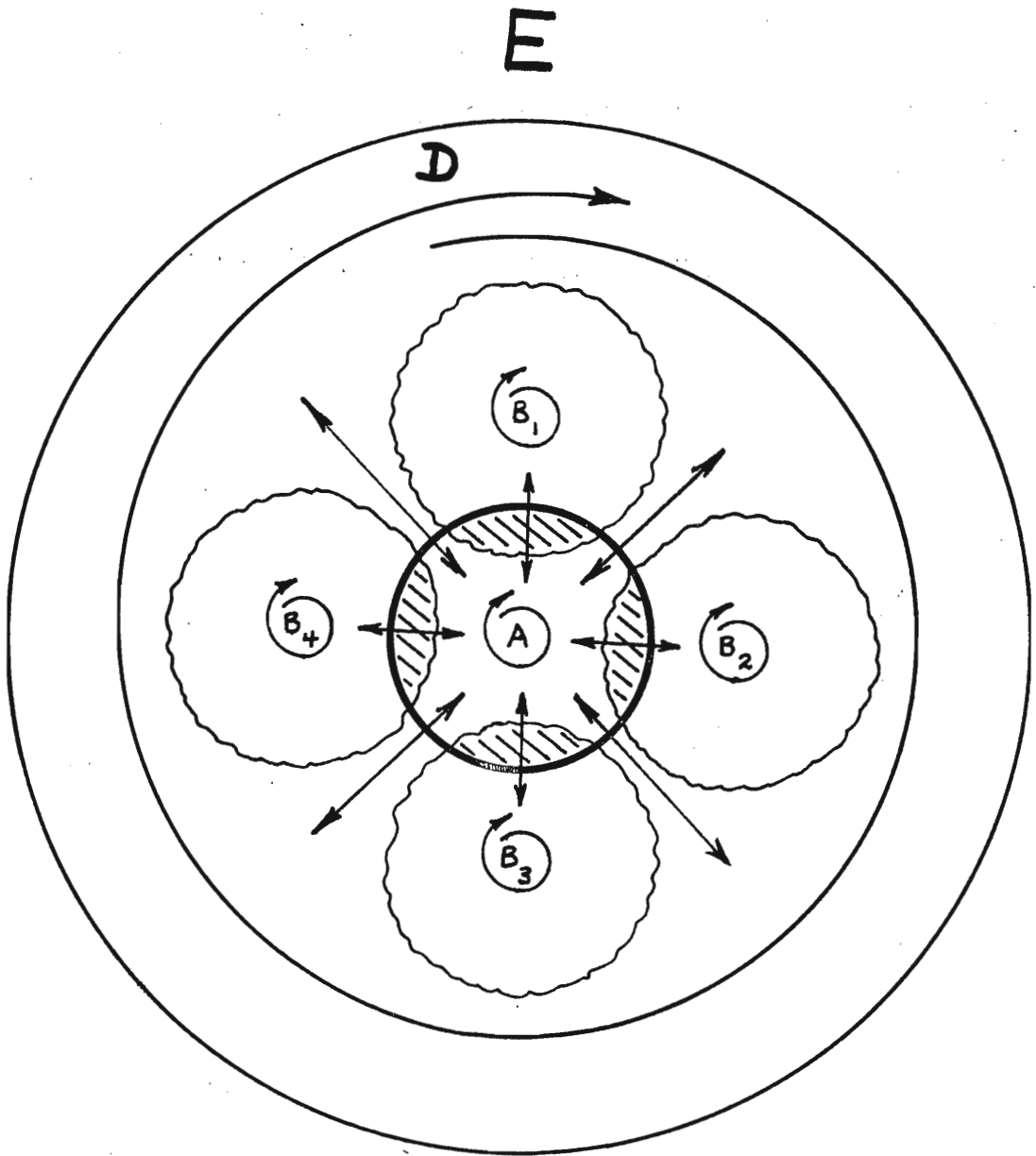


Fig. 4 Clientele domain, D, of Project Constellation, C

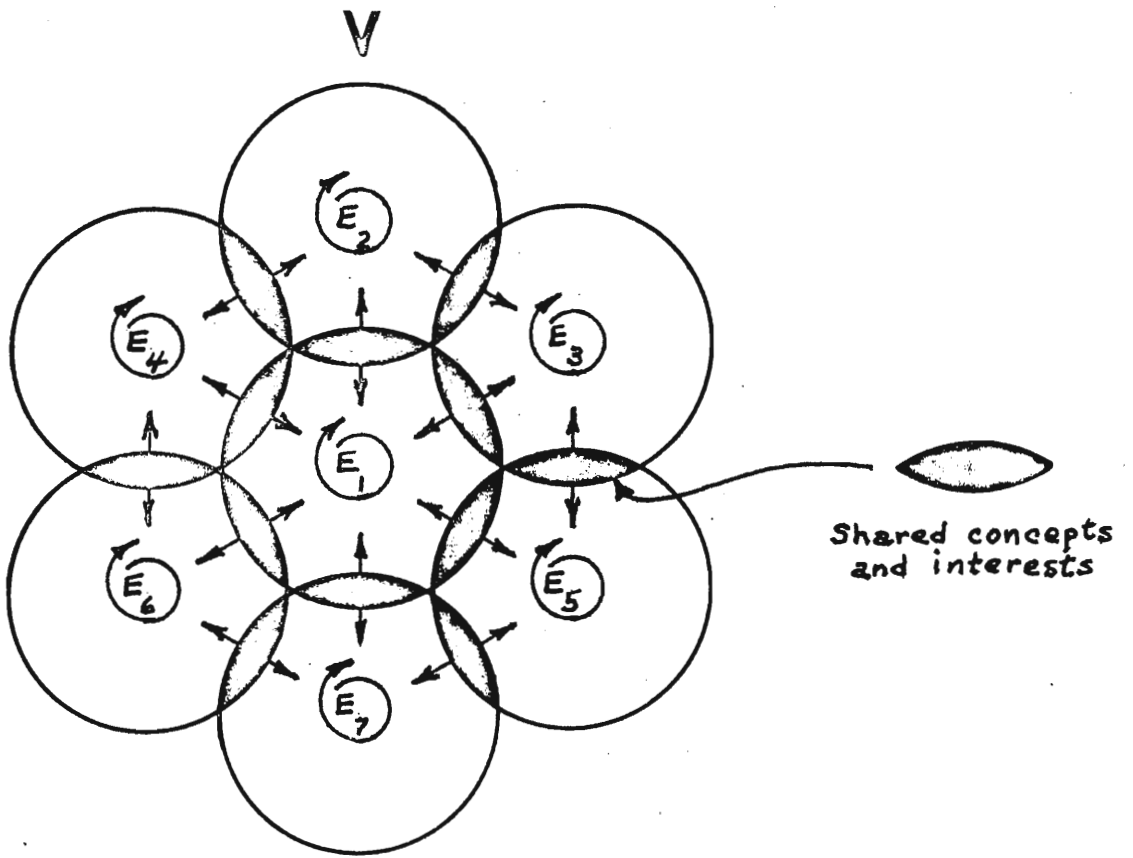


Fig. 5 Research Visible college, V, composed of 7 project constellations (+ their associated clientele domains)

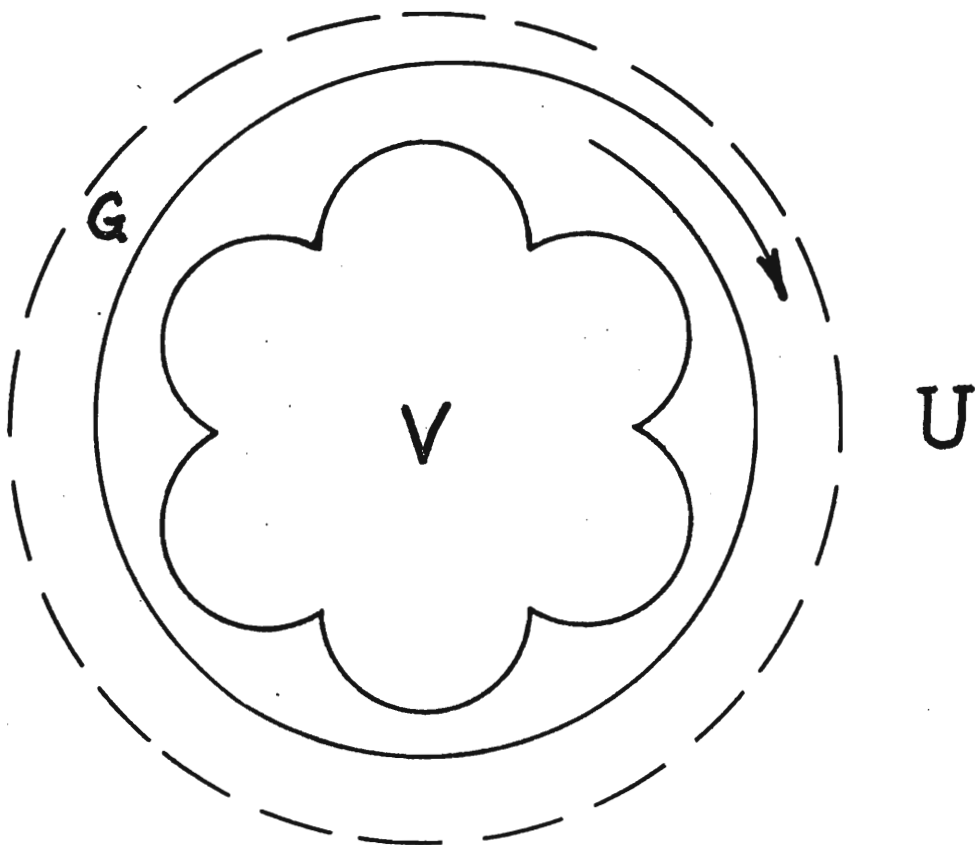


Fig. 6 Extended clientele domain, G, to Visible college, V (V + G = Research and Impact domain, U, "Urgaster")

contained core projects, and promoting budgetary support for their activities. Second, it conducts research on the process of metascience research with particular reference to its conduct within the visible college of which it is a component part. In this latter connection it will serve as the interface with the "monitoring college", M (See section 9).

Core project  $E_2$  is the component about whose interests the objectives of a whole metascience effort begins to take form. Its interests must be capable of outward extension to encompass a fairly broad range of scientific problems whose clarification promises to reveal now unrecognized scientific problems while its ongoing research provides insights of potential utility for application in the public domain. As an example, I will take certain developments within the Section on Behavioral Systems to illustrate how an  $E_2$  core project could serve to initiate a metascience effort:

The culmination of 25 years of research on social behavior and population dynamics with rodents has led the Section on Behavioral Systems to recognize a set of processes which produce individuals that are incapable of complex behaviors such as are involved in the social interactions between two individuals. Processes which contribute to this prevention of origin of complex behavior include: (1) Altering the social structure such that individuals prepared to fulfill social roles are rejected. The process of social rejection of one young adult cohort leads to maternal rejection in the next younger cohort. (2) Increasing the contact rate among individuals by crowding or by altering the physical structure of the environment to restrict the avenues of locomotion between places. (3) Increasing vitamin A in the diet. Regardless of level of vitamin A intake, when processes (1) and (2) above begin to interfere with development and expression of complex behaviors, animals so affected begin to store much larger than normal amounts of vitamin A in the liver, with accompanying elevations of

circulating levels of vitamin A in the serum. Increase in dietary vitamin A leads to a much sooner inhibiting of development of complex behavior due to processes (1) and (2).

Although the research program of the Section on Behavioral Systems can continue to elucidate the above processes, its program will continue with relatively less effectiveness than under conditions where it (as a  $C_2$  core project of an  $E_2$ ) was formally interfaced with "allied projects" where capabilities exist for exploring important aspects of the overall problem: Let  $B_1$  to  $B_4$  (see Fig. 3) represent such allied projects:

$B_1$  = a program with the capabilities of providing insights into the alterations in CNS anatomy and function characterizing animals which have failed to develop complex behaviors.

$B_2$  = a program with capabilities of providing insight into the biochemistry of neurophysiological changes characterizing breakdown in capacity for complex behavior.

$B_3$  = a program with capabilities of exploring those aspects of vitamin A and tryptophan metabolism which become impaired as complex behaviors fail to unfold.

$B_4$  = a program concerned with the details of individual behavioral development.

The  $E_3$  core project: In any instance of metascience development, the  $E_3$  core project should be quite closely related in its objectives to  $E_2$ , but at some higher level of organization of the elements involved. Both  $E_2$  and  $E_3$  should enjoy sufficient geographical proximity as to permit frequent interaction. In the present example, when  $E_2$  is concerned with experimental animals,  $E_3$  should deal with psychological, psychiatric and social aspects of comparable problems on the human level. Judging by the characteristics of rodents produced in the studies of the Section on Behavioral Systems it might be suspected that  $E_3$  would focus on infantile autism, childhood schizophrenia,

parental rejection and adolescent withdrawal as anogen to inadequacies of development of complex behaviors and social participation as adults.

Core projects E<sub>4</sub> and E<sub>5</sub>: For them a change in institutional setting would likely prove beneficial, for example in universities. E<sub>4</sub> would be expected to have closest affinities to E<sub>2</sub>, and likewise E<sub>5</sub> and E<sub>3</sub>. However, E<sub>3</sub> would serve as advisor to E<sub>2</sub> in selecting E<sub>4</sub>; and likewise E<sub>2</sub> would serve as consultant to E<sub>3</sub> in selecting E<sub>5</sub>. And as mentioned above the coordinating core project, E<sub>1</sub>, would facilitate the formation and function of the research network.

Core projects E<sub>6</sub> and E<sub>7</sub>: At this level of organization of the metascience visible college, the core projects should involve natural experiment in larger more complex sociocultural-environmental contexts where two or more communities or populations for either E<sub>6</sub> or E<sub>7</sub> can serve as contrasts due to differential history. Although both E<sub>6</sub> and E<sub>7</sub> might be concerned only with human subjects, E<sub>6</sub> would best relate more closely to concerns of E<sub>2</sub> and E<sub>4</sub>, for example be concerned with the implications of difference in the structure of the physical environment. Likewise E<sub>7</sub> objectives might be expected to relate more closely to those of E<sub>3</sub> and E<sub>5</sub> and be more concerned with the consequences of differences in structure of the social environment.

#### 7. Visible college extension domain, G

Developments resulting from core projects E<sub>2</sub> and E<sub>7</sub> will converge through and be integrated by E<sub>1</sub>. As a result of this synergism the product of the visible college will have implication to and interest for a wider audience than that comprising the collected extension domains D<sub>1</sub> to D<sub>7</sub> of core projects E<sub>1</sub> to E<sub>7</sub>. Relating to G will primarily be a responsibility of E<sub>1</sub>.

### 8. The "urgaster", $U = V(E_1 \text{ to } E_7) + G$ (Fig. 6)

Urgaster is a term here coined to mean "the original digesters of ideas", from ur, original; gast = ghost = apparition = image = idea; and gastero-, Greek, belly, as implying digestion. Thus a metascience visible college,  $V$ , with its extension domain,  $G$ , represents a new pattern of organization of research effort justifying being explicitly designated, as here done by the term "urgaster." On the average about 133 (i.e.  $7 \times 19$ ) persons would be direct participants in an urgaster with regard to its insight generation and coordination functions. Such functioning warrants their designation as Homo sapiens in other than a taxonomic sense. However, as a cultural species, more individuals warrant the designation, Homo faber, the builder or fabricator, the utilizer of ideas generated by others. Digestion implies making energy (information) available for some utilitarian function. The extension domain,  $G$ , encompasses an audience with capability for applying insights generated within the visible college,  $V$ . One of the functions of  $E_1$  is to assure that there is a  $G$  which can utilize  $V$ 's insights.

### 9. The monitoring college, $M$ , (Fig. 7)

According to Ashby's law of essential control, any set of actors must be monitored by an equal number of elements whose function is to ascertain how effectively the actors meet their intended objectives. Actors here are the members of the visible college,  $V$ . This degree of monitoring can be achieved in the following way: Let  $m_1$  to  $m_7$  be sets of individuals respectively sharing the interests of  $E_1$  to  $E_7$ .  $m_1$  includes three senior and four supportive staff.  $m_1$  communicates directly with  $E_1$  and also with  $m_2$  to  $m_7$ . Members of  $m_1$  devote approximately 50% of their time to monitoring functions relating to  $U$ .  $m_2$  to  $m_7$  each includes two senior and one supportive staff, each of which



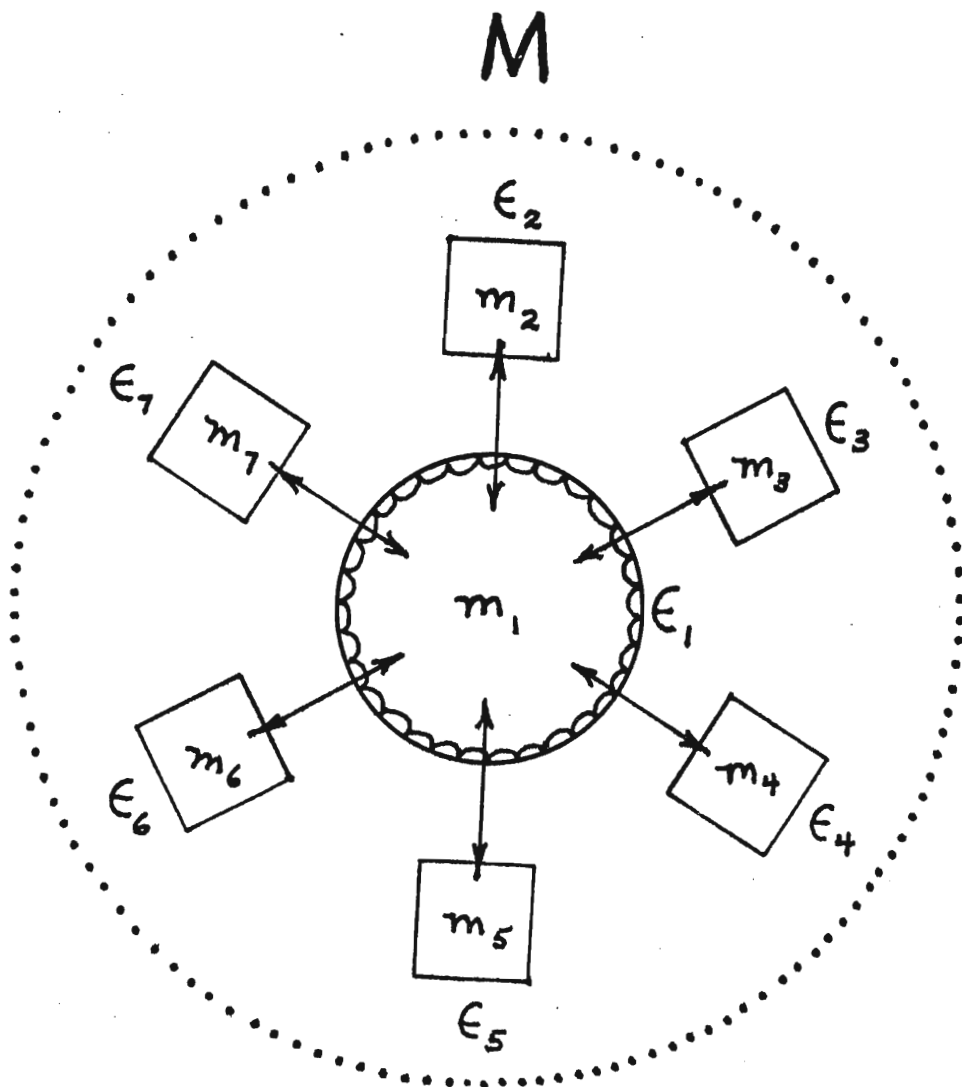


Fig. 7 Monitoring College,  $M$ , of effectiveness of Research Visible College,  $V$

devotes 25% of its efforts to monitoring functions.

According to this formulation there are only 25 part-time monitors for the more full-time 133 members of V. This does not meet the requirements of equivalence between the monitoring function of M and the insight generation function of V.

However, it is to be noted that much of the activities of members of V are devoted to research "doing", data acquisition, rather than analytical, integrative thinking. Furthermore it is intended that  $m_1$  to  $m_7$  each identify extension groups  $\epsilon_1$  to  $\epsilon_7$  who can participate in their monitoring functions.

$m_1$  to  $m_7$  are expected to maintain in depth familiarity with the programs of  $E_1$  to  $E_7$  respectively. In addition they are expected to provide input with regard to broader realms of current knowledge bearing on the research efforts of  $E_1$  to  $E_7$ . Much of this input will be via the Alerting Unit,  $\alpha$ , (see section 10, Fig. 9).

The interaction between M and U is designated as  $\mu$  (Fig. 8).

#### 10. The alerting unit, $\alpha$ (Fig. 9)

Operationally the alerting unit coordinates activities and produces outputs which amount to a prosthesis to brain function. The extended domain of concern and impact of the visible college can be expressed by a relatively small number of major concept relationships and of subtopics under each. The first objective of the alerting unit is to select and condense relevant information with accompanying in-depth indexing, and designation of approximate equivalence among concepts. When this is done, software programs can simulate both the creative and consensual functions of central nervous system activity to increase the scope and effectiveness with which information may be integrated to subserve the objectives and needs of the visible college and its extension domain.

Approximately 80 persons in the M:U network could be

expected to provide input for such a brain prosthesis. Each of these 80, each year, would be expected to select 2 books and 15 articles deemed most relevant to the broader objective. These would be selected with sufficient screening to represent only 5% of publications examined. Each such source would then be condensed to 5 to 10% for books or 10 to 25% for the shorter articles. This selection and condensation would provide about 25,000 excerpts (paragraphs) of information per year.

The following quotations (Calhoun, J. B. The Promotion of Man. In Attinger, E. O., Ed., Global Systems Dynamics, S. Kanger, Basil, New York, 1970) provide elaboration of the alerting function.

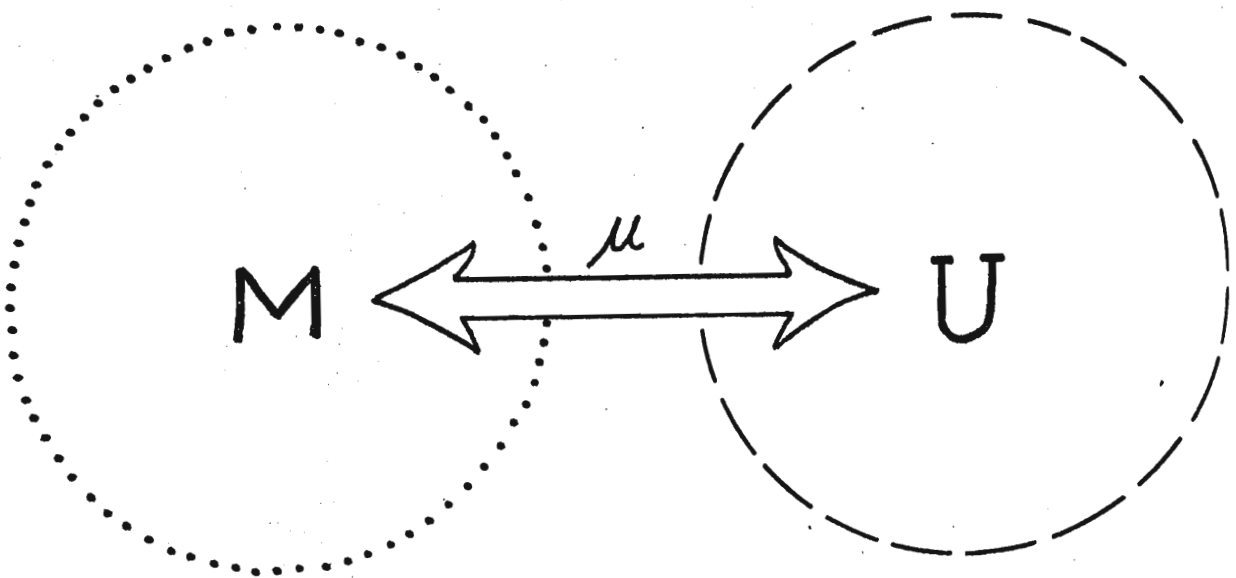


Fig. 8 Mutual information flow between Monitoring College, M and "Urgaster", U

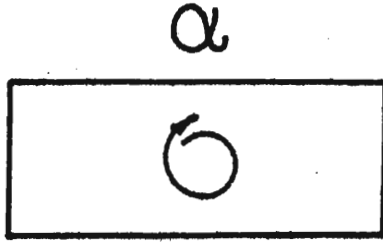


Fig. 9 Alerting - Prosthetic Brain,  $\alpha$

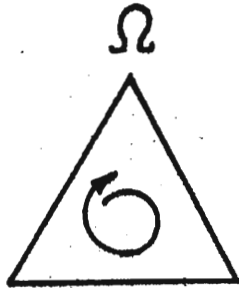


Fig. 10 Appreciative System,  $\Omega$



Fig. 11 Patron(s) (age)

### Alerting

Any institution of the size, complexity, and impact of a government agency, a corporation, university, or church is a 'big system'. Each of these does continue to function and to make an impact upon society. However, for all practical purposes each lacks an essential component, which I am here calling an 'Alerting Unit', without which it can only ineffectively be aware of its mission, much less pursue this mission with any degree of effectiveness. Such an Alerting Unit represents a subsystem of the larger system and so may be designated an Alerting Sub System. The obvious acronym has significant symbolic overtones lacking any facetious quality.

It is certainly no happenstance in Judaic-Christian mythology, during the historical development of Isaiah's concept of the role of the suffering servant, that an ass, a creature epitomizing the notion of passive suffering, became a vehicle of hope and awareness. Though I do not wish to push this analogy too far, it is rather patent that all large institutions, all really big systems, lack an effective sensory system – a means for alerting the system to opportunities of purpose and function, to the complexities of its own internal variety, and to the linkages it has with other institutions. All such alerting, all such increase of self-awareness by the system, introduces threats. It is a major function of sensory systems to facilitate awareness of threats; and the immediate initial reaction is to reject the awareness of the threat – to block off perception. So any organizational structure such as an Alerting Unit, an Alerting Sub System, must be willing to suffer continually at the hands of its master, the system itself, to which it must continually provide more condensed 'food' for thought; food which is often unpalatable because it is strange and if eaten will instigate novel responses.

What I have in mind as the role for an Alerting Unit, Sir STAFFORD BEER [2] implied rather directly when he said: 'We should be thinking in terms of a new kind of engineering system in the world. It would be an engineering appropriate to big systems, aimed at providing requisite variety for control, equipped with variety generators, redundant circuitry, and an interpenetrative connectivity.' The Alerting Unit represents none of these directly but all indirectly, and the variety generator function most directly of all. It becomes a means by which the institution or system more effectively develops awareness, selects goals, conducts the functions of its contained subsystems, and develops connectedness with other institutions.

Central to the function of an Alerting Sub System is *scanning*. This involves searching the existing universe of concepts, ideas, philosophies, purposes and functions, and then *condensing* and *relating* them for possible relevance as input into a system or for placing its output into a perspective of relatedness to other institutions. One type of input might be a continuing anthology as I have developed regarding population and mental health, made more effective by further exploitation of the techniques of forming 'natural nets of generic ideas' and of utilizing the 'creative search program' as tools for developing insight into relatedness and relevance. However such techniques may evolve, they will introduce a range of new types of inputs into the system from which policy, managerial, or operational aspects of functioning can reject *in toto* or make choice. Any choice among new information implies new categories of responses. This new type of information can assist in the

control of the system by assisting in reducing uncertainty. Even though arising from outside the system, such information amounts to negative feedback.

However, in many instances the responses elicited by new information will engender deviation from prior norms of function. A prior function will be replaced by an altered one in essentially a 1:1 ratio, or the new input may introduce new variety, new complexity to the system. In either case such new information will have the effect of positive feedback, of introducing oscillation into the system. This variety generating capacity of the Alerting Sub System has two opposing functions. By adding information which increases complexity, new goals, or altered goal orientation, it makes the system less stable at the same time that it thus increases its scope and potentialities; in essence, it *creates crises*. On the other hand, the Alerting Sub System provides information which can *enhance control*, will make the system more rapidly achieve stability. According to ASHBY's law of requisite variety, 'Control can be exercised only by a controller having at least as much variety as the system being controlled'. What this says is that the Alerting Sub System must also engage in a proprioceptive internal scanning to ascertain the extent to which each unit of internal variety is paired with input affecting the control of that subsystem, which in turn often means that new information must be brought to bear upon the subsystem from sources outside the system or, if within the system, it consists of information whose relevance or availability to the subsystem has previously not been perceived or is actually deficient.

The final aspect of the Alerting Sub System has to do with the *timing function*. Outputs from one subsystem become a function of inputs from others. Every change in magnitude or quality of output of one subsystem, which to another subsystem is experienced as input, introduces perturbations of adjustment into these other subsystems. Each such adjustment requires some period of time for completion, for relaxation of the induced perturbation. A critical issue of the approaching future lies in the fact that the interval between changes (inputs) requiring adjustment is beginning to approximate the interval of time required for an adjustment. So beyond the problem of excessive oscillations introduced by altered inputs, there is the problem of 'system neurosis' or 'system breakdown' arising from a magnitude and frequency of change in input which the system cannot handle. It therefore becomes important to monitor the system, and perhaps filter or schedule input so as to allow not only for adjustment but for assessment of how well the achieved steady state after adjustment functions to accomplish the altered interpretation of mission.

### 11. The omega appreciative system (Fig. 10)

Metascientific efforts, such as herein described, must take place within a larger institutional framework, subject to its financial support and approval to assure that the objectives of the metascience effort harmonize with the broader mission of the parent agency. It must also be kept in mind that the consequences of metascience's functioning may introduce insights having policy implications for the institution and value changes for society. Translating metascience insights into suggested policy and values requires the intermediary attention of a small group of philosophers and policy scientists who form the appreciative system. Their deliberations, evaluations and recommendations result from input from the monitoring college: visible college interchange,  $\mu$ , as well from the conceptual information data base of the  $\alpha$  alerting system. However, the output of the appreciative system is intended primarily for the institutional patrons (see Section 12, Fig. 11), although there is no inherent reason why much of its output cannot enjoy wider visibility. That is to say, the appreciative system should have some responsibility for disseminating its condensed insights to a general public ( $\pi_2$  in Fig. 12).

The following excerpts from Calhoun, 1970, ibid, provide further elaboration of the implication of the appreciative system.



## Appreciation

Even were the alerting function developed in sufficient scope to remove the blindness and myopia to the implication of existing and needed change, there would still remain a void, the absence of an effective means for evolving those images, those values, which represent the goals toward whose fulfillment our action is directed. Sir GEOFFREY VICKERS [35] defines the issue. He says: 'Men, institutions, and societies learn what to want as well as how to get, what to be as well as what to do; and the two forms of adaptations are closely connected. Since our ideas of regulation were formed in relation to norms which are deemed to be given, they need to be reconsidered in relation to norms which change with the effort made to pursue them.'

'So I shall concentrate on the processes involved in the first segment and I need a word to describe them. Since I cannot find one in the literature, I will call them collectively "appreciation", and I will keep the word "regulation" for the second segment. I will credit the appreciating agent with a set of readiness to distinguish some aspects of its situation rather than that, and constantly to revise these readiesses; and I will describe these readiesses as an appreciative system.'

Professor F. S. C. NORTHRUP [32] defines the value of such appreciative systems for society: 'Human societies ... (can) radically reconstruct their social organization with the rejection of an old normative social theory and the acceptance of a new one. This is possible quickly only when a society or its leaders have reached a majority agreement upon a systematic normative social theory and possess an excellent system of communications to acquaint and habituate the leaders of that society and, if possible, a majority of the people with that normative social theory ... In short, in any culture embodied ideas defining purposes or ideas really matter.' The task I now address myself to is: 'Can insight derived from animal behavior and social organization provide a basis for

developing appreciative systems?' Before seeking a partial answer, it will be helpful to make another analogy. Along the evolutionary lineage leading to man, as judged by types of presently living animals which represent these stages, we note a gradual transition. The more primitive forms are characterized by a predominance of pre-programming of the sensory-motor system, as mediated through the nervous system, such that each individual animal tends to respond in a highly predictable fashion in any given environmental situation, even when exposed to it for the first time. In VICKERS's terms, regulatory systems are highly elaborated and deterministic. As we ascend the evolutionary ladder toward man this rigidity becomes altered by an enhanced capacity to profit from experience, to alter ways of responding, to incorporate new behavioral states, as conditions in the environment change during any individual's life-span. From such changing and enlargement of the behavioral repertoire, we can infer comparable alterations and additions to developed images. Again, in VICKERS's terms this evolutionary trend may be phrased in terms of an accumulation of the role of appreciative systems in any individual's life. Turning to the human situation we may note that institutional organizations have tended to produce efficient mechanisms for responding to static conditions. They have become culturally innate regulatory systems. What VICKERS is saying is that in this era of ever-increasing rate of social change, cultural evolution has for some reason not yet been able to provide for effective appreciative systems, much less their gaining ascendancy to regulatory systems. That such ascendancy is fundamental for the survival of the human species may well account for the broad appeal of TEILHARD DE CHARDIN's concept of the *noosphere* to many contemporary thinkers as they view the developing course of human destiny.

Any subassembly of the appreciative system provides an arena for subdued confrontation where divergent values, tempered and enlightened by input from the alerting system, can reach accommodation and modification through a process of expressing and then alleviating the emotions such confrontation inevitably generates. No matter how much rationality individual participants think they bring to the situation, it takes repetition of involvement in an atmosphere of readiness to expose one's images to divergent interpretation before attendant anxiety dissolves as new images gradually emerge and are accepted. Emotion, intellect, and creativity have their respective roles to play in this slow process which designed confrontation can assist in accelerating.

12. The patronage component, P, (Fig. 11)

Metascience, even more so than normal science, requires patronage, whether arising from public or private sectors. For simplicity, only two levels of administrative patronage support,  $P_1$  and  $P_2$ , are shown in Fig. 11. With reference to the example given in Section 6,  $P_1$  = National Institute of Mental Health,  $P_2$  = Department of Health, Education and Welfare.  $P_1 + P_2 = P$ . Information and evaluations passed from  $\Omega$  to P provide the basis for reassessment by P of the degree of further support of the particular metascience effort.

13. A metascience system (Fig. 12)

Relationships of all major elements discussed in Sections 1 to 12 are depicted in Fig. 12.

14. Suggestions for implementation

Current reevaluation by the National Institute of Mental Health of its role in supporting and promoting biomedical research indicates that the time is now propitious to consider new organizational modalities such as here proposed. The present proposal has the advantage that it can be superimposed upon existing organizational structures, supplementing their present strengths, while avoiding the disruptive consequences that would accompany total reorganization of research.

Metascience presupposes a continuing interfacing among types of efforts that usually interrelate tenuously and ineffectively. Once such interfacing within one particular metascience effort had become established, its effectiveness could only become optimal were there opportunity for it to join in a network of similarly organized metascience efforts. For example the focus suggested for the promotion of a pilot metascience effort, could be linked with comparable ones in HUD, EPA and the Smithsonian Institution which share concerns with

the environment and its utilization to enhance human well-being. The trial linkage of four such metascience efforts would provide the opportunity to resolve the interfacing across agency boundaries that must be accomplished to explore fully those complex problems which presently have greater scope than that covered by the mission of any single agency.

Many variants of the proposed organization could facilitate metascience development. The growth of metascience could be encouraged through the budgetary process. Every research unit within government, and every outside applicant for funds, could be required to justify the proportion of its effort that could best be pursued by more intense, reductionistic, and isolated normal science organization, and the proportion best pursued through the more diffuse, holistic, and interfaced metascience organization. Where some or all of the effort would be metascience the research organization or applicant would have to describe the proposed organization of the metascience effort. Any such organization requires establishing a consortium of interests and capabilities that cut across established administrative boundaries. Metascience demands institutional innovation.

Much of what has been said in this formulation focuses on an extension of science. However, the greater bulk of policy and action in the public and private spheres entails consideration of the many complex issues requiring detailed intellectual, analytical and synthetic investigation. One may or may not choose to characterize such investigation as science. Nevertheless, a parallel organization of metainvestigation could enhance the effectiveness with which we cope with the complex issues affecting society today.

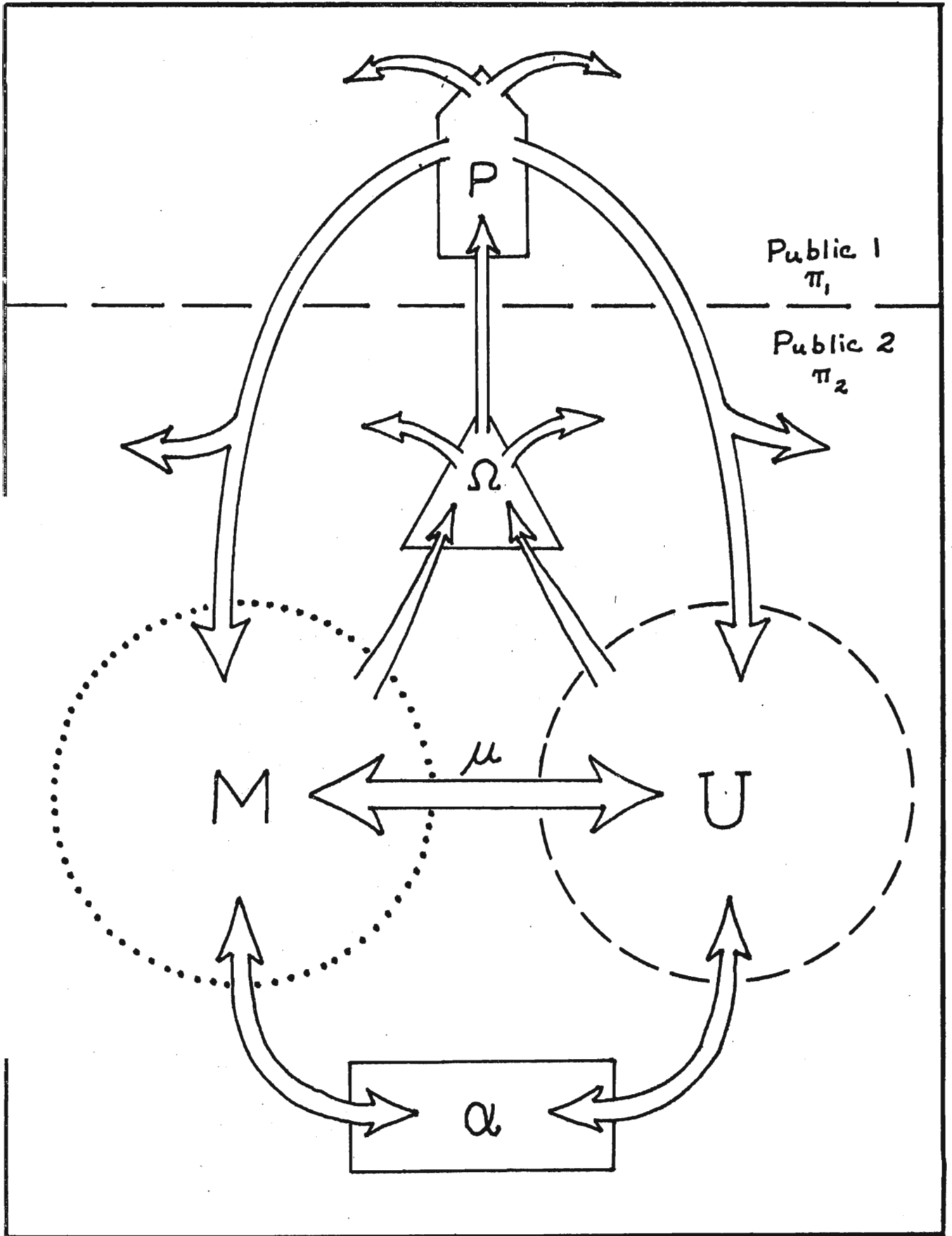


Fig. 12 Synergistic Research on Research System

A FUTURE-CREATIVE AND VALUES-SENSITIVE POLICY SCIENCE PARADIGM<sup>+</sup>

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During the 1950's and the 1960's, most governments became extremely preoccupied with quantitative measurements of growth as measured in such terms as rates of growth in Gross National Product. In the late 1950's the U.S. witnessed, as a result of the Russian Sputnik, a temporary weakening of her technological world image, which was immediately followed by an enormous increase in the prestige and role of science and technology in the achievement of national goals, such as landing a man on the moon. By the late 1960's much of the post-World War II generation, which was in the main raised in affluent, permissive, and safe suburbia, began questioning the validity and meaning of the traditional economic and military imperatives which were until then taken for granted by the previous generations. The threat of a world catastrophe through nuclear weapons, coupled to the prolonged Vietnam conflict, led to the revitalization of pacifism, antimilitarism, and cosmopolitanism.

In the early 1970's ecology and neo-malthusianism emerged and became extremely fashionable in the U.S. The passage of the "National Environmental Policy Act of 1969" represents a milestone in terms of National policy, since it recognizes "the profound impact of man's activity on the interrelations of all components of the national environment, particularly the profound influences of population growth, high-density urbanization, industrial

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<sup>+</sup>All views expressed in this paper are those of the authors and not of their organizations

expansion, resource exploitation," and other relevant factors. When seen in an evolutionary context, this Act provides a fundamental change in Man's perception of his role and interdependency with the natural environment. This perception furnishes some of the basic assumptions for the anti-industrialist anti-technology, and anti-rational ideologies that have emerged and become fashionable among primarily the younger people.

Since the publication last spring of the Limits of Growth study sponsored by the Club of Rome, the debate among scientists and the general public over issues related to the impacts on the environment of population and economic growth has been greatly accelerated. This debate is however, still carried out predominantly within the context of an industrial macro-economic perception of the meaning of "growth." It appears to be insensitive to cultural and demographic changes occurring in post-industrial societies, and in general to the heterogeneous philosophical, religious, and cultural values, and their dynamics, observed in different parts of the world. It assumes the universal validity of goals derived from the already industrialized nations. It implies that "quality life" begins at \$1000 percapita income, and that such a national average can be achieved through a strategy of high annual increases in the GNP.

Recently one of us had the opportunity to review some of the research reports that were prepared for the Commission on Population Growth and the American Future, the final report of which

was presented to the President of the United States approximately one year ago. In reading this research material, one gets the impression that most of the modeling and the policy research substantiating that report were based on a predominant mechanistic and deterministic perception of reality. In light of some of the emerging demographic, cultural, and ideological trends, one becomes skeptical of the relevancy of this material for making policy that purports to be responsive to our contemporary situation. Furthermore, one fears that some of the findings and recommendations, if adopted by policy makers, will lead to decisions and actions that downgrade the potentialities of the world when viewed in a "whole system" context.

The purpose of this paper is to elaborate on some of the points mentioned above by looking at them from a "policy science paradigm" perspective. The term "paradigm" is employed here to refer to the basic way of perceiving, thinking, and doing that is associated with a particular image of reality, communicated primarily through conceptual models, and empirical examples.

Scientific paradigms emerge and gain their status among the scientific community because they provide a capability to comprehend certain phenomena and to solve some acute problems. The success of a paradigm -- whether Ptolemy's computations of planetary motion, or Einstein's discovery of the theory of relativity -- depends largely on its ability to extend the boundaries of understanding, i.e., to interpret a new set of phenomena.



Historically, there have been instances where scientists exhibited a bias to suppress some novel or strange phenomena which could not be explained by the dominant paradigm. Because scientific education is both rigorous and rigid, scientists have a tendency to defend the validity and objectivity of their theories. Many times they fail to recognize that objectivity is paradigm-dependent, and it cannot be attained, even in sciences like physics, in a detached, deliberately impersonal, and completely value-free mode. When these "anomalous" phenomena pervade and cannot be explained by the dominant paradigm, then gradually the scientific community shifts to a new perception of reality. Such a "paradigm shift" can be thought of as a scientific revolution.

In our opinion exactly such a "paradigm shift" in policy science is desirable in order to better comprehend and to model our contemporary world situation. In particular, on account of the heterogeneous nature of the world it is essential to adopt a paradigm that, on the one hand assumes a global perspective, and on the other hand is culturally sensitive. One should not forget that even though almost all the countries of the world are presently undergoing rapid changes, and hence are experiencing problems related to the changes, these problems are by no means identical for all countries. In fact, what is a problem for some countries may be perceived as a desirable goal for some other countries. For example, there are countries suffering from the success of their industrialization and resource depletion, while others are striving for industrialization. The material growth of the European and

North American countries has, by and large, been accepted among policy scientists as the universal definition of progress and modernization. In fact, modernization has been directly linked to the "rationality" of the Greek-European paradigm, which is characterized by such properties as causality, hierarchy, quantification, competitiveness, and homogeneity.

To summarize, the two major propositions advanced in this paper

- are:
- (1) The dominant policy science paradigm, because of its extreme emphasis on empirical evidence and "rationality," is marginally relevant to the contemporary situation of mankind; and
  - (2) A "new" futures-creative and values sensitive paradigm is required to support policy decisions and actions; on account of its value-sensitivity such a paradigm need not be applied indiscriminately to all the diverse cultures of a heterogeneous world.

In the next two sections we will attempt to elaborate on the international policy implications of these two fundamental propositions.

IIA View of the Contemporary Situation.

The world's population is increasing at about two percent annually, doubling every 35 years. It took two million years for the earth's population to become one billion by the year 1830. It took 100 years for the world population to become two billion in 1930, and if the current annual rate of growth continues it will reach 12 billion by the year 2030, and approximately 50 billion by the year 2100.

If one superimposes on the population growth dimension, the increase in travel and communication speeds around the globe, one can easily arrive at a hundred-fold shrinking of the geographic scale of our planet within the span of approximately 100 years, i.e., between 1850 and 1950. That is to say, the time required to travel around the globe, in 1850 was a few months, this same trip was reduced to a few days by 1950, and is now reduced to a few hours.

The Gross World Product was equal to  $\$3.5 \times 10^{12}$  in 1970 (i.e., 3.5 trillion in 1972 dollars). If current five percent annual growth continues, the GWP will be equal to 60 trillion in the year 2030, and become 2,000 trillion by the year 2100.

The production of world energy has increased at the average rate of three and one-fourth percent annually from 1860 to 1950 with various growth periods during that period when levels rose above

five to six percent. During the 1960's, the world's consumption of industrial energy from all sources increased by approximately 19 percent. Much of this unprecedented rise is due to increased consumption in the high energy economies, such as the U. S., which consumed about 33 percent of the world's total industrial energy for less than seven percent of the world's population. The supply of energy is a key factor not only for the industrialized nations but even more for the highly populated, less developed regions (LDR's). The LDR's need energy for transportation, communication, for local fertilizer production, for industrialization and education. Though the rate of industrialization is slow in the LDR's, in some cases the growth rate of electricity consumption is as high as 15 to 20 percent. It is estimated, therefore, that just to maintain double the earth's present population in the next 30 years (i.e., a population of 6 billion by the year 2,000), with no attempt to raise standards of living, not double, but over five times our current rate of energy production will be required.<sup>1</sup>

The rapid growth of world population is due to the unprecedented success in recent years to control disease and to provide food. Ironically, the success in providing medical services to the majority of the people is giving rise to many of mankind's most pressing problems, such as widespread illiteracy, rising levels of unemployment in the poor countries, and the deteriorating physical environment. Unemployment is rising in every region of the world. In Latin America unemployment jumped from 2.9 million in 1950 to 8.8 million in 1965, and is still climbing. In countries like Pakistan, Ceylon, Malaysia, and the Philippines, the

unemployment rate is 15 percent or more. Current policies among the rich countries tend to discriminate against products of poor countries in order to protect their own industries: (examples: textile and shoe industries in the U. S., beet sugar industry in U. S. and Europe, wheat in Common Market countries, rice in Japan).<sup>2</sup> Poor countries thus cannot sell products to rich, and therefore, lack jobs.

Continuation of such shortsighted policies will most likely lead to a worsening of the present situation and will bring about such consequences as an accelerated widening of the gap between rich nations and the poor ones; a widening of the gap between the rich and the poor in poor nations; declining living standards, starvation, and misery for the majority of mankind. In the 1950's and 1960's, that is before the arrival of the ecological consciousness, it was "reasonable" for rich countries to assume that such gaps can be narrowed by raising the GNP and the per capita income of the poor countries. The environmental crisis, however, suggests that it may be possible to narrow the gap only by slowing the rise in living standards among the rich countries.

There is another dominant world trend that needs to be seriously acknowledged. This is the dynamic evolution of human settlements into continuous urban systems, which will gradually, by the year 2100, merge into a continuous universal city or the Ecumenopolis of C. A. Doxiadis:

"(Ecumenopolis) is the inevitable future of Human Settlements in the next few generations, and we can foresee that assuming we avoid any major catastrophe, we will have to deal with a universal city whose population will tend to be stable in numbers but increasingly more developed intellectually and socially, which will dispose of much greater quantities of energy and achieve greater social interaction."<sup>3</sup>

The trend towards the Ecumenopolis is particularly dominant in emerging post-industrial societies such as the U. S. The metropolitan area growth of the United States has been consistently more rapid than the increase of national population during the 20th century. Measured as a percentage of national population, metropolitan areas in 1960 contained 66 percent of the nation's population. By 1970 this percentage had increased to 71 percent of the national total. These trends have transformed the United States from a country that was 60 percent rural in 1900 to one that was more than 70 percent urban in 1970. By the year 2000, based on trends of 1940-1970, 85 percent of the Nation's population is projected to reside in major metropolitan areas.<sup>4</sup>

A shift of such dimensions in where people live and work has caused major economic, social, and environmental changes for both the receiving metropolitan areas and the people left behind. As recently as the turn of the century, some 35 percent of America's workers were involved in agriculture. Today only 4.4 percent of the labor force is employed in agriculture and that figure is projected to decline to two percent by the year 2000. Employment in goods-producing industries such as manufacturing, construction,

and mining has also been continuously declining relative to the total employment since the 1950's when the post-industrial or service economy emerged. Around 1956, the service-producing industries took the lead over jobs in the goods-producing industries. When this happened, the United States became the first nation in the history of the world where the number of manual or blue-collar workers was exceeded by the so-called white-collar occupations.

The continuous eclipse of traditional industrial pursuits, i.e., agriculture and manufacturing, and the rise of the service-producing industries within a continuously growing metropolitan population, give rise to a whole set of significant shifts that will profoundly affect the business structure, our daily life styles, and our value systems. Some of the basic shifts that are well underway are:<sup>5</sup>

- . From primary and secondary industries (agriculture/ manufacturing) to tertiary and quaternary industries (service/knowledge activities).
- . From goods to services.
- . From goods/services produced by muscle power to those produced by machines and cybernetics.
- . From materialistic to the sensate.
- . From "things" to experiences.
- . From physiological to psychological needs.
- . From scarcity to abundance and eventually to super abundance.
- . From a few stark choices to a bewildering array of choices.

- . From durability to disposables and planned obsolescence and back to recyclables, reclaimables.
- . From self-interest motivation to broader social and humanitarian outlook.
- . From independence and self-sufficiency to interdependence.
- . From individual freedom to voluntary restraints to mandatory restraints.
- . From Puritan hard-work ethic to leisure as a matter of right.
- . From atomistic to large-scale pluralistic institutions.
- . From national to multi-national and "one-world" scale operations.
- . From decentralization to centralization and eventual globalization.
- . From irrational chaos to futures-creative long-range planning.

It is against the backdrop of this multifold shift from an industrial (or modern) to a post-industrial (or post-modern) society that we must attempt to understand and to model phenomena related to population, technology, economic development, environmental preservation, and in general the "quality of life" for all people. To perform such an analysis in a useful and meaningful manner it appears that we need a "post-economic" policy science paradigm. This "new" paradigm will be useful in addressing very fundamental questions "about the nature and destiny of man, about his ideals regarding his own person, and even about what might be his own successor."<sup>6</sup>

To summarize, the apparent shortcomings of analyses performed within the context of the economic (classical) policy science paradigm appear to be:<sup>7</sup>



- . Not responsive to the multifold shift which represents a plausible alternative future.
- . Dominance of macro-economic modelling and data generation disregarding the role that values and attitudes play in making decisions at the highest level of policy-making.
- . Non-planetary, non-holistic, and simplistic policy analysis, downgrading the potentialities, and diminishing the options, of the world system.
- . Increase of the gap between the "two cultures" of science and the humanities by contributing to the presumption of the existence of a "technological fix" to fundamentally non-technological-solution problems.

In the next section the main attributes of a post-classical paradigm are described. This paradigm is conceptualized as being complementary to the classical paradigm just as relativity and quantum mechanics are complementary to classical Newtonian mechanics.

### III

#### Properties of a Post-Classical Paradigm.

The nineteenth century may be regarded as marking the culmination of our understanding of the large-scale behavior of matter under the conditions of ordinary experience. That century saw not only the completion of the science of dynamics founded two centuries earlier by Galileo and Newton but also the brilliant synthesis by Maxwell of the laws of electricity, magnetism, and electromagnetic induction into a complete theory of electromagnetism. Indeed, our understanding of the laws of nature appeared so satisfactory at the close of the century that many physicists foresaw a decline in what today we call "basic research."

Yet the very exactness and apparent completeness of the classical physical laws contained the seed of their downfall when they came to be applied outside the range of ordinary direct human experience.

When Maxwell in 1865, formulated his theory of electromagnetic waves, it turned out that these waves ought to exist in empty space. Now all wave motion with which scientists were familiar at that point of the evolutionary process required a medium for their propagation. So in order to understand and interpret Maxwell's work, scientists decided to adopt the idea that space is filled with an electrically rigid medium called the luminiferous ether whose ordinary mechanical density and viscosity are so small that the planets and even much smaller bodies can move through it without hindrance.

It appears quite reasonable that, if space is not really empty but filled with a rigid medium, there might be some meaning to absolute motion. In fact the earth's speed through this medium might be measured by comparing the speed of light in different directions. Such an experiment was carried out by Michelson (1881) and by Michelson and Morley (1887). These experiments were sufficiently sensitive that a speed of about five miles/second should have been detectable; yet, in spite of the fact that the earth's orbital speed around the sun alone amounts to 18 miles/second, no effect was observed. Many unsuccessful attempts were made to explain the null result of the Michelson-Morley experiment without wholly giving up the idea of an ether. Einstein finally proposed a radical approach which simply consisted of abandoning the idea of the existence of the ether, and returning to the principle of relativity, which asserts the impossibility of detecting absolute motion through space. This assertion led him to new properties of space and time and eventually to radically different results in kinematics and in dynamics, and several totally new and unexpected natural phenomena.

In the previous section we discussed some of the fundamental shifts that are occurring in terms of such phenomena as population explosion and planetary shrinkage, that represent significant evolutionary changes in the human condition. It, therefore, appears reasonable to assume that phenomenological changes of such magnitude and complexity must have major ramifications in our perception and modeling of reality. The time-development and interpenetration of

these phenomena exacerbate the need to invent and apply a new policy science paradigm.

Figure 1 displays the most important attributes of the proposed (candidate) paradigm, together with the corresponding attributes of the classical (economic) paradigm. Even though the post-classical attributes appear to be antithetical to the classical paradigm's attributes, they should be interpreted as complementary; i.e., if the system under consideration is in a pre-industrial state, then the classical paradigm should furnish a good approximation to the behavior of that system. This can be thought of as the classical limit of the post-classical paradigm.

It appears desirable now to describe a little more fully some of the main attributes or properties of the candidate paradigm shown in Figure 1:

- (1) Value-sensitivity. This property essentially recognizes the role values play in policy science. The quantitative bias of the classical paradigm coupled with the bias of reductionism and mathematical (algebraic) analysis, lead usually to component hypotheses and action, disregarding the totality of human experience. One of the guiding principles of the candidate paradigm must be to accept graphics as a proper symbolism in an effort to develop a "holistic" policy science language. There are three categories of values that are most often not taken into account in the classical utility calculus: (a) those values that are widely diffused over a continuously

TWO POLICY SCIENCE PARADIGMS  
(CHARACTERISTICS)

CLASSICAL

POST-CLASSICAL

CULTURE AND VALUE INSENSITIVITY	→	CULTURE SENSITIVITY
REDUCTIONISM (MATHEMATICAL ANALYSIS)	→	HOLISM (GRAPHICS)
PRODUCT (RESULT) ORIENTATION	→	PROCESS (BALANCE) ORIENTATION
FORWARD CAUSALITY (SHORT-TERM)	→	BACKWARD (TIME - REVERSED) CAUSALITY
RIGIDITY (INERTIA)	→	FLUIDITY (EPHEMERALIZATION OF THOUGHT AND STRUCTURE)
TIME AND SPACE INVARIANCE (HOMOGENEOUS WORLD)	→	SITUATIONAL MODELLING (CULTURAL DIVERSITY)
INSTITUTIONAL HIERARCHY (COMPETITION)	→	ECOSYSTEMIC HIERARCHY (COOPERATION)
ELITISM	→	PARTICIPATION
POSITIVIST (EXTRAPOLATIVE) PLANNING	→	NORMATIVE (DESIGN) PLANNING

FIGURE 1. MAIN ATTRIBUTES OF THE CLASSICAL AND POST-CLASSICAL POLICY SCIENCE PARADIGMS.

shrinking global space; (b) those associated with future generations; and (c) those not associated with human beings at all.

- (2) Time-reversed causality. In the classical paradigm the notion of causality as it relates to planning is conceived strictly in terms of a forward time flow that links a policy action in the present to an impact in the future. This notion of causality is also usually focused on "known options" and short-term results. It completely disregards the fact that short-term results usually cause long-term future consequences which are in most cases unanticipated and undesirable. In order to avoid the dystopian consequences of results, the post-classical paradigm postulates a time-reversed notion of causality, in the sense that an image of the future (as defined in terms of a desirable "consequence field") feeds backward in time into our "perceived reality" domain. This backward linkage of the future to the present is schematically depicted by Figure 2, which in addition to time-reversal incorporates in one planning framework some of the other properties of the proposed paradigm such as: (a) a "planning hierarchy" as represented by the three distinct levels of planning, i.e., normative, strategic, and operational;<sup>8</sup> (b) a "perceived reality" structure incorporating such conceptual elements as purpose, values, ends, and situation, (c) a "known options field" domain at the strategic level of planning

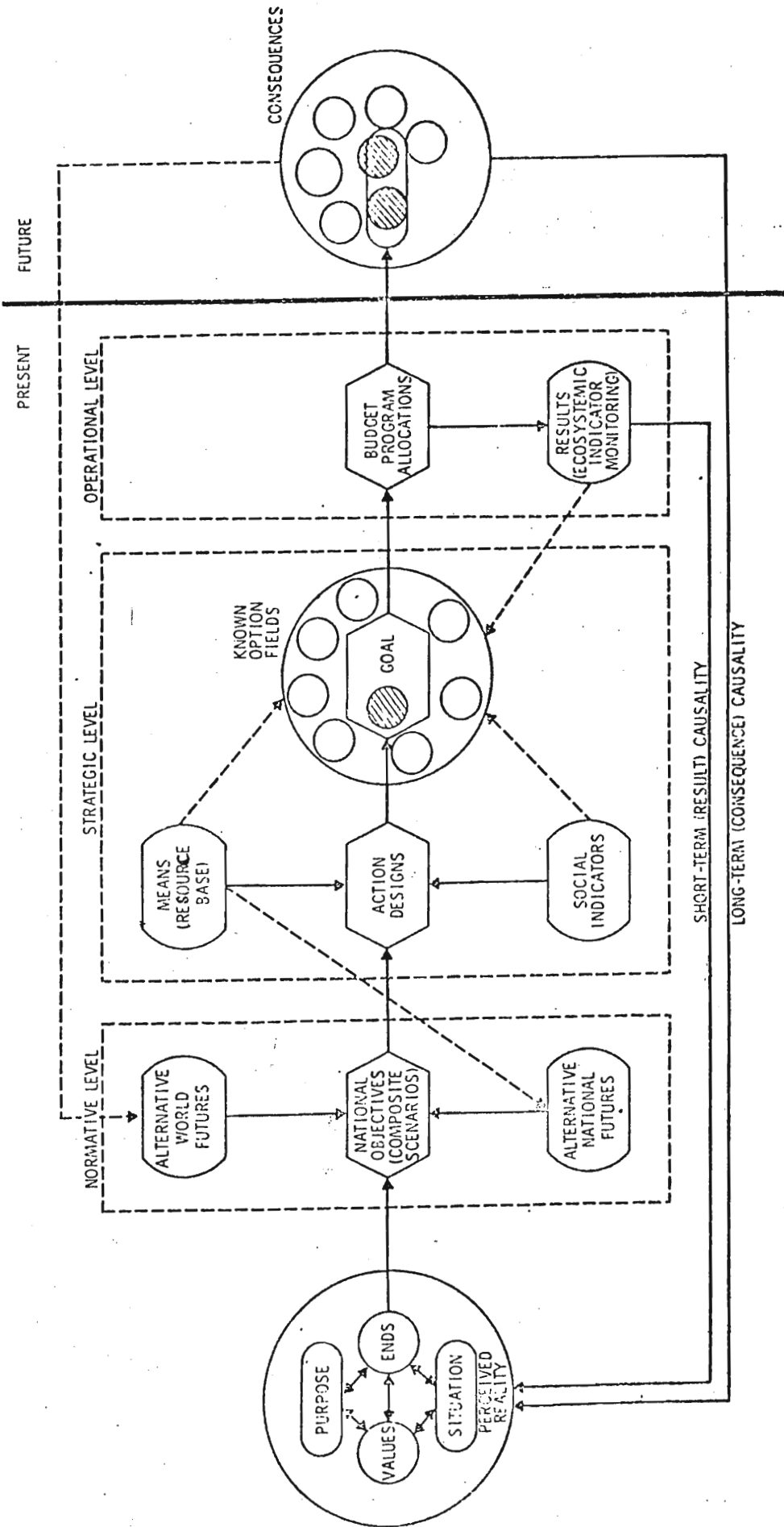


FIGURE 2. A PARTICIPATIVE - ADAPTIVE - HOLISTIC - PURPOSE - HIERARCHICAL - TIME-REVERSING PLANNING/ACTION FRAMEWORK.

which is useful for setting goals that define those desired results which are compatible with the "objectives" determined at the normative level; and (d) a process of public participation in the formulation of "objectives" at the normative level of planning through the exploration of alternative world and national futures.

- (3) Ecosystemic hierarchy. This property superimposes a multi-level, multi-goal geographic hierarchy on the three principal dimensions of policy planning, namely: (a) the axiological dimensions (or value space); (b) the phenomenological dimension (or "nature" space); and (c) the praxiological<sup>10</sup> dimension (or policy space). The implications of alternative policy-action configurations are mapped out on the phenomenological and axiological dimensions in order to assess their feasibility and desirability, respectively. These mappings are performed separately at each level of the geographic hierarchy starting from the "world scope" which embraces the "national scope" which in turn embraces the "metropolitan scope" and so on. Only those policy alternatives that satisfy criteria of feasibility and desirability at a given level of the hierarchy are passed on to the lower level for additional evaluation and elimination of the unacceptable (and unreasonable) alternatives.

To recapitulate, the main attributes of the post-classical paradigm are: (1) holistic, value-sensitive, and interdisciplinary analysis,



(2) long-term and time-reversed causality, and (3) ecosystemic hierarchy. These three attributes together represent the basic methodology for operationalizing the proposed paradigm in terms of decisions and actions by policy makers.

IVFinal Remarks.

At this point one might wonder what are the major differences, in terms of findings and recommendations, of a policy analysis performed utilizing the classical paradigm as compared to one performed within the context of the post-classical paradigm.

To illustrate this difference consider for example the phenomenon of population density. We hear statements that the United States is not crowded by international standards because compared to Holland the United States has a population density 18 times smaller. It is quite apparent that such statements are not very meaningful when viewed within a "whole system" context. The Netherlands actually requires large chunks of the earth's resources and vast areas of land outside its borders to maintain itself. It is the second largest percapita importer of protein in the world. It also imports all of its cotton, 77 percent of its wool, and all of its iron ore and other major minerals.

The "density fallacy," and other similar misunderstandings, are the result of the classical paradigm's inability to provide a context for: (1) the essential long-range (and time-reversed) horizon, and (2) the ecosystemic, hierarchical perspective which is imperative in performing analyses of alternative population control policies.

Depending on the adoption (or non-adoption) of the proposed paradigm we can envision two quite distinct societal scenarios for the world system:<sup>11</sup>

The "Closed" and "Inept" Society. By the year 2000, the mishandling of human and material resources -- energy, mineral ores, professional knowledge, etc., has resulted in a highly regulated, reactive, and extremely tense and suspicious society. Government consists of a dictatorship over which no one individual or group has any effective control. By continuously practicing the reductionist philosophy of the classical paradigm, and the insistence on technological fixes to non-technological solution-problems, society has arrived at a very precarious position that necessitates centralized control for survival. The lack of environmental safeguards has led to an irreversible degradation of the ecology to the point of threatening a serious ecological crisis. The educational system continues to promote and to reward specialized and product-oriented training. Free choice is very limited and strong pressures exist for conformance to a common "official" ideology. An illusion of free choice is preserved through emphasis on the escapism provided by various sport activities and similar recreational pursuits.

The "Open" and "Adept" Society.

Through effective and anticipatory long-range planning, as required by the post-classical paradigm, society has carefully

managed its limited resources, and hence can tolerate at the local level heterogeneous sets of cultures and ideologies. Emphasis is placed on maximizing individual choices and options. Distinctions among the role and functions of education, employment, and recreation have become blurred. Educational philosophy is holistic in nature, striving to prepare the citizen for a society which enjoys highly individualistic life styles but requires strongly participatory government.

In conclusion, we have tried to argue in this paper that the emerging demographic, economic, and cultural trends, especially in post-industrial societies, require the adoption of a post-classical paradigm. We have attempted to postulate such a paradigm, which has the properties of being value-sensitive, futures-creative, and entity-dependent, so that, given a specific situation, it is complementary to the classical paradigm, just as relativistic mechanics is complementary to classical mechanics.

It is our feeling that within the context of the proposed paradigm considerable research is needed: (1) to expand the notion of ecology to embrace the equilibria and the dynamics of all entities, and (2) to translate the candidate paradigm into operational terms by applying it continuously for decision-making purposes. It is also our feeling that international conferences such as this Rome meeting can play a significant role in propagating the adaption and evolutionary experimentation with the proposed policy science paradigm. We solicit your support.

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NOTES ON THE DETERMINATION OF HUMAN NEEDS  
IN ENVIRONMENTAL DESIGN

By James de Wilde

The intention of this paper is to raise certain questions about the dilemma of need-determination in political thinking. What a need is, what priority-structure should be attached to human needs, and how conflicts in interpretations between needs should be resolved are essential problems of political thought and action.

I would briefly like to deal with the conceptual difficulties pertaining to need-determination and the relationship to the expression of wants as these difficulties appear in subjective and in utopian designs. A truly visionary society having transcended scarcity economics will have the capacity to deal with the formulation of such problems in an entirely new vocabulary. The political dilemma might be how to reconcile 'wants' which have not traditionally been seen as 'political demands' into a formula whereby they can be handled by 'resources'. (I am thinking of such categories as 'effective participation', 'self-actualization' etc.). The ideal community would be one in which the wants experienced are generated by communitarian concerns and are accommodated harmoniously. Can we objectively determine what such needs are? Is artistic expression a need or a want?

Recent developments and discussions within North American political theory have brought such problems into focus. Having assimilated the commonplace that the consumer society generates false needs

through advertising and like-processes, political theorists are hesitant to suggest exactly what an authentic need is. I am not going to attempt a definitive answer to such a question, but simply endeavour to demonstrate that real needs can be said to exist within an ecological and anthropological framework and that political decisions must be based on such real needs as community self-determination, economic sufficiency (itself a difficult concept) and environmental health. How these needs are to be gratified through reconciliation with often-divergent wants is the theme of this paper. It is appropriate to note that movement away from the atomistic notion that the individual is the best determinant of his own interests has been most clear-cut in a discussion of environmental matters. Grappling with ecologically-based questions necessitates the focusing on interrelationships. Accordingly, policy-making must reconcile these apparently diverging tendencies towards centralization (global consciousness, design strategies) and decentralization (participation, the structuring of autarchies within communities).

In a recent article ("The Concept of Interest in Pluralist and Marxian Analysis", Politics and Society vol. 1, no. 2), Isaac Balbus writes (p. 153):

"...(T)he use of subjective interests as the sole criterion for evaluation leads to the perverse conclusion that there is no normative problem of political representation with respect to individuals whose life-chances are seriously effected by a given policy but do not perceive any effect..."

Similarly, although everyone agrees that subjective interests will in part determine a man's behaviour and that a focus on subjective interests is therefore essential for behavioural political theory, a sole focus on subjective interests ignores the social fact which our ordinary language recognizes that "it is precisely the presence of objective interests which prompts the emergence of subjective awareness"; i.e. that an individual's subjective interests are not merely GIVEN, or RANDOMLY generated, but rather are systematically determined by the way in which his life-chances are objectively effected by objective conditions."

The reliance on subjective interests alone is, of course, inadequate for the development of a political theory. Accordingly,

it is essential that a modern political theory understand the implications of the way in which needs are determined and understood in the policy-making process.

The clash between abstractly-determined needs and subjective wants is the basic problem of post-industrial instrumental politics. A job-producing oil exploration project off the coast of Scotland (wants of a community) versus the needs of a society for the maintenance of a coastline as a natural area. Or the wants of a community in Ontario to retain its countryside versus the needs of a growing metropolitan Toronto for a new airport. (Airport locations are in a sense the symbolic issue of modern politics. Who should decide on the location? The users of the airport, the community effected, some technocratically determined balance between the two? How can the need be verified? I must suggest in passing that an immensely rewarding (significant) piece of research would involve the study of the decision process in the location of airports in different parts of the world. Certainly, in Canada, the new Pickering airport for metro Toronto has been the focus of much debate.)

The priority needs fluctuate against a media-induced' ephemerality of issues. The concept of 'energy crisis' dislocates environmental considerations from public consciousness. The conflict of public expectations creates the tendency on the part of many to look for an arbitor-agency to regulate development. Although this can be of great benefit, there are difficulties involved. One example of this problem was explored in a recent article (in the Yale Review of Law and Social Action "Ecology versus Equality: the Sierra Club meets the NAACP") by Fred Bosselman. In a town in New York state, the municipality has been sued by two groups one (the NAACP) showing the prevalent pattern of local land-use discriminates against blacks. and the other (the Sierra Club) arguing that the land-use regulations are "ecologically unsophisticated, environmentally irresponsible". How do we determine the real needs of this



community (whose residents are quite affluent). Bosselman suggests that what is required, given the inadequacies of the courts is a central state land-use agency with "adequate staff and expertise". This notion is central to land-use planning legislation being introduced into the American Congress. Yet the wording contains within it the dangers of technocratic domination and a tradeoff in policies which leaves everyone dissatisfied. Is this tradeoff of a community's right to self-plan the only way of solving the larger conflicts between demands? (I must add that my research into the subject of land-use planning is very North-American centred and that I have not yet studied European handling of similar problems. I would be especially grateful for any suggestions and comments along this line.)

In the remainder of this paper, I propose to examine three recent works all of which can be broadly said to deal with questions of environmental planning. (The works referred to, which I have obviously found to be of considerable interest are: Tomas Maldonado, Design, Nature and Revolution: Towards a Critical Ecology (Harper and Row, New York, 1972); Barry Commoner, The Closing Circle Nature Man and Technology (Alfred A. Knopf, New York, 1971) and Mahmood Mamdani, The Myth of Population Control: Family, Caste and Class in and Indian Village (Monthly Review Press, New York, 1972).

Mamdani's solid investigation of a population planning group in an Indian village is an excellently-researched examination of a case study. The programme is an excellent case of a clash between the objectively-determined needs for a population control project in a region and the subjective interests of the local villagers for larger families (because of their requirements for many sons to make small-scale agriculture feasible). Mamdani writes that:

"The political and scientific reasons for the emphasis on overpopulation are, in fact, two sides of

the same coin. One follows from the other and the two sustain each other in a symbiotic relationship. If population control is to be a substitute for fundamental social change, then the theorist must look at the population 'problem' INDEPENDENTLY of the other aspects of social relations. It also follows that he must look at motivation." (p. 19)

Mamdani suggests that to understand "overpopulation" a new method must be designed which enables us to perceive that "the motivations of men and women originate in their social experience. Motivations do not exist in the abstract, their roots are to be found in a given social structure." (p. 20)

The question of Indian objective interests are clearly raised as a problem in Mamdani's study. The NEED to control the population is defined abstractly as a national planning strategy but a voluntary contraception programme fails because the urban social workers have no understanding of the subjective interests of the villagers. This subjective interest is defined by the immediate priority of increasingly family size because of economic interests. It is apparent that population cannot be viewed as an independent factor which can be planned IN ORDER TO at some future date in some as yet vaguely-perceived manner remedy economic ailments.

Barry Commoner writes in his conclusion to the Closing Circle (p. 298) that:

"There is, for example, cause for optimism in the very complexity of the issues generated by the environmental crisis; once the links between the separate parts of the problem are perceived, it becomes possible to see new means of solving the whole. Thus, confronted separately, the need of developing nations for new productive enterprises, and the need of industrialized countries to reorganize theirs along ecologically sound lines, may seem hopelessly difficult. However, when the link between the two - the ecological significance of the introduction of synthetic substitutes for natural products - is recognized, ways of solving both can be seen."

Conceptually, Commoner is a scientist. As a biologist looking at the environment, he discerns certain needs and

certain policies extenuating from such needs. But the policy involved in finding a unifying strand which extricates us from our contemporary difficulties is complicated. Again, it involves the problem of translating various subjective interests into the impetus to design in accordance with the objective (intersubjective?) interests. Ecological planning runs into this obstacle whenever it attempts to totalize on too grand a scale. A community of interests must be discerned within the policy-process to make unifying strands feasible. The reality of the failure of a population control programme or the demand of a Scottish fishing village for economically-prosperous oil derricks constantly thwarts grand schemes. And one is tempted to add 'thankfully'. For we must not plan on a global scale without taking into account such subjective interests, even if they appear superficially as being irrational. Such 'irrationality', as Mamdini suggests, is structurally appropriate. And the grand designers today are more likely to build super-airports in dairy-farming countryside than to not. The opposition to new airports at a community level is an intuitive response against the irrationality of automatic technological expansionism. It becomes necessary to organize such protest groups into a coherent strategy of criticism of societal priorities. This requires the utilisation of some technical knowledge: what alternative transportation policies are available which might obviate the necessity of constructing another Toronto airport. The development of a rational alternative transportation policy for Canada axiomatically involves more than just the residents of Pickering. Yet their initiatives may be the catalyst for the design of these alternative proposals, and the mobilization of the support necessary to force implementation of such proposals in the face of vested interest groups and bureaucratic policy-making inertia.

Building on conceptual principles of Gramsci and Ernst Bloch, Maldonado, in a stimulating essay, proposes a praxiology of design which is useful in a discussion of the problems of need-determination. He writes that (p. 67-8):

"The alternative to the abstract utopia of ideal models cannot be possibilistic capitulation; rather it must consist in the overcoming of the false alternative by means of a general theory of 'design praxis'. Such an organic complex of criteria directed toward innovative action should help us generate a fruitful relationship between 'critical consciousness' and 'design consciousness' within the specific context of recent capitalist society."

In a lengthy footnote to this passage, he adds:

"it is true that there are superstructural modalities and therefore diverse revolutionary strategies, that obviously must have a decisive influence on the definition of the role, or rather, as we shall see, of the roles -of the designer. Guided by Gramsci, one can say that the designer, inasmuch as he is 'an organic intellectual' that is to say, 'inasmuch as he is a 'commissioner of the dominant group' fulfills his task principally in the bosom of civil society and as a function thereof. But it is always a mistake to believe, as is usually the case, that the designer is always and necessarily a 'commissioner' of the dominant group already in power."

I interpret a praxiology of design in Maldonado's work as an attempt to achieve political planning without the painful transition into technocratic design-schemes, whether Stalinist or McNamaraist. My concern is to formulate, in this paper, extremely vaguely, an alternative theory of ecological politics for the society that is emerging today. Over-production, over-consumption, random development and rationalized systems theories have continued to create situations where the prevalent orthodoxy insists that impossible decisions must be made: we must be made to choose between energy shortages or environmental destruction, a grand design or decentralized randomness. The task at hand is to formulate a democratic theory which recognizes the community of interests between those non-technocratic designers (intellectuals, professionals) who explicate from the subjective interests of communities and individuals a rational strategy for environmental planning and the communities and individuals themselves. Autarchic communities are anachronistic, and rapid decentralization will perpetuate pockets of poverty amidst zones of conspicuous consumption.

It remains now necessary to focus on a strategy for

re form which is neither piecemeal (and uncoordinated) nor which replaces the abstractness of the technocrats with the abstractness of revolutionary blueprints. And the vital task of political theory must be the attempt to understand the relationship between wants and needs, subjective and objective interests, communities and the integrity of the ecosystem.

Towards this end, post-industrial society requires both policy (coordinating, centralized action) and praxis (the action at a decentralized level in smaller groups). Debates within communities must be intensified with regard to their roles within the larger community so that they neutralize any technocratic tendencies on the part of policies at the higher levels. We must remember that there is a perpetual tension within political decision-making with regard to what characterizes a human NEED. How can I say, for example, that as environmental health is a 'need', we must devise a transportation policy which minimizes the necessity of airport-construction? The need for policy which is globally responsible means that there is a converse need for greater local-level participation. This can only be done through an awareness of the convergence of interests within ecological realities.

How is such a convergence facilitated? The determination of needs must take place within a framework which provides for the effective articulation of subjective interests mediated by a concern for ecological (communitarian) values. Facile solutions such as radical decentralization or global design-schemas which 'rationalize' resource use in terms of some vaguely-defined 'objective interest' must be severely questioned. There is a need for participation as real as the need for a rational environmental policy.

The tension surrounding need-determination must be maintained. The Scottish village should not be left at the periphery of economic affluence - yet neither should new oil exploration be sanctioned

without a full attempt being made to devise an alternative industrial strategy for the region. The feasibility of such alternative strategies will be a direct function of the structuring of policy-making (priority-determination). The structure of that policy-making (i.e. the criteria employed) must be severely scrutinized in open popular forums.

In population control, land-use planning, environmental research, architecture and urban design, the question of how needs are determined is paramount. The ecological framework is the structure against which basic directions can be determined. It is imperative that the technocratic potential inherent in such ecological approaches be resisted. Within such a framework of debate, it can be hoped that such needs as environmental health, effective participation in a community's policies by citizens, and a fair distribution of material and aesthetic resources will emerge as the priority needs. Such a proposition may be a utopian faith in the potential of debate. However, the alternatives appear to be a priority-system which facilitates environmental deterioration, or a computerized benevolent dictatorship which determines the parameters of the realistic. Needs, like all abstract concepts, are best determined in praxis. Yet theory can play the part of formulating the directions required by contemporary reality, and the potentialities inherent within it. And at this juncture, nothing less is required of it.

## WASTE OF RESOURCE, RECYCLING IN THE ECOSYSTEM OF WORLD NATIONS

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The ecosystem of world nations is a recent arrangement of the community of world nations which has taken shape in the 1960's with the emergence of more than 40 new states (Ghabbour 1973). It is probably a useful working hypothesis to describe the groupings to which nations may be classified and the relationships which developed amongst them over the years, in the same way as a biological ecosystem is described.

The centrally governed state is now the form of political organization which dominates the globe and encompasses almost the whole of humanity. The centrally governed state began as a functionally successful form of social organization in the great river basins of the Middle East, India and China. The state was devised by the populations of these arid or semi-arid regions where the seasonally flooding rivers were the sole means of sustenance in order to maintain, regulate and control the daily life and needs of the agrarian societies which developed and settled there. The examples set by India and China were not very much influential beyond their borders because of more or less effective isolation. India was isolated by the Himalayas and China by the Gobi Desert and the Tibetan Massif. The Middle Eastern examples (especially the Egyptian one), on the other hand, were copied with continuous modifications by the Graeco-Romans, and from them by the Medievals. The first

noteworthy contact between Europe and India across the Middle East was by Alexander the Great. The second contact which was much more durable and effective was through the Islamic Civilization which bridged the Indian and Chinese cultures with the Medieval of Europe. Trade routes were established across Islamic countries between several points in Europe and the Far East and lasted for centuries. The Islamic Civilization was instrumental therefore in bringing the fruits of the Indian and Chinese cultures to the gates of Europe. It was through Islamic channels irrigating eastern and southern Europe that the Europeans learned about paper and gunpowder among other things from China and about the Indian achievements in mathematics. These links were a great step forward in the formation of the present ecosystem of world nations. Instead of a few isolated foci of unrelated states, people in the temperate latitudes of the Old World began to experience a series of innovations both in ideas and in material culture which sparked the Renaissance. Ever since the Renaissance, Europe became a leader in science and technology; for all intents and purposes, the European and European-type cultures are likely to remain leaders in these domains for a long time to come.

Trade with the Far East and India across Islamic lands which brought to Europe exotic goods was the motive for Europeans to explore the world; they thus made contacts with new lands and



new peoples. By the end of the 19th century, the last unknown inhabited continent, Africa, was under European rule. The technology that the Europeans gained between the Renaissance and the Industrial Revolution was used to subjugate the world. In the 20th century Europeans turned their military technology towards the Arab populations living in the southern Mediterranean and the Middle East. This was the zenith of colonialism.

What effect his expansion had on the world was that European social norms were forced upon societies leading a subsistence type of existence. The European form of government which was prevalent in Europe in the 19th century, the centrally governed state, was derived from a Middle Eastern example which evolved to fit an agrarian riverain population surrounded by deserts or semi-deserts. Innovations in forms of central governments all developed as a response to local conditions. In its final European form, it was imposed on the populations of the intertropical regions which had no actual need of such a form. Intertropical populations leading a life of subsistence agriculture or subsistence pastoralism following the rains have developed and perfected the tribe as the most suitable form of social organization under such conditions. They have elaborated and perfected the tribal system to fit local parietic conditions just as agrarian populations in temperate latitudes have developed the centrally governed state to fit their own local settled conditions. Before the age of colonialism, the world was divided into states and tribal lands. There was some trade between the two realms, as far as merchants or military expeditions could penetrate in search of very essential

raw materials (e.g. tin, copper), but most trade was within the realm of the states themselves. The dominant more highly developed state always absorbed raw materials from its surrounding more or less civilized populations of the peripheral less developed states and exported manufactured goods to them. With the advent of colonialism, which was the final and strongest surge of developed states in search of expanding their exchanges with surrounding populations, the example of the centrally governed state was carried all over the globe.

During the colonial period, the pattern of trade and trade routes was not very much different in kind from the one before colonialism. There was always the pattern of routes radiating from the dominant state and reaching out to its colonies or to another far away dominant state (McEvedy 1967). Only the colonies were mostly overseas and for this reason trade routes were much longer and spanned the globe. The dominant state still continued the same role of absorbing raw materials from the colonies and exporting manufactured goods back to them. The classic example is cotton that came from Egypt and India to Britain, was manufactured into textiles and was returned for sale in the colonies. It is noted that the level of secondary production in the colonial powers (e.g. textiles) was of a degree that could be assimilated by the colonies. Thus, whether in the old Roman type of colonialism or the more recent British (or, European) type, there was regular flow of matter in both ways. Cycling was ensured.

While Europe was engaged in exchange with colonies, European culture diffused east and west into Russia and Anglo-

America. Two distinct European-type cultures took hold there and benefited from the enormous available resources to become secondary producers in the same measure as European states controlling overseas colonies. By the time of decolonization, Europe was on the threshold of the Second Industrial Revolution. Types and forms of manufactured goods were raised to a higher level. Meanwhile, the former colonies tried to introduce industry but were able to introduce only the levels that obtained in Europe during the First Industrial Revolution. At the same time, the U.S. and the U.S.S.R. far surpassed Europe in production levels and were ascending to the status of superpowers. They were establishing and maintaining their position by the production of highly expensive and advanced technology. This is apparent in satellites, missiles, electronics, etc., which may be classified as tertiary production from the ecological point of view. This term should not be confused with the same term used by economists to designate services which are also dominant in the U.S.A. over agrarian and industrial activities.

With decolonization, European sets of social norms were imprinted upon their former colonies. Although these norms were not originally set up for tribal subsistence societies, they were adopted to a greater or lesser extent. When these societies obtained independence they adopted the form of government learned from their former colonizers, although they were not in actual need of it. But what was done was done, and no longer can a tribe exist without being surrounded by international borders. The world is now divided

into European-type states whose number is at least 153 covering almost the whole land area of the globe.

Trade patterns underwent profound changes during the last two decades in accordance with the expansion of the state form of government all over the globe and the subsequent disappearance of the subsistence tribe as an independent political unit. While trade in colonial days was between colonial powers and their colonies, it resembled a small and simple ecosystem composed of several producers and one consumer. Now that these former ecosystems have coalesced into a single large and complex one; it could be topped by secondary consumers (tertiary producers); it is composed of 130 - 140 producers (the Third World), 10 - 15 consumers (the "rich" nations) and 2 super-consumers, (the U.S. and U.S.S.R.).

It is a characteristic of the contemporary trade pattern that the bulk of European trade is in manufactured goods with the U.S. and the U.S.S.R. (Jalée 1968). Most of the Third World trade is in raw materials with Western Europe and Japan and most of Europe and Japan's trade in manufactured goods is with the U.S. or the U.S.S.R. The flow of matter is thus from the Third World as primary producers to the "rich" countries as secondary producers (and primary consumers) to the U.S. and the U.S.S.R. as tertiary producers (secondary consumers), Fig. 1. Most of this matter is used and then dumped or destroyed in wars. This does not preclude that the superpowers are important primary producers of some commodities, but this activity does not change their position on the top of the trophic levels.

It also does not preclude that the superpowers are relying on much primary production from the Third World. What is important is that the ecosystem of world nations in the last few years is much different in size, composition and relationships from before. In fact it is a totally new situation. A situation which needs appropriate studies for its supportive technologies, needed to ease the flow of matter in a cyclic fashion - as in healthy biological ecosystems.

While in the former simple ecosystems recycling of matter was ensured, the present trend is towards accumulation at the top. Hibbard (1968) cites that American city dumps receive annually more than 2.8 million metric tons of iron and some 180,000 metric tons of aluminium, zinc, copper, lead and tin. Compare this with, for example, the Egyptian annual production of 265,000 tons of pig iron (Mountjoy 1966). The iron dumped in the U.S. is thus almost sufficient for satisfying the needs of 10 developing countries. The accumulation of solid waste is injurious to the environment of the superpower, before it is to the rest of the ecosystem. Smith (1972, pp. 347 and 348) defines the injury in financial cost, wastage of valuable raw materials and pollution of the land. Much of this waste is glass, metal and paper. A great deal of the trash is the result of planned obsolescence designed to keep industry going. Industry in the U.S. generates 15 million tons of scrap metal and 30 million tons of waste paper annually. Smith goes on to say that recycling of materials would control environmental degradation and would reduce losses of mineral wealth to a point where the only new resources needed would be to replace natural

losses and meet new demand. Because of the almost complete absence of recycling, the U.S. mining industry is producing 1.1 billion tons of solid wastes and destroying 157,000 acres each year. But the American consumer, the supermarket and the corner stores have lost all interest in recycling. They are too rich to bother about it.

How is the Third World man expected to see his mineral needs wasted designedly? How can he accept exhausting his own reserves to speed up foreign industry and then end up in foreign city dumps? He will either hold back his raw materials for his own use or accept the deal grudgingly. Both solutions do not help the proper functioning of an ecosystem. Nations have to join the world ecosystem on the age-old take-and-give basis. Isolation or one-way traffic belong to the past when there was room for subsistence economy and there was limited demand from vast reserves.

What to do then with waste matter? Nobody wants it within its own country of origin. Can it just be left there while others need it? Should American industry slow down its consumption to reduce the output of waste? If the American society has no incentive to develop the technology of recycling wastes which to others are resources, shouldn't this waste be handed over to the Third World which has both incentive and cheap labour force?

It is this step which can ensure recycling in the new unified complex ecosystem of world nations. It is this step that will enable industries in developed nations to increase

their production rates without ruining their national environments. It is this step which will resolve the diseases of progress and will allow for peace and prosperity, because it will remove the major cause of confrontation and conflict, viz., the struggle over natural resources.

Superpowers :

Secondary consumers

Rich (developed  
nations) :

Primary consumers

Third World :

Primary producers

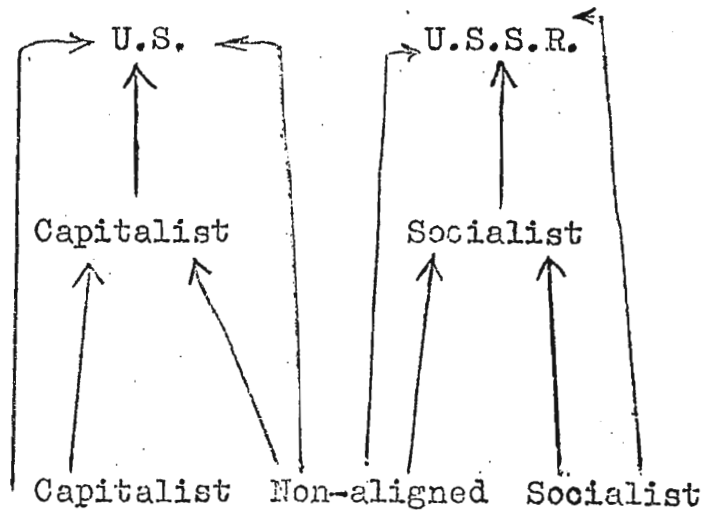


Fig. 1. Pattern of major trends in flow of matter in international trade, or the dominant relationships in the ecosystem of world nations.

Recycling is obviously very weak.

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PRINCIPLE OF SOCIAL STABILITY

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A MODEL OF INDUSTRIALISATIONPart I: General Principles

The reaction of both politicians and scientists to the publication of such documents as the Limits to Growth and the Blueprint for Survival has been truly frightening. The theme of these documents is simple and painfully obvious. Limitless growth cannot be sustained in a world of finite resources and with a limited capacity to absorb waste. This means that we must develop a society that is not geared to ever increasing growth, which is thereby less dependent on resources and which generates correspondingly less waste. It doesn't matter whether industrial society can be maintained for ten, fifty, a hundred or two hundred years. The fact is that it is moving in the wrong direction and at an exponential rate and the sooner the direction is reverse the easier will be the transition.

That all our scientists should not recognize this immediately and accept its implications shows that there is something very wrong with present-day scientific methodology.

One of its main defects is that it tends to regard observation and experimentation as the only scientific way of obtaining knowledge. This action has been taken so seriously that scientists have forgotten how to make use of theoretical material, so much so that they find themselves constantly carrying out experiments, at great cost, both in time and money, to demonstrate things which in terms of basic principles, are obvious and at the same time advocating policies that for theoretical reasons are not practicable. (1)

One doesn't need any experiments to show that one cannot

build a perpetual motion machine, since such a device would defy the second law of thermodynamics. Still less is it regarded sensible to advocate their large scale manufacture.

Neither does one need experiments, even if relevant ones could be devised, to show that chemical pesticides will not eliminate pests, that you cannot get rid of poverty by slum clearance, that industrial growth cannot be sustained for very long.

In each case, basic principles, some not yet properly formulated it is true, but nevertheless very difficult to deny, can be invoked, as they can to demonstrate the illusory nature of the main tenet of the religion of industrial man: that science, technology and industry can combine to create a materialistic paradise on earth from which can be eradicated all the ills man is supposed to have suffered from since the beginning of time, such as poverty, unemployment, disease, homelessness, crime and famine.

On empirical grounds alone, it is clear that our society is failing to achieve this paradise, as far from being eradicated these ills are everywhere on the increase, not only in the non-industrial countries but also in the richest industrial ones such as the United States. Thus in America there are now 25 million people who are officially regarded as poor while an equal number of Americans are displaying all the symptoms of malnutrition which one would have thought impossible in so prosperous a country. Indeed, if America cannot solve such problems with all its science, all its money, all its technology, how can any other country be expected to do so, unless of course there is no technological cure to these ills.

However unlikely this may seem to those brought up on the technological ethic, it is increasingly clear that this must in fact be the case. To demonstrate it, one must first of all examine economic growth as a process which is affecting the biosphere of which we are a part, and let us not forget that it has functioned very satisfactorily for thousands of millions of years without it. This process cannot be studied under "controlled laboratory conditions" as one cannot fit the biosphere into a test tube nor

can one understand the functioning of so complex a system by examining its parts in isolation from each other in the totally artificial conditions of a laboratory.

Current scientific methodology is in fact inadequate and is becoming increasingly so. The notion that information is obtainable by observation and experimentation means that one can only find out if something works by trying it out. When the things that one tried out were relatively harmless and their effect was small and localised, this technique, though not necessarily very useful, at least didn't do too much damage. When things one is trying out are on a massive, almost global scale and their failure can lead to wide-scale disasters, the methodology is no longer tolerable. For instance if Professor Harold Johnston's theory is correct and a sufficient number of SST's can destroy the ozone layer, thereby increasing worldwide levels of radiation, and eventually rendering the planet uninhabitable to human life, we simply will not have the opportunity to exploit this information in order to guide future aeronautical policy. In fact, never before has it been more important for science to fulfill what must be its only real function, that of interpreting and predicting change. To achieve this a more satisfactory methodology is required. Among other things it must involve postulating a thesis to explain different phenomena; that thesis which appears to fit in best with existing knowledge. This thesis can only be probable; it can never be certain. It must be accepted if it is the most probable and must be regarded as "true" if interpretations and predictions based on it are on the whole correct. In this case, to postulate a thesis must mean building a model of industrial society. Human society, it is essential to realise, is but a unit of behaviour or a system, and it can only be understood in terms of the behaviour of other systems at different levels of organisation. What one requires therefore is a general model of behaviour in terms of which one can attempt to understand the behaviour of an industrial social system. This is a big undertaking. I shall limit myself to stating what must be some of the basic principles of behaviour common to all systems, some of which have not yet been formulated. If these

principles were accepted and if it were generally realised that they applied to all societies, including ones of industrial societies, then it would become clear how we are all in fact trying to build perpetual motion machines. Indeed, practically all the major undertakings of our industrial society are impossible in terms of a general model of which a number of principles such as the following would provide the foundations.

### 1. The Principle of a System

A natural system is best defined as a unit of behaviour. Systems, regardless of whether they be cells or societies, have a great deal in common. The generalities, hence the basic principles, of their behaviour are the same. (2)

### 2. The Unity Principle

The biosphere developed as a single process; and must be regarded as a single system. This means that we cannot study its parts in isolation or for that matter in terms of the different disciplines we have developed. Another implication is that human beings, their families and the societies into which they are organised are not unique nor are they above nature as most of the literature on the social sciences implies, nor are they exempt in any way from any of the principles governing other natural systems. This means that the same methodology must be used to understand the behaviour of humans and their societies as is used to understand the rest of the biosphere. (3)

### 3. The "Man the Hunter" Principle

It is significant that for nearly 99 per cent of man's tenancy of this planet he has earned his living by hunting and gathering and his activities have been limited to the fulfilment of his normal ecological functions in his particular environment without in any way upsetting its balance, i.e. he has until extremely recently behaved as a normal differentiated part of the biosphere. It may seem strange but when we generalise about man, we must mean

"man the hunter". If man has existed for two million years, then his experience as an industrialist is not more than two days in the life of a man of seventy, in fact quite negligible, certainly far too short a sample on which to base any generalisations about the behaviour of man. (4)

#### 4. The "Original Sin" Principle

The hunter-gatherer mode of life appears to be the only one compatible with the maintenance of a climax ecosystem. Any departure from it must mean at least a measure of biological and social disruption. The greater the departure the greater the disruption. (See the Optimus Environment Principle.)

#### 5. The Principle of Economy

Behaviour takes the line of least resistance or of least effort. It is probable that the origin of life can be explained on this principle alone. Matter organised itself the way it did because it was the easiest course for it to take. Nature is consequently very efficient. It makes the minimum effort necessary to achieve its goal (stability, as we shall see). Efficiency in the technosphere is a very different thing. It means achieving the maximum output for the minimum input measured arbitrarily in terms of their market price which has nothing to do with their real biological and social cost. One of the most important implications of this principle is that systems and their mechanisms which are no longer made use of, i.e. for which there is no longer a niche, tend to atrophy - they can, in fact, be destroyed by depriving them of their function. (5)

#### 6. The Teleonomic Principle

Behaviour is goal-directed. Empiricist philosophers and scientists who insist that all knowledge is derived from observation refuse to accept this because no experiment can be rigged up in a laboratory that will either prove or disprove it. Unfortunately this also holds for most of the general principles governing behaviour

on this planet. It is also conveniently ignored because it justifies the deductive method. It establishes a generality from which particularities can be deduced without resorting to experimentation. It is ironic that if behaviour were random, i.e. if it displayed no order, and hence was not directive, the behaviour of dynamic systems (and all natural systems are dynamic) could not be interpreted or predicted (and it is the function of science to interpret and predict) and science would simply not be possible. (6)

#### 7. The Principle of Stability

The goal is the achievement of stability which can be defined as a course or trajectory on which discontinuities, i.e. disequilibria and their corrections, are reduced to a minimum, hence that ensures survival taken in its broadest sense. Human societies until recently satisfied this requirement. Their culturally determined goal was the maintenance of traditional norms, which were upheld by public opinion, the council or elders and the ancestral spirits. Stability is another word for continuity. It does not mean immobility as an immobile system would not be stable since it would not be capable of adapting to a changing environment. The importance of this principle is that it provides the only possible criterion for judging behaviour at all levels, i.e. in accordance with its contribution towards the achievement of stability. (7)

#### 8. The Principle of Self-Regulation

Stable systems must be self-regulating. They are maintained on their course by a control mechanism which in all systems regardless of their level or organisation functions on the same principle. Data are detected and organised (cyberised) to constitute a model of the relationship of the system to its environment. (In a social system this is usually referred to as its world-view). The responses are mediated in terms of it, otherwise they are random and the system is out of control. Also essential is that each of the constraints a self-regulating system is subjected to is subject to the constraints of the system as a whole, which means that the latter acts as a unit.

As soon as a system is regulated from outside (asystemically), the mechanism which is alone capable of assuring that system's responses satisfy all environmental requirements breaks down. It can no longer be kept on its optimum course, the course being determined arbitrarily by the external controller. It is significant that the behaviour of human societies has been until very recently entirely self-regulating. Primitive societies had no dictators or bureaucracies. They were run by tradition. They are often referred to as gerentocracies, government by the elders. I prefer "neocracrocies", government by the dead. As soon as institutionalised government takes over, the arbitrariness of the society's behaviour is painfully manifest.

#### 9. The Probability Principle

The cybernism, of which term I refer to all organisations of information to constitute models made use of by control mechanisms, can be regarded as probability calculators. The brain is no exception. What one sees, i.e. the hypothesis one formulates to explain one's relationship to a particular environmental situation, is the most probable one in terms of one's model. The notion of evidence, i.e. of an interpretation that is 100 per cent certain, is totally unknown in the natural world. Scientists, whether they know it or not, are also part of the natural world and none has ever formulated a hypothesis which is more than probable. One's policies and actions must therefore be based on those hypotheses which in terms of existing knowledge appear to be the most probable. One cannot do better than that. (8)

#### 10. The Continuity of Information Principle

Systems must be looked at four-dimensionally. They exist in time as well as in space and their continuity can only be assured if the information transmitted from one generation to the next (i.e. the generalities of the system's behaviour pattern) reflects the experience of the system as a whole, i.e. which temporally speaking means as far back in its evolutionary history as

the experience acquired is relevant to the conditions of the day. Only in this way are the constraints subjected to those of the system as a whole (which as we have seen is a sine qua non of self-regulation).

In this way a system is adapted to dealing with situations whose nature and the probability of whose occurrence can be predicted on the basis of the greatest possible experience and not just on that of the preceding generation. We know that this is true of genetic information. It is not generally realised that it has until recently also been true of cultural information. Education has until recently consisted in imbuing children with the traditional wisdom which will enable them to fulfill their functions as members of their families and communities and eco-systems. By breaking away from tradition, by elevating our scientists and other improvisors to the status of the priests of our industrial society, by putting a premium on change and originality, we are violating this basic principle which we only do at the cost of decreasing stability. At the other end of the scale, only the particularities of a system's behaviour pattern are developed on the basis of its own experience and constitute thereby differentiations of the original instructions designed to ensure adaptation to specific possibly short-term, environmental conditions. For us, the most important implication of this principle is that there is no substitute for the traditional society. It is only in this type of society that the Continuity of Information principle is not violated.

#### 11. The Optimum Environment Principle.

The optimum environment for any system - that in which it will be the most stable - must be that to which it has been adapted phylogenetically and ontogenetically. This means that as industry proceeds, as the technosphere replaces the biosphere, so must instability increase at all levels.



## 12. The Limits Principle

A system can be maintained along its optimum course only if change both to itself and its environment occurs within acceptable limits. It cannot respond adaptively to situations of which it has had no experience during the course of its evolution and whose nature and occurrence it is thereby incapable of predicting. It is significant that societies have only been able to maintain their stability in relatively unchanging or slowly changing environments and few primitive societies have been able to withstand dramatic changes such as those induced by contact with industrialised man. The limits can be organised hierarchically in accordance with their degree of generality (see The Hierarchical Constraints Principle).

## 13. The Counter-Intuitivity Principle

As a system's environment departs more and more from that which it has designed to deal with so must its interpretations and predictions become ever less accurate. Our normal intuitions, i.e. the mechanisms we developed to determine our basic responses to our environment must in such circumstances be increasingly unreliable. As Forrester puts it, our environment is increasingly counter-intuitive. As a result our responses are correspondingly counter-productive.

## 14. The Ecosystem Principle

A system does not develop in a random manner but as an adaptive response to a particular environmental situation. It must follow that it cannot be understood apart from this situation. The two must be studied together as constituting a larger, slightly less orderly system, one that is normally referred to as an ecosystem. This must be true regardless of the level of complexity of the system one is examining i.e., whether one is trying to understand the behaviour of a molecule, a cell, an organism or a society. An essential implication is that if one destroys the specific environmental

conditions to which a system is an adaptation, i.e. deprives it of its niche, then it must die. As the biosphere deteriorates this is rapidly happening to the world's larger mammals, including man. The converse of this principle is that if a niche is available a system will evolve to fill this niche. Our sprawling urban areas and huge stretches of monoculture must give rise to large populations of micro-organisms and insects adapted to the exploitation of such a niche and in terms of which epidemic diseases are alone explicable. (See the Principle of Selection.)

#### 15. The Levels of Complexity Principle

Behaviour does not proceed in a continuous way but in jumps. Critical points are reached when specific systems cannot further increase their complexity (see the Principle of Complexity) without going unstable except by associating with others to form a new one at a different level of complexity; thus atoms joined to form molecules, molecules to form cells. Also in the same way families join to form small communities (clans or villages) which in certain circumstances will join to form larger ones. The limit to the size of a particular type of system is probably set by the extendability of the bonds used to link together its constituent parts. In a social system these appear to be extensions of the family bonds and they will not extend very far. There appears to be a limit to the size of a society capable of acting as a self-regulating and hence as a stable system, and such a system appears to be quite small. A monolithic nation state is a relatively new institution and it does not satisfy these conditions in any way (see the Ecosystem Principle). Since the unit of study is the ecosystem, we should think of levels of complexity in terms of ecosystems: molecules plus their respective environment, cells plus their respective environment, organisms plus their respective environment, etc.

#### 16. The Generality Principle

Behaviour proceeds from the general to the particular. As most scientists today are concerned with particularities, generalities (being difficult to study in laboratory conditions) tend to be ignored and are often referred to disparagingly as "value judgements". Nevertheless it is they which are important. If the British army invades China what is important is not whether Sergeant Shooks has polished his bayonet but whether the basic principle of invading China is right. It is the first and most general stages of any process which should concern us most. The implications are obvious in medicine, psychology and education. It establishes the mother as the basic educator and not the school, let alone the university. (12)

#### 17. The Differentiation Principle

Behaviour proceeds by differentiation, A behavioural process cannot be understood solely in terms of the original instructions (except in the hypothetical situation of absolute order). These are adapted to local conditions at each stage, determining correspondingly differentiation behaviour. This further emphasises the importance of the early stage which will control all subsequent stages in terms of which they are differentiated. It also implies that subsystems are designed to fulfill different complementary rôles. To suppose that the members of a family, for instance, are equipotential and that the bonds linking them together are symmetrical either genetically or culturally (in a stable society) is to misunderstand the forces that determined the development of the family unit.

#### 18. The Principle of Self-Reliance

In order to ensure necessary supplies a system will not allow itself to become dependent on external sources of nutrients and other resources unless it can predict that supplies can be maintained. Ecosystems tend to become more and more autonomous as they develop.

Our industrial society, on the contrary, in order to exploit the so-called economies of scale, becomes more and more specialised and hence more dependent on external sources of supply, sometimes very unreliable ones, usually increasingly so, and on external markets for the funds with which to purchase such supplies, thereby violating this fundamental principle. (13)

#### 19. The Principle of Diminishing Production

As a system develops towards higher stability and eventually reaches adulthood -- or a climax situation, the rate of biological production decreases. This means that to maximise production -- as in a modern agriculture -- it is necessary to maintain the system artificially at a lower phase of development and hence at a more unstable one. The result is and must be greater discontinuities, i.e. more droughts, floods, pest outbreaks, etc.

#### 20. The Sequential Principle

Responses must occur in a particular sequence (succession). This is so because each one must be triggered off by the occurrence, or the prediction of the occurrence, of a situation which will be influenced by the preceding one. The more orderly the process (as in the development of an embryo), the more essential it is that the sequence be respected. Education or socialisation is a normal behavioural process and, as a child grows up, it acquires its basic information from the family unit. Subsequently it is subjected to the influence of its peer group and it is later let out in the community as a whole. Information is received from these different systems in the correct order. This order is critical if the child is to be properly socialised. In a stable society information from random sources extraneous to the system in which socialisation occurs (from television, personalities, films and most educational establishments) can only interfere with socialisation. The idea of education as subjecting a child to a massive barrage of non-selective data in no particular order, simply on the principle that the more knowledge

the better, is indefensible and an educational policy such as ours that is based on such a notion must be fatal to the survival of our society. (14)

## 22. The Accumulation Principle

Behaviour is cumulative. When new levels of organisation are achieved the previous ones don't simply disappear nor do they fuse with the new. They are modified by virtue of the fact that they are subjected to new sets of constraints but they are still there. This means that it is of little use to study behaviour at different levels of organisation by themselves. The main implication of this principle is the following.

## 23. The Hierarchy of Constraints Principle

All systems are subject to constraints. This is the same as saying that they are increasing order or reducing randomness. As each level of complexity is achieved a new set of constraints becomes operative. These can be organised hierarchically. The lower the level of complexity to which they correspond, the more they are important because the greater their generality (see the Generality Principle). Thus physical constraints apply to all systems. Everything obeys the laws of gravity, also the laws of thermodynamics. Biological constraints apply not only to biological organisms but to families and societies. Social constraints apply to all societies, however artificial. Our society is non-sustainable principally because its priorities are wrong. It puts economic constraints, i.e. those that are supposed to favour the distribution of resources within a system, before those that ensure the survival of the system itself and even subordinates to them physical and biological constraints.

The principle of 'Consumer Sovereignty', for instance, which states that everything must be subordinated to the satisfaction of the artificially induced material requirements of individual consumers, reflects this lunatic state of priorities, as does that of permissiveness, which implies that it is actually advantageous

to ignore that set of constraints that individuals must be subjected <sup>to</sup> if they are to fulfill their differentiated functions within their family and social systems.

#### 24. The Cyclic Principle

One of the most important ecological constraints at the physical, chemical and biological level of complexity deserves to be stated separately. Indeed in order to prevent the running down of our world and to permit the increase in order that has characterised the last few thousand million years, during which time our biosphere has developed, the raw materials of life have been exploited in a extremely subtle way. It is also applicable to ecosystems which are everywhere being simplified as monoculture replaces mixed farming and as herbicides fungicides and insecticides eliminate "unwanted" species. One does not need any laboratory experiments to tell us the result can only be to increase instability and hence discontinuities such as "pest" epidemics.

#### 27. The Principle of Complexity

The precision with which a system can adapt, is the extent to which oscillations (disequilibria and their corrections) can be reduced in a given situation depends on its complexity (both temporal and spatial). For instance, in an ecosystem, by increasing the number of trophic levels or levels of predation, new qualitative and quantitative controls become operative which must reduce the size of population oscillations occurring through disease and famine -- hence increasing stability. It is to be noted that society in accordance with the principle of Economy, will display the minimum complexity required to deal with environmental challenges. Also its complexity is limited according to the Levels of Complexity Principle -- thus if increasing complexity is at the expense of its basic structure into families, small communities, etc. it will cease to display order and will become unstable. (See the Principle of Order). It is significant that the technosphere which we are

substituting for the biosphere is not as complex as we think. In fact, by nature's standards it is rudimentary. The most sophisticated piece of equipment devised by man is far less complex than an ordinary virus.

#### 28. The Principle of Order

The most adaptive situation when no predictions concerning environmental changes can be made is randomness (which I shall take as synonymous with entropy) or an absence of order. As it becomes possible to discern some orders in the environment and hence make interpretations and predictions concerning likely changes, so does order build up. Order is organisation, a departure from randomness. Not any organisation but that which most favours the goal of stability. The technosphere does not display order as its organisation is not homeotelic (see the Homeotelic Principle) or self-regulating and hence tends towards increasing instability. In the same way a modern state, however centralised, does not display "order". The most adaptive organisation when predictions can be made with total accuracy (assuming this were possible) would be a system in which the steps succeeded each other without change of any sort, i.e. in which a pre-established response were replicated. I regard this latter situation as displaying the highest possible order. Needless to say, it can never occur. But order will increase as we move from the situation of no prediction to the theoretical situation in which infallible predictions are made. We think of order as synonymous with centralisation. This is apparent in the case of a system displaying high temporal complexity using an informational medium permitting rapid cybernisation and responses, such as the day to day behaviour of a human organism with a centralised nervous system, or that of an army. It is less apparent but equally so in a system made up of generations of amoebas in a stagnant pool or, for that matter, of Australian aboriginal hunters-gatherer societies. It could also be regarded as displaying high centralisation since the original instructions were handed out a long way back and have scarcely been modified since. This fits in with the normal criterion

of order -- the extent to which a system can be understood in terms of its generalities or basic instructions. It is to be noted that a large society will be made up of communities subjected to different environmental pressures in order to respond adaptively to which they must evolve divergent behavioural traits -- thus a centralised society is likely to be unadaptive.

#### 29. The Principle of the Optimum Strategy

There must be an optimum value to every variable representing a strategy exploited by a system to achieve stability. No such strategy is desirable per se. Therefore there is no possible reason for maximising any one of them. On account of the principle of economy, the optimum will in fact coincide with the minimum required for dealing with environmental challenges. Only a self-regulating system which is linked by feedback-loops to all those parts of its environment whose behaviour can affect it, is capable of maintaining itself along the optimum course that provides the best compromise between environmental requirements. Our society, needless to say, is geared to the maximising of such things as education, prosperity, number of housing units, productivity, etc. Such aims (even were they tending in the right direction) would be incompatible with the maintenance of a stable social system.

#### 30. The Principle of Competition

Competition is a mechanism whereby systems organise themselves hierarchically in accordance with their ability to fill available niches. It permits thereby the establishment of order within the larger system. If a system is tending towards stability, the greater the competition the greater the hierarchy (which is synonymous with order). If, on the other hand, it is tending towards instability, the greater the competition the greater will be the extent of the organisation tending in the wrong direction and the faster will it move towards its ultimate collapse. In



our industrial society, the greater is competition the more long-term biological and social considerations are subordinated to short-term 'economic' ones.

### 31. The Principle of Selection

Selection is competition looked at from the point of view of the environment. It does not only occur among mutants or random changes. It occurs also -- and primarily in fact -- among adaptive, i.e. controlled responses. Such responses can be regarded as selected by the environment in the sense that their rôle is to satisfy an environmental requirement and if there were no such requirement there would be no response. It is precisely because there is no environmental requirement for the mutants, accidents or random responses that they tend to be eliminated (see this principle within a society or a population may appear disagreeable to us.)

We tend to refer to it as discrimination against the genetically and culturally unadaptive. Yet there is no alternative save the development of a population or a society displaying increasing entropy and eventually breaking down. To encourage the latter appears to be far more immoral than to accept the basic principle that man is subjected to selection like all other forms of life. Measures tending to prevent the operation of selection by feather-bedding the unadaptive, i.e. via the welfare state, must correspondingly reduce social stability by increasing entropy or randomness. If we decide to adopt them, then we must be prepared to pay their cost.

### 32. The Homeotelic Principle (from the Greek "Homeo": same, and "telos": goal.)

If a system is capable of running itself then its parts or sub-systems at all levels of complexity must be tending towards the same goal. If they were tending towards different and incompatible goals the system would break down, unless of course

an external force were introduced to hold it together. However, it would then cease to be self-regulating, would become unstable and eventually collapse. If the parts are capable of behaving homeotetically it is because they were designed that way by differentiation. This applies equally well to human beings who have been designed phylogenetically and who in a stable society are trained culturally to fulfill their different functions as differentiated members of family and community systems. It can only be expected that a man will obtain the maximum satisfaction by fulfilling such functions as a husband, a father, a son, and a member of different social groups. This explains the counter-productivity of 'progressive' education, which is based on Freud's totally mistaken notion of society as frustrating and inducing neuroses. It is also clear that it is only if its members behave homeotetically in this matter that a system such as a family or a community can survive. In our society everything is done to impair homeotely at both the family and communal level. Women are encouraged to take jobs, put their children in crèches and so neglect important maternal functions. Worse still, they are subjected to an education which places no store on the fulfilment of such functions (in which many of the household tasks that have previously provided people with undoubted satisfaction are classified as "drudgery" by those who wish to draw the housewife more directly into the orbit of the cash economy). Also the father is prevented from fulfilling his essential functions as protector of and provider for the family by the all-pervading welfare state that takes over the education and the health problems of his children. Similarly homeotely is being impaired at the communal level, since people are being systematically taught that it is the duty of the State to satisfy all their requirements including the most superficial, while the spirit of duty and participation in social affairs which alone insured the survival of stable societies in the past is discouraged in every way. In other words, the introduction of external controls on the massive scale at which they now operate in a modern national state must impair homeotely and hence disrupt the self-regulating mechanism which are alone capable of insuring stability in our family and social systems. (15)

33. The Heterotelic Principle (from the Greek "heteros": different, and "telos": an aim or goal).

As a system disintegrates, so it fails to provide the appropriate stimuli required to trigger off the homeotelical responses on the part of its members. The responses that the latter will trigger off will be heterotelic, tending toward different goals from that of the system as a whole and incompatible with them. Thus, to return to the family as it disintegrates the husband might leave his wife for a mistress or resort to various forms of retreatism such as alcohol or drugs, all of which might provide him with personal satisfaction but do nothing to hold the family together. As a result, the family would disintegrate still further until it eventually ceased to constitute a system capable of autonomous behaviour. This is what is happening today.

The extended family which displays complexity and order has already disintegrated into the unstable nuclear family, which in turn is further disintegrating into its constituent parts, the process being most advanced in the ghettos of the large urban agglomerations in America and elsewhere.

34. The Accommodation of Trends Principle

A heterotelic response is not solving a problem, only suppressing one of its manifestations, thereby rendering it more tolerable, and contributing to its perpetuation. Thus the tranquilizers that are now dispensed in astronomical quantities do no more than render man's plight as a member of a disintegrating family, community and ecosystem that much more tolerable, serving thereby to perpetuate the process of industrialisation that has actually put him in this plight. Most of the so-called services provided by industrial society fit within this category. Houses for the old are only necessary with us because the family unit has broken down and people have lost their sense of responsibility towards their parents, which leads them to exile them to such institutions. To provide them is simply to accommodate this tendency and so it is with crèches for children who should be looked

after their own mothers. So it is with most of the welfare which, in a stable society, is dispensed at the family level, where it must cause the minimum disruption. So it is with most of the consumer goods people are acquiring in ever greater quantities because their acquisition satisfies a heterotelic goal structure, a substitute for what which is normally provided culturally but the family and communal environment.

### 35. The Problem-Multiplier Principle

Heterotelic responses, by tending towards the satisfaction of a single requirement to the exclusion of all others, must give rise to more problems than they solve. In addition, external or heterotelic controls, by their very nature, must render systemic ones redundant, which in accordance with the Principle of Economy must cause them to atrophy. Pesticides will thus destroy the natural controls on insect pests; artificial fertilisers nitrogen-fixing bacteria; in social systems centralised bureaucratic controls such as those operative in Western type nation states must destroy social structures and consequently society's capacity for self-regulation. (16)

### 36. The Solution-Multiplier Principle

On the other hand, by setting about to reconstitute or imitate the environment to which a system has been adapted phylogenetically and ontogenetically, one is ensuring the increasing stability and hence the better functioning of very many more than one specific system. Homotelic responses will thus do far more than solve those problems one may be temporarily concerned with.

In fact, as they are adopted so must other systems temporarily in disequilibrium fall back into place, for so will the biosphere function that much more closely to the way it was designed by thousands of millions of years of evolution.

Only homotelic measures, which reduce rather than increase man's impact on ecological systems (physical, organic and social)

thereby reducing systemic disruption at all these levels, can provide real solutions to the problems of man.

### 37. Conclusion

Induction and experimentation do not permit us to understand the world we live in. This can only be done by arguing deductively from basic principles. If we do this, it becomes apparent that man's problems have been totally misinterpreted by the scientific world. They are not due to a "lack of development" calling for further research, technology and industrial development. The opposite is the case. They are the result of a systemic deviation from man's optimum environment -- that to which he has been adapted by millions of years of evolution. This deviation started with the neolithic revolution and has accelerated with the development of industry. Further development, i.e. further deviation from the optimum, can only increase these problems while their solution must reside in developing that way of life and reconstituting that environment which, in the very unfavourable circumstances in which we find ourselves today, most closely imitate the optimum.

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## INNOVATION FOR DEVELOPMENT.

## ENVIRONMENTAL POLICY AND DEVELOPMENT POLICY

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Human history has reached a turning point where the survival of mankind has become a subject of national and international politics. This new perception is manifested by the threat of the hydrogen bomb as well as by the risks involved in an overexploitation of the biosphere. All over the world we must apply more circumspection and care in assessing the consequences of unscrupulous industrialization and mechanization. Things that are technically feasible must not necessarily be practicable in future. Only through more profound knowledge, greater international solidarity and prudent systematic action will it be possible to secure for all people on this planet a better life in an environment which will meet human elementary requirements and hopes for social justice more efficiently than under present conditions. The Bill of Rights must be expanded in a Bill of Rights for Mankind, including a fundamental right of every citizen on this earth for a minimum standard of life in decency.

Owing to its global reference to the Ecosystem Earth, any environmental policy is inseparably linked with peace research, peace planning and peace policy. To safeguard, maintain and enhance a decent human environment has become an objective for all mankind, as has been impressively manifested by the results of the Stockholm Conference 1972, which have been endorsed by the General Assembly of the United Nations. This objective can only be reached in a climate of social, cultural

and economic growth, which will require the prosperous countries to make more energetic efforts in their development aid and to adopt new forms of co-operation on a worldwide scale. The motto of Stockholm - "one earth" - should not remain a mere declaration but should be transformed into practical plans and concrete measures of national policy and international co-operation. Innovation for Development must start with the translation and transformation of scientific findings into policy action. This calls for a second generation of science policy: action and future oriented.

This means in detail:

1. The authority and efficiency of the United Nations and its Specialized Agencies must be consolidated and strengthened.

Whereas the United Nations, under the predominance of the super-powers, had formerly been a place to debate East-West controversies, it has now become a forum for the discussion of North-South problems. The priorities of the poor countries are the priorities of the United Nations family. The Group of the 77 holds the majority in the General Assembly and in the UN Programs; it does not grow tired of pointing out the injustice of the international economic system and the need for a root-and-branch reform - the last time it did so was at the first session of the Governing Council for the United Nations Environmental Program (UNEP) in June 1973. This situation has led to a growing indifference on the part of the U.S.A. and the Soviet Union with regard to the programs and work of the United Nations. It should be one of the aims of the Federal Republic's policy of détente - i. e. a kind of second phase of that policy - to make joint efforts with the EEC and its partners in the North and in the South in order to stop this development impairing the authority and efficiency of the United Nations and to re-route it towards a vitalization of the United Nations Organization and its Specialized Agencies.



In all negotiations, bilateral and multilateral agreements and programs, it should again and again be made clear to the super-powers that there is no alternative to the UNO, let alone the solution of the environmental crisis.

2. It must be the first and foremost aim of all strategies pursued in the solution of environmental problems in the poor and in the rich countries to secure the material prerequisites of life for every human being on earth.

For centuries the environment has been manipulated, utilized and changed in the interest of man's life and survival. This continuous interference with the natural resources has only recently become a critical global risk for all mankind as a result of industrialization and consumption induced by prosperity.

Environmental problems manifest themselves in a totally different way in the poor and in the rich countries. To more than a thousand million people the environmental problem means starvation, malnutrition and unemployment. There is a lack of schools, hospitals and jobs. Illness and inadequate food control are the result of poverty and ignorance. The standard of living of hundreds of millions of people defies any rational definition of human dignity.

On the other hand, in this and other rich countries the environmental problem presents itself as a conflict resulting from abundance. Valuable raw materials are being thoughtlessly wasted. Steadily growing material wealth is inevitably linked with a rapidly increasing turnover of matter and energy. Contrary to the situation in developing countries, sufficient planning capabilities, experienced administrations and a whole range of environmental protection technologies are available in order to cope with environmental problems without seriously impairing the achieved level of prosperity.

Therefore, environmental policy in a highly industrialized country must always be embedded in a concept of international co-operation which takes account of the particular situation of developing countries in

any national action taken for the protection of the environment: inter alia, by regularly reviewing national environmental projects for their international impact and suitability; by supporting environmentally sound strategies of growth in developing countries (also through the development and testing of simple "soft technologies"); by affording marketing chances to low-pollution products from developing countries; by removing impediments to the conveyance of technical knowledge and practical know-how in the environmental field to developing countries; and by carrying out an examination of environmental compatibility (environmental impact statement) for development aid projects and schemes.

3. The aims of growth must be reconsidered all over the world.

The thesis of the necessary "zero growth" advocated by certain ecologists may be misinterpreted. It has a ring of cynicism to those countries where the annual per capita income is still far below 100 dollars. The certainly necessary long-term transition from social economy to social ecology does not imply a stagnation of growth but its restructuring towards "service" and "knowledge" industries, which means qualitative growth in a social and cultural respect. However, such restructuring will in particular have to aim at a worldwide horizontal balance of development. The still inadequate and not even achieved target of the Second Development Decade under which the economically advanced countries are to make available to the developing countries 1% of their GNP per annum, is a first and very modest step in this direction which will have to be followed by further and more generous assistance. Moreover, the balance of development should always be regarded as a contribution towards securing international peace and eliminating conflicts and injustice in the world. In this connection, mere reference should be made to the effects which an earnest worldwide balance of development may have on the policy of stability. This balance constitutes an essential prerequisite for the creation of those minimum conditions which are required for improving the quality of life on this earth. This means, however: the attainment of a level of development in the poor countries of the world which is in harmony with the minimal demands of human

dignity is not possible without continuous growth in developed and less developed countries; on the contrary: in order to achieve a genuine balance of development involving fixed rates of increase in the budgets of the rich countries, the gross national product obtained in these countries must exceed the amounts of the past. Stagnation of growth in the rich countries could only result in a decrease of development aid.

Developing countries should be encouraged to seek their own strategy of growth which should avoid the mistakes and follies of industrialization of a Western European and American blend which has so often been blind to social needs. The development of infrastructure should go hand in hand with the provision of new production capacities. Production systems beneficial to the environment, interim technologies making use of location and labor market advantages as well as new forms of regional co-operation constitute further elements of such a strategy aiming at other large-scale technical targets of growth than the traditional ones. This must not be misunderstood as advocating a second-choice "poor people's technology". The distrust of the developing countries regarding "ecologic strategies of growth" such as they have been suggested by the Club of Rome or in the Memorandum "Blueprint for Survival" by British biologists, can be very well understood. As long as one-third of the world population controls about 85% of the world capital and consumes more than 80% of the energy and raw materials produced, it will be difficult to recommend to the developing countries to adopt economic policies beneficial to the environment or to convince them of our newly gained notions of a better quality of life, the more so since we now look back upon 100 years of impetuous economic development. Against this background, the unanimous approval of the United Nations Environmental Action Plan by the developing countries is particularly remarkable, since it is the poor countries of which this plan demands understanding and sacrifices in addition to the many problems they already have to face.

4. The environmental problem calls for planning on a universal scale and on the basis of a new Environmental International Law.

Changes in the biosphere caused by human interference and permanent overexploitation have had consequences for all mankind which cannot yet be fully assessed in their implications. The earth's capacity to produce vital renewable resources is impaired. Drinking water supplies for future generations are threatened. The rapidly progressing pollution of the oceans is jeopardizing their function as producers of oxygen which provide for a compensation of environmental damage occurring on the mainland. The heat released in the process of power generation, together with air pollution, changes the heat balance of the atmosphere and possibly also affects the climate of whole regions. Only by careful planning on a universal scale will it be possible to ward off these dangers to mankind. Instruments of international law designed to secure the ecological preconditions for life and survival on this earth must be the basis of such planning.

The code of a new Environmental International Law is outlined in the Declaration on the Human Environment adopted in Stockholm. The Stockholm Declaration in particular establishes the fundamental right of man to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being. The Universal Declaration of Human Rights of December 1948 and the constitutions of all states of the world should be supplemented accordingly. The right to an environment in the best possible condition is a challenge to the states and induces them to place the ecological foundations of life under the protection of the law and their full state authority.

The Principle 21 of the Stockholm Declaration also will soon have to be transformed into international and national law. According to this Principle, each state has the responsibility to ensure that activities within its jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national

jurisdiction. Corresponding to the liability regulations applying in air traffic or in the field of nuclear energy, the international law will have to be further developed with regard to liability and compensation for the victims of pollution and other environmental damage.

Internationally uncoordinated pollution control measures may impede international trade and commerce, but they may in particular continue to deteriorate the competitive position of the developing countries. If the industry of a state is charged with the costs of "soft" technologies, it is placed at a disadvantage in international competition. Within the framework of the GATT, it will become necessary to define non-tariff trade barriers resulting from environmental impacts. In this connection a policy of the "cheap flags of environmental protection" must be prevented.

Pursuant to the Resolutions of the Stockholm Conference, three new international conventions have already been adopted and ratified by many countries:

- the Convention concerning the Dumping of Wastes on the High Seas;
- the Convention for the Protection of Natural Resources and the Cultural Heritage of the World;
- the Convention on International Trade in Imperilled Species of Animals.

The Treaty of 5th August 1963 on the banning of nuclear weapons tests in the atmosphere, in outer space and under water has been concluded in the desire to put an end to the contamination of the environment by radioactive substances.

About a dozen conventions on the environment are being prepared, inter alia, for the preservation of fish resources in the sea, for protection against the effects of pollution on the macroclimate, and for the establishment of a global monitoring and warning system for the protection of the environment.

A significant characteristic of the community of nations bound by international law is that this community is not subject to any centrally established binding standards. In order to become enforceable, any matter of international law must be transcribed into national legislation. The centralized establishment of standards and their enforcement by acts of sovereignty are only possible within the framework of supra-national communities such as the European Economic Community. It will therefore not be sufficient to continue the development of international law in its traditional form. More than up-to-now multilateral treaties similar to the Test Stop Agreement and the Conventions on Oil Pollution should be concluded. By such agreements new practical international working instruments should be created: international research programs, taking over follow-up projects from UN organizations in the form of sponsorships, models of horizontal co-operation below the governmental level, universal master plans for the reduction of environmental pollution with regional steering bodies, multinational projects for the improvement and development of the environment.

Every development strategy and environmental strategy needs clearly defined legal foundations. The world public opinion in environmental matters which has developed in the meantime rightfully claims that the legal concept 'humanity' should be acknowledged as a supreme legal principle which consolidates all fundamental and human rights in a pre-statal law. This new legal concept has for the first time been applied in the UN Resolution 2574 of 15 December 1969, which declares the bottom of the sea to be the heritage and property of all mankind. It is logical that the bottom of the sea, space and important nature reserves should be placed under UN administration, so that, at last, direct sources of income of its own may thus be opened to the United Nations.

5. The way in which man lives is the subject of worldwide and national environmental planning.

The physical and natural environment of man cannot be seen in isolation from his social and political environment. All processes changing the physical and natural environment have their origin in the way in which human beings live, manage, and consume. If the threatening global dangers to the environment are to be combatted at their roots and with lasting effect, the socio-economic processes and habits of life causing such hazards to the biosphere and the natural resources must be changed. Thus the object of environmental planning will invariably be found in the industrial culture as such with all its specific features: urbanization, mass production, belief in technical feasibility. What will have to be changed are value concepts and objectives in society as a whole. This will in particular require the recognition of the limits set by the laws of nature. Water cannot be replaced by anything else, and there is no artificial water. Soil is not inexhaustible and is not available for any kind of use. If pollutants are emitted into the atmosphere in excessive quantities by industry, motor-vehicles and domestic heating, man will fall ill and suffocate. It seems that nature is taking revenge for the flaying it has to suffer.

As long as in rich countries with many possibilities of information and education, the awareness of the need to minimize interference which biological processes is as yet so underdeveloped, we can hardly expect such keen environmental awareness to exist in the developing countries. A great political and moral effort should be made in all parts of the world in order to ensure that the environmental compatibility of an investment or activity will become a natural requirement to the same extent as it is the case today - after a long struggle - with social justice, technical reliability or freedom of opinion.

The necessary planning of the way in which we live will only be possible in all countries of the earth if these ecological perceptions have been generally acknowledged. Environmental planning in this sense calls for new responsibilities, new argumentative planning techniques open to all fellow-citizens, but in particular for a new

pattern of orientation for economic policy. Growth must be optimized in harmony with ecologic needs. Basic materials and energy must be preserved and safeguarded, if necessary, by special taxation in the case of production using much energy and raw materials. If a serious approach is made towards such kind of environmental planning, some of the growth-engendered advantages enjoyed by the rich countries vis-à-vis the poor countries will gradually disappear.

At the same time there is a citizen's right to plan to be partner in the planning process. Only by motivation and understanding by all citizens will there be a chance for innovation for development. We have to change the terms of reference in which we live in by concrete living experiments to prove change is possible. Future Research could define and test models and patterns how to innovate for physical and ecological survival.



# SCIENCE

## Movement for Survival

John Platt

## Movement for Survival

**This Endangered Planet.** Prospects and Proposals for Human Survival. RICHARD A. FALK. Random House, New York, 1971. xiv, 498 pp., illus. \$8.95.

**Building the City of Man.** Outlines of a World Civilization. W. WARREN WAGAR. Grossman, New York, 1971. xii, 180 pp. \$10.

**Blueprint for Survival.** EDWARD GOLD-SMITH, ROBERT ALLEN, MICHAEL ALLABY, JOHN DAVOLL, and SAM LAWRENCE. Houghton Mifflin, Boston, 1972. xiv, 190 pp., illus. \$4.95.

**World without Borders.** LESTER R. BROWN. Random House, New York, 1972. xviii, 395 pp. \$8.95.

**The Mature Society.** DENNIS GABOR. Praeger, New York, 1972. viii, 208 pp. \$7.50.

Something like a world survival movement may be what we need next, and in fact it may be larger already than most of us realize. In the last two years, the global analyses and calls to action have been building up, including the five books here, along with the more technical M.I.T. studies such as *Man's Impact on the Global Environment* and *Man's Impact on the Climate*, and the Club-of-Rome-sponsored study by Meadows, Meadows, *et al.* on *The Limits to Growth*. Overlapping analyses emphasizing the political and cultural changes involved in world transformation would also include Servan-Schreiber's *The Radical Alternative* and Revel's *Without Marx or Jesus: The New American Revolution Has Begun*, as well as Sakharov's 1968 book *Progress, Coexistence and Intellectual Freedom*.

This would make an excellent reading list for any study groups concerned with world survival problems. What distinguishes these books from most of the critical and countercultural literature today is their level of technical systems analysis rather than polemics, their programs of constructive action, and their belief that a more humane global future can still be created by our efforts in the next few years. They all accept the three basic premises of the Club of Rome: that our problems are (i) multiple and interacting, (ii) global, and (iii) urgent, on a time scale measured in years rather than decades. And

they stress, with varying emphases, the same cluster of major problems that must be solved together—the “problematique,” as Ozbekhan has called it—which includes peace keeping, the rich-poor gap, the exhaustion of nonrenewable resources, population growth, and pollution and damage to the ecosystem. (There are no “priorities” in this list. The term becomes meaningless for systems problems. Should the engine have priority over the wheels? Or the steering over the brakes? They must all be worked on in parallel, their interrelation being taken into account, to create a total system that works.)

Actually, it is surprising how similar the conclusions of these books are, since their analyses come from several different countries—the United States, Britain, France, and the Soviet Union—and start from several different disciplines, ranging from physical and engineering analysis and systems-dynamics forecasting to ecology, peace keeping and order building, and cultural and political analysis.

Attempts like these to define the image of a humane and attainable future and to do the systems analysis of the efforts needed to get from here to there are more important than ordinary futuristic “predictions.” They may come to play the same role in the present world transformation that intellectual analysis of the class struggle played in the older type of revolution. Both the capitalist and the communist establishments, of course, tend to view all such attempts as nothing but Doomsday sermons: Read any of the establishment critiques of either the computer-oriented *Limits to Growth* or the humanistic-ecological *Blueprint for Survival*. The New Left and the Third World see these studies in the opposite light, as representing hidden national and class interests that invent rich men's crises to justify their continued computerized and technocratic attempts to maintain their domination. This was the theme of the demonstrations in Stockholm against the World Conference on the Environment.

But the fact is that our old establishment programs and our old revolutionary arguments are both being rapidly overtaken by the spreading planetary

networks of television, tourism, technology, and trade. A new scale of problems demands a new scale of formulation. The only answer to an integrated global analysis is a better integrated global analysis. It is true that these present systems analyses of the problematique are only at square one. But anyone who wants to understand or shape the future more effectively—whether capitalist or communist, establishment or counterculture, rich or poor—must take account of these analyses, and apply them or extend them or else prove that he can supersede them.

Richard A. Falk is a well-known professor of international law at Princeton and a director of World Order Models Projects of the World Law Fund. His book, *This Endangered Planet*, emphasizes the ecological interdependence of mankind and the need for designing a new peace-keeping and world-order system to manage our “dimensions of planetary danger.” The sovereignty of nation-states is already beginning to yield to the global network. Major decisions affecting American life are no longer made in Washington or New York. The energy resources of the United States are determined in the Persian Gulf; the prosperity of midwest wheat farmers depends on Russian purchases; that of Detroit depends on Japanese competition; the export-import balance and the value of the dollar are determined in Paris and Geneva; and the profits of the arms industry are determined by sales to 50 countries, competing with purchases of civilian goods.

Yet there is no adequate transnational system for handling our ecological and global threats that also cross all boundaries. Falk says they are too urgent for separate national agreements and gradualist solutions and can be solved in time only if we make “an abrupt . . . and drastic modification of the world-order system” (p. 264; emphasis his). The present Vietnam peace and the détente among the great powers are welcome events, but they are helpful together only by personal contact among leaders who may die or be deposed. The basic instability and the danger of nuclear accident and escalation will remain unchanged until v

create accepted supranational authorities for peace keeping, the settlement of disputes, and nuclear management and arms control.

Falk spends over one-third of his book on detailed steps in the design of a new world-order system and on the activism, political pressure, and personal commitment needed to create it. He shows how in the 1970's, 1980's, and 1990's we will move either from despair to desperation to catastrophe or, with more constructive efforts, from awareness to mobilization to world transformation.

Warren Wagar's *Building the City of Man* (not to be confused with his earlier book *The City of Man*) is another "world-order book" sponsored by the World Law Fund. Wagar is explicit about the need for a global political movement, "the World Party . . . that must create a civilization" (p. 57). He says that the present peace movement fails because its aims are "too narrowly political," while the scientists' technological fixes are "not political enough" and the proposals of the New Left are "romantic, nationalist red herrings" (pp. 40, 42, 45). He calls for a new master strategy with "three main fronts: developing a new ideology of world order and a new humanistic religion, building a world political party to guide the transfer of public power from the nation-states to the world republic, and providing survival insurance for civilization against the risk of Doomsday" (p. 50). (A complete strategy will also need to include the deliberate design of transformation paths and the development of new social inventions for catalytic change on each of these fronts.)

Wagar tries to spell out what the new world could bring, in culture, in the morality of mutual service, in education, in relations between men and women, and in "commonwealth" or political structure. "The world state, as I foresee it, will be unitary, democratic, socialist, and liberal" (p. 142). Some of his ideas may be more radical than necessary, but his main thesis is correct, that we must have an image of mankind's future and that we must begin now to create the change mechanisms and institutions that will bring it into being. He particularly emphasizes the need for fitting together the internalized culture of mankind with the external commonwealth. We will obviously need complementary changes at a hierarchy of levels. Some of the powers of the nation-states must indeed be transferred up to the global commonwealth—

nuclear control, energy, resources, pollution, population, communications—but others need to be transferred downward as far as possible for diverse regional and community and individual self-determination.

*Blueprint for Survival* is the publication in book form of the famous and controversial manifesto which was endorsed by 33 British scientists and which constituted the January 1972 issue of the *Ecologist*. It was hotly debated in *Nature*, the *New Scientist*, the *Times*, the *Observer*, and elsewhere, and extensive counterattacks by such critics as John Maddox, the editor of *Nature*, have now been published. *Blueprint* translates the M.I.T. *Global Environment* statistics and the warnings of *The Limits to Growth* into a program for social and political reorganization. It is perhaps best summarized in the resolution adopted by the Board of Directors of the Sierra Club in May 1972:

The Sierra Club supports the goals as described in the *Blueprint for Survival* of a stable but diverse society for the world community which minimizes environmental destruction, reduces the discrepancy between economic values and costs and social values and costs, and increases the diversity of physical and social environments.

*Blueprint* is actually trying to set up a "Movement for Survival," with "national movements to act at national levels, and if need be to assume political status and contest elections" (p. vi). It stresses the need for "orchestration" or concerted action on many fronts by many groups (pp. 61–65). But its technical emphasis is ecological, on the design of a cybernetic and self-regulatory society (p. 111), with diverse, humanized, and resource-conserving towns and farms, a society which "would provide us with satisfactions more than compensating for" those of our present exponential-growth societies (p. 157). It is a powerful statement of what life could be and what we need to do, and millions of people may be moved by it.

Lester Brown of the Overseas Development Council is a world food expert and author of the earlier, very optimistic *Seeds of Change*. His new book, *World without Borders*, gets into the social and human aspects of the problematique—the rich-poor gap, unemployment everywhere, the rural-urban migration, and hunger. To solve such problems, he urges the creation of a global economy—including and going beyond the multinational corpora-

tion—and a global infrastructure, of communications-education, transportation, and new oceanic, environmental, disaster-relief, and research agencies.

Brown proposes less long-range and fundamental reforms than the previous authors, but he is more attuned to the next steps that need to be taken by present institutions, governments, and United Nations agencies. He wants to turn swords into plowshares, to redistribute resources, to strengthen the United Nations, to formulate a new ethic (p. 361), and to take more American initiative in creating a unified global society (p. 358). Unfortunately he often relies too much on good will, on rather unlikely changes of national policy, and on a United Nations whose structure is obviously inherently defective for solving these global problems. He applauds the recent consumer and ecology and restructuring movements in the United States, but he does not see the need to integrate these into an organized movement for a new world order. He concludes, "The most urgent item on our agenda . . . is the creation of a world without borders, one which recognizes the common destiny of all mankind" (p. 364). A major subgoal, yes; but it conveys little sense of the total system building, from the roots, that is in fact necessary. Yet many of Brown's proposals may be feasible, and it would be important to try to get them adopted in the next few years.

Dennis Gabor won the 1971 Nobel Prize for the invention of holography, and his book *The Mature Society* is a continuation of themes from his 1964 book, *Inventing the Future*. It starts off with his opinions and futuristic proposals on various subjects, such as absenteeism, drugs, inflation, competition, education, "ethical quotients," and "the moral achievements of science." He is against "technology autonomous," but a sort of technocratic smugness often mars his off-the-cuff ideas. He dismisses nuclear war between the United States and Russia as having "probability nil" (p. 19). And he foresees unlimited power: "In the long run . . . uranium can be extracted from the seas . . . with abundant power all metals can be extracted, even from the poorest deposits, or from the sea" (p. 29). No mention of energy or entropy costs or thermal pollution.

Nevertheless his book must be included on the survival list, because he goes on to emphasize that "growth will have to reach a turning-point and we must work . . . towards a stable ecosys-

tem" (p. 24). He sees this as requiring the urgent development of a Mature Society: "a peaceful world on a high level of material civilization, which has given up growth in numbers and in material consumption but not growth in the quality of life, and one which is compatible with the nature of *homo sapiens* . . ." (p. 3). And he says, as we must all say, "Let us avoid the greatest of dangers, while leaving as much freedom as possible for those who come after us . . ." (p. 7).

The fact that these different authors with many different points of view are all converging so suddenly on such a shared image of the global future, with such a shared sense of urgency and needed effort, is astonishing and heartening. It suggests that 1973 may be the

year when a world survival movement actually develops. If these books, and the groups they represent, could generate a real movement of this kind, it could create a focus of hope, a sense of community, and a mobilization of personal and political resources for the long haul on a scale that would in fact transform these global problems. It would be not merely a human organizational event, but a scientific and biological event that could change the slopes of all those Doomsday curves. It could create the possibility of a human future that would be, for the first time, believable.

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THE ASSOCIATION BETWEEN ENERGY AND ENVIRONMENT

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General

Until comparatively recently the prevailing value systems associated with changing technology, especially in industrialized societies, have assigned an overriding priority to the first order effects of technology - in particular to enhance industrial production. The side-effects, such as the degradation of environmental quality, have been virtually ignored. However, during the past few years, there has been an apparent shift in societal values from an automatic acceptance of new technology towards a deepening concern for its environmental and related social consequences. The evolution of energy technology is of particular significance in this regard. We note, for example, that the demand for energy in organism, man and society is predicated on both growth and maintenance - growth is, of course, ubiquitous and so is maintenance, which in its broadest context, is an increasingly complex process. The problem of ensuring adequate supplies of energy in usable form without giving rise to an unacceptable degree of environmental degradation is clearly of profound significance, not least because of the implications for the survival of our species.

The close association between energy and environmental quality has been recognized for many years but there has been increasing interest recently. For example, a portion of Recommendation 59 of the United Nations Conference on the Environment (Stockholm 1972) reads as follows:

*".....a comprehensive study be promptly undertaken with the aim of submitting a first report, at the latest in 1975, on available energy sources, new technology, and consumption trends, in order to assist in providing a basis for the most effective development of the world's energy resources, with due regard to the environmental effects of energy production and use ....."*

The objects of this paper are threefold - first, to review the categories of available energy and the associated environmental concerns, secondly, to consider the central question of how to conserve energy particularly by increasing the efficiency of energy conversion and utilization, and thirdly to comment on some of the educational implications. In the industrialized nations the present exponential growth in the consumption of energy is giving rise to concern, and indeed stress, not least because of the associated escalating difficulties of maintaining environmental quality. There are two basic aspects of the energy growth problem which are relevant:

- (a) the gross growth associated with population growth, and
- (b) the per capita growth.

The best hope for conserving energy probably rests in the reduction of per capita growth (e.g. by reducing the domestic consumption of electricity and by introducing pricing strategies aimed at minimizing energy waste). Undoubtedly the time is ripe for governments to provide real incentives against the wasteful consumption of energy and for the development of processes predicated on non-wasteful consumption. Paradoxically, however, while some steps can be taken to improve environmental quality by reducing energy consumption (e.g. the expanded utilization of public transportation to reduce the use of private automobiles), other steps will inevitably require additional expenditures of energy (e.g. the recycling of solid wastes, the minimization of toxic automobile emissions, the desulphurization of fossil fuels, etc.).

## Energy Resources

It is a truism that energy is essential for the stimulation of economic growth (whether or not this in itself is a desirable goal is beyond my competence to assess!) and in consequence there is close correlation between energy consumption and "standard of living". It is interesting, for instance, to speculate on man's demand for energy as civilization has evolved. Primitive man, some 200,000 years ago, used approximately 2000 kilocalories per capita per day; after the advent of elemental hunting tools and the discovery of the uses of fire (50-100,000 years ago) his energy requirements probably doubled to about 4000 kilocalories per capita per day; with the harnessing of the power of animals (about 7000 years ago) his consumption reached probably 12,000 kilocalories per day; advanced agricultural man 500 years ago, having harnessed the energy of falling water and wind, and with the use of coal for heating purposes, was probably using 26,000 kilocalories per day; the development of steam engines and associated machinery brought the level of consumption up to about 70,000 kilocalories at the beginning of the 19th century; in 1970, in North America, it was estimated that with the development of centralized power stations, internal combustion engines, etc. the energy consumption had rocketed to about 230,000 kilocalories per capita per day - an overall increase of primitive man's requirements of no less than 115 times. But it is noteworthy that in the less developed countries such as India the energy consumption per capita is only about 5% of that in North America.

We distinguish between non-renewable and renewable sources of energy. In the case of the former (i.e. the fossil and nuclear fuels) the stored energy when once released, e.g. by burning, is irretrievably lost and usually only a comparatively small percentage (not greater than 40% at present) can be used for useful work. On the other hand, the renewable

resources have virtually unlimited time-scale.

In effect the fossil fuels, from which energy is obtained by oxidation, store the solar energy which was initially produced by nuclear reactions in the sun's interior. With the expected increases, over at least the next decade or two, in the rates of consumption of natural gas and crude oil the world's natural reserves of these resources may be severely depleted within 50 years. On the other hand, the reserves of coal, shale oil and the tar-sands are very substantial and, assuming full economic development were to be feasible, there would probably be adequate supplies for at least one or two hundred years.\* But this assumes that the complex environmental protection issues associated with the discovery, drilling and transportation of gas and oil from, for instance, the arctic regions have been adequately resolved.

In the case of the nuclear fuels (i.e. uranium and thorium) the world's supplies, assuming the successful development of the so-called "breeder" nuclear reactors, which is still somewhat problematical, may be adequate for 100 years. However, if these electrical energy generating systems prove to be non-viable the reserves of uranium and thorium, at acceptable costs, may well be depleted within the next 60 years. In the industrialized countries the replacement of a "mined energy economy", by the year 2050 A.D., by, for example, an economy based on essentially renewable energy resources such as solar energy and nuclear fusion energy will be virtually mandatory.

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\* The time-scale would depend, of course, on energy developments in controlled nuclear fusion, solar energy, etc. during the ensuing period.



## Energy for the Developing Countries

The development of agriculture, in order to optimize land-use, in the developing countries has obviously been inhibited by the lack of energy in usable form. This also applies to the slow development of industry in so many of these countries. With the exceptions of certain Middle Eastern nations and countries in South America the majority of the developing nations are not "energy-rich" countries in consequence energy must be imported. The question arises how most effectively energy in "usable form" (e.g. electrical energy) can be produced in these countries.

Clearly, to follow the patterns extant in the industrially developed countries would be most undesirable not least from the points of view of efficiency of energy conversion, transportation of energy, environmental implications of energy production (see the next section), and the fulfilment of the real needs of the peoples (for instance, health needs must obviously be given high priority). The development of large-scale energy distribution networks centred on ultra-high-power central electricity generating stations does not appear to be a viable approach. Nor does the too rapid development of transportation systems and highways predicated essentially on the wasteful burning of petroleum. (On the other hand the development of modern mass transit systems utilizing electrical energy may prove to be an effective approach.)

In many respects, not least the optimum utilization of energy, the developing nations may well "leap-frog" developments in the industrialized nations. The key would appear to be the widespread use of electrical energy generated firstly by nuclear stations (based on the fission of uranium), the development of efficient electrical generating stations which combine gas and steam turbines for the production of

"clean" electric power from fossil fuels - these stations would probably have capacities in the order of 50-100 megawatts. Such systems would probably be fuelled eventually by derivatives of coal. Another possibility is the use of the principles of magmeto-hydro-dynamics (M.H.D.) through which the direct conversion from energy generated in "jet engines" into electrical energy will be possible - indeed it is possible on a comparatively small scale at present. Both the gas-steam-turbine approach and the M.H.D. approach lend themselves to the decentralization of electrical energy generation and both are comparatively "environmentally clean".

We can visualize an essentially electrical-energy agricultural and industrial economy in which fossil fuels (albeit limited), nuclear fuels and solar energy play the central role as the primary sources. Admittedly, at present, the associated technologies are by no means fully developed and the corresponding unit costs of electricity might be high. But great efforts are in hand to reduce the costs not least because of the environmental quality considerations and the fact that these methods will utilize fossil fuels and/or nuclear fuels far more effectively than at present.

#### Environmental Concerns

All stages of the development and utilization of energy have an essentially deleterious effect on the environment. Until comparatively recently any conflict between increased energy production, or indeed any other type of production, and the necessity of maintaining environmental quality was almost invariably resolved in favour of higher production. But recently there has been a shift in societal values and norms away from the automatic acceptance of economic growth for its own sake towards a fuller appreciation of the associated environmental and social consequences. In particular, during the past few years, concern about the

protection of environmental quality has grown significantly especially in terms of public awareness. But implementation of associated policies remains minimal. In the industrialized nations, for example, there are two conflicting desires - on one hand abundant energy and environmental quality, and on the other, abundant energy and low cost. Nor will man in these nations voluntarily decrease his use of energy and clearly pricing strategies which reflect fully internalized social costs will soon be essential.

In reviewing the environmental impact of generating usable energy I will restrict the discussion to energy production based on the burning of fossil and nuclear fuels. It is recognized, of course, that the environmental damages arising from the construction of hydro-electric dams are many and may have far-reaching effects, but hydro-electric systems will contribute only a comparatively small percentage of the world's electrical energy in the future.

Natural gas is probably the best form of energy available at present from an environmental viewpoint. The reason is that, at present, sulphur can be readily removed and can be sold commercially, similarly such hydrocarbons as ethane, propane and butane can be removed from natural gas and processed for commercial and domestic use. In consequence, the use of natural gas as a primary energy source has multiplied during recent years and there is concern that, unless massive new reserves are developed, the supply of the fuel will be exhausted within 50 to 60 years.

At present the second best form of energy from an environmental point of view, is crude oil. However, the future supply of this fuel is in little better shape than that of natural gas (the use of vast amounts of petroleum by automobiles etc, plus the widespread use of oil in industry are the central concerns). The major environmental threats are

associated with the phenomenal increase in off-shore crude oil exploration programs and the concomitant increased probability of accidental oil spills. In addition the threat of the shipwreck of massive oil tankers (some as large as 450,000 gross tons), leakage from oil pipelines especially in arctic regions, and the liquid and solid wastes produced in the extraction and processing phases.

Coal, which is relatively abundant on a global basis, varies widely in so far as potential pollution hazards are concerned. For example, some coals are comparatively sulphur free while others have high sulphur content - coal containing about 3% sulphur is regarded as average. To put the air pollution problem into perspective we note that a modern 1000 MW electric power plant, burning 9000 tons of coal per day, will produce on the average, 30,000 tons of carbon dioxide, 600 tons of sulphur dioxide and 80 tons of nitrogen dioxide and discharge them into the atmosphere every day. Furthermore, the deleterious environmental effects of the extraction of coal (especially using strip mining), upgrading and transportation are well known.

In the case of nuclear fuels the mining operation produces large quantities of solid wastes. The radium content in the "tailing dumps" must be monitored in perpetuity because of the associated health hazards. However, the routine discharge of low-level radioactivity from nuclear power plants are presently minute compared with the level of the natural background of radioactivity - rigid standards have been established by international scientific bodies. There remains the problem, nevertheless, which may be exacerbated manyfold during the next few decades, of the adequate disposal of the highly dangerous radioactive wastes which are contained in the spent nuclear fuel - the half-life of some of these products may be 20 years or more and the task of handling and transporting them to suitable storage locations obviously

constitutes environmental hazards of a high order.

All energy conversion processes give rise to waste heat because the thermodynamic efficiency of these processes is always less than 100% and may in the case of electric generating plants be as low as 30%. The heat normally lost through cooling water or to the atmosphere is sometimes referred to as "thermal pollution". Especially in countries like the United States with a high level of electrical energy consumption the thermal pollution problem may assume a critical magnitude by the end of the century because the potentially large increase in the temperature of the water of rivers used for cooling (increases of as much as 10-15°C have been predicted). The associated ecological problems, especially those relating to the maintenance of aquatic life in the rivers, must be a cause for concern. On the other hand research is being undertaken to utilize the thermal waste from power stations in a beneficial way - a case in point is to use the waste heat for large-scale sewage treatment plants and for aquaculture.

A final environmental concern relates to the distribution of energy. This will necessitate increasingly complex distribution networks which will have a variety of environmental impacts not least of which will be the aesthetic impact.

### Educational Aspects

The high probability of the continued burgeoning of the demand for energy on a global basis, especially nuclear energy, suggests that institutions of higher education should increasingly develop programs of study in this field. The environmental aspects of energy production and utilization are, as already stressed, central, and this immediately implies that the programs mentioned above should be essentially multi-

disciplinary. The major disciplines involved are economics, engineering, the policy sciences, the behavioural sciences, geography, biology (with special reference to ecology), law (because of the urgent need for adequate regulatory machinery to ensure environmental quality), and sociology.

At undergraduate levels the programs in energy-environment studies can be classified as "thematic" and might consist of packages of four to six semester-courses. At graduate levels the courses would be appreciably more comprehensive and would be associated with active research projects in the field.

Political science and economics would be essential components of all programs because of the increasing urgency of ensuring that the general public has an adequate voice in decisions relating to the production and utilization of energy. At a time when conservation must be regarded as an urgent requirement, all sectors of the formal educational "establishment" should inform students and the public of the inherent dangers of the continuing exponential growth of the demand for energy (this, of course, applies exclusively to the highly industrialized countries).

The educational implications of the energy problem which relate to developing countries constitutes a major challenge. Clearly, in the majority of these countries the level of energy consumption will not approach current levels in, for example, North America for several decades (if ever!). The economies of these countries are essentially "labour-intensive" (and this may be important for the species as a whole because of the negative physiological and psychological implications of high levels of energy availability) and as the supply of energy per capita increases emphasis must be on "creative engineering" and "creative economics". I hesitate to comment on the educational implications except to stress that

the associated problems should be studied on an urgent basis. While the energy and environmental problems confronting the industrialized nations appear to be far more severe, because of man's wilful consumption rather than efficient consumption of energy, the problems associated with the rapid growth of energy utilization in developing countries are equally intransigent.

Neither the law nor the "market place" will adequately handle the complex regulatory processes needed to reconcile energy policies with environmental quality. I suggest that the only institution with the potential to speed up the adaptive process in order to cope with such highly dynamic situations is the university.

#### Summary of Issues

The issues summarized below are by no means exhaustive nor is the order in which they appear of any particular significance. Some of the issues have been treated in a little detail in preceding sections while others have only been mentioned transiently - hopefully the summary which follows will provide a basis for discussion of the energy-environment problem:

- (a) The central issue is clearly - how can energy policies be reconciled with environmental objectives?

This question has ecological, economic, technological, and sociological overtones. Furthermore what appear to be reasonable alternatives for the highly industrialized countries may be completely unacceptable for the developing countries.

- (b) Bearing in mind the environmental protection implications, to what extent should a policy of conservation of non-renewable resources be pursued?
- (c) How can the establishment and enforcement of environmental standards, with special reference to the problems of energy transportation, production and

distribution be expedited?

- (d) How can the urgent energy requirements of the developing countries best be fulfilled without undue environmental degradation?
- (e) How can energy conservation practices best be implemented? Possible approaches are the use of more effective thermal insulation of homes, offices, etc.; by conscious efforts to minimize the promotion of energy consumption; by realistic pricing policies, etc. Suffice it to add that far more attention must be paid to "leaks in the energy system" - for example, such leaks as the escape of hydrocarbons in the form of unburned fuels, the use of excessively active fertilizers, the waste of chemicals, inefficient home and building designs which create unnecessary demands for heat, light and air conditioning, and lastly, but by no means least, the utilization of the thermal discharges of electrical generating stations.
- (f) How can a better informed public be developed and how can its input to major decisions be facilitated? - note particularly the role of educational institutions and of the media.



*CONFERENCE PROCEDURE*

**GROUP 6**

The participation of all people toward their self-realisation through communication: the present state, potential advantages and disadvantages of the 'holistic' approach in the study of systems and the development of communications facilities.



## THE FUTURE OF THE "ANIMAL SYMBOLICUM"

By Silvio Ceccato  
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I would not hesitate to judge man as the most fabricated of all living beings on earth; and I would add, fabricated because of words. In fact, it is to linguistic communication that we owe the fact that the private world of everyone -- in thought and its contents -- the world in other words that each builds for himself, becomes public and thus meets and mingles with that of every other. It is in this way that the child in its early years, learning to speak, receives as a gift an inheritance of the collective operations of tens or even hundred of thousands of years: so that today one can almost reverse the genetic relationship between thought and language, between mental life and language. Thought and its contents -- perceptive, representative, categorical, etc. -- preceded in the phylogenesis, and virtually also in the ontogenesis, language; and still in rare cases the just constructed thing-to-be-named is in search of a name (but it is always a case of babblings). Nevertheless, with the baby, immersed in linguistic surroundings for thousands of years, the opposite occurs. It is words which lead him to understanding and to representing the things in a certain manner, even to connecting them in a certain way; in other words to operate along firmly pre-established lines with his mechanisms of attention, memory, correlation, etc. The fusion is such, moreover, that Plato had no hesitation in viewing thought as an interior language.

The building up of a language such as we possess today, with its two inheritances of named things, symbolizata, and of names, symbols, must have required hundreds of thousands of years, so that the transitions, in both senses, must be seen as a spiral which prevents us from making a clear cut between the man loquax and the man pre-loquax, the animal symbolicum and the animal pre-symbolicum. In any case it is clear which stage in the story of man is marked by the coming of

language, and how was this linguistic event which marked other fundamental stages. First and foremost, that of the written word which gained for the spoken word its endurance and range, and marks the transition from the pre-historic to the historic; that of the press which ensured the rapid, correct and economic multiplication of the word and marks the transition from ancient to modern history; up to the last stage, when it became possible to entrust the physical modifications used in support of signs to the electromagnetic waves, and it became possible to record them acoustically, the voice still retaining its intonations, and to record optically with three-dimensional reconstruction, in holograms.

In this way, communication becomes instantaneous, ubiquitous, less costly, almost free. It does not have to be sought, it enters the house. The idea of frontier territories becomes weaker, also those of the building, the room, the very walls.

What does all this signify for man's past and present? How can one adjust oneself in the future? If the answer escapes us it is because of the difficulty of imagining a man today outside that omnipresent network of signs. It may also be said that, if he is loquax because he is sapiens, by now he is sapiens because he is loquax; and it would be easier to envisage a world that survives the destruction of humanity rather than the survival of humanity deprived of language. Man and the sign-man are thus fused. So it is through this sign-man that individual and social aspects are fused. One recalls the saying of the wise man of the East: "When I speak, it is you who become my thought".

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The innovation ought to concern the sign-fact but to regard a qualitative more than a quantitative characteristic. Even the mere increase of the circulation of the signs naturally has its importance; it has already been noted how man responds to it, conserving within certain limits his own sign-equilibrium. It is known, in fact, that the little is adopted much and the much is adopted little. What arrives

in such abundance appears inflated; he who receives it appears saturated. The radio and television can stay on, but the adult, above all, is both receiver and non-receiver. Books, magazines and newspapers may cover the table but they are often scanned through for the headlines, etc., and<sup>no</sup> one knows what is retained. One also knows how after a certain age little is retained from reading or discussion. Not even the circle of acquaintances or friends enlarges much with the spread of the informative network: the usual hundred persons.

Three qualitative aspects, due to the three developments in the science and technique of linguistics, could, on the contrary, have considerable bearing on the future of the animal symbolicum. Here they are in the order in which we shall take them: the new awareness of the operational origin of named things; a universal language based on the planned arranging of things to be named; a non-linguistic way of communication.

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Twenty five thousand years ago when men -- at least as far as we know -- began to interest themselves no longer only in the relationships between physical things but also in where perception came from, in how sign-relationship was formed, etc., they fell into understandable and perhaps inevitable but noxious error. It is believed, namely, that what results from our constitutive operations, in perception, categorization, thought, etc., already exists per se, independently of human intervention. The error is plausible for various reasons. First of all, anyone who deals with physical things and their relationships must have already carried out the operations through which he had already perceived them and thus the act of perceiving is passed over by the instrumental use of things perceived. They are there; that's all. Besides, they are operations that have already been carried out for hundreds of thousands of years, transmitted and handed down through language. Finally, the organs of which these operations are functions are not plainly visible, neither is their execution accompanied with effort.

The consequences of the error are innumerable. For instance,

attention is distracted from the constitutive operations to the impossible operations which would transfer to the inside of the head what already existed outside it. In that way, the perceived things become unduly doubled and there arise the unsurpassable difficulties of describing the transport operations, of explaining the doubling, and of making a comparative test between what is incognito outside the head and what is cognito inside. The verb "to know" used to indicate adaequatio of the internal with the external things implies an irreducible metaphor. In current terminology, in fact, it means the possibility of doing something since it has already been done, a relationship therefore between two things that are both present. Everything then "being known" should pre-exist, and to find its own place in the head ought to be stripped of physicality, since otherwise there would be no room for it. One will speak therefore of things doubled, but not actually as such, rather in the form of an "image", "concept", "abstract", as opposed to the "concrete": all words used also according to an irreducible metaphor.

The same thing happens to attitudes and values. It is believed, in other words, that what is the fruit of attitudes and criteria of values exists per se as it is; that for example, any of our activities is in itself work, play, aesthetic, ethical, political, scientific, philosophic, etc., and thus pleasant or unpleasant, good or bad, just or unjust, true or false, real or apparent, objective or subjective, etc. This results, in any case, from the operations of the one who applies these terms, but the operations disappear and the statement, since it is an indication of what would exist per se, assumes extra-historic, extrapersonal force. Thus, this assertion becomes universal and necessary because it is presented as bearer of the values of truth, reality, objectivity, a mirror of that very "reality of facts which surrounds us"! In this way, however, man, not only in respect to others but also to himself, fixes on something which transcends him even if he doesn't manage to hypostatize it in the work of a divinity. Consider, for instance, how the rational and irrational arise and how they are transformed owing to the error of the doubling of the perceptum. The rational is what makes us achieve the aim

sought: for example, throwing oneself from the seventh floor is rational if one wants to commit suicide, irrational for living long. No action, that is to say, is rational or irrational, but all become one or the other once the aim is established and thus according to it. He who maintains that the rational and irrational can be seen by opening the eyes only, does not hesitate to speak of a Reason, which would be equal for all and would result from the whole of those, actions. Then he will say, convinced of referring to certain ways of behaviour and those only: "Reason will always have reason", "Be reasonable", "One must protect and not corrupt Reason", and so on. Let's take the case of just and unjust. Apart from the attitude, which must be constituted so that one can see if something corresponds or not to what has been commanded or ordered, that is to say, according to an imperative, a norm (and it must be an imperative obtained in a certain way), there then comes into play the particularity of the imperative, which in the case of the just can be, for example, a "being equal for all", "bearing in mind the needs", "taking the merits into account", "taking into account the work", "respecting the law", "respecting the privileges", "respecting strength or weakness (like the interests of the strongest and the weakest in Plato's suggestions), etc. Here again, a universal and necessary just, seeing by opening the eyes only, becomes Justice, a goodness, Themis, a just and awe-inspiring God.

If the error of doubling the perceptum is removed, if man becomes aware of the operation which constitutes the things he names, with no exception, whether as single contents of thought or in its correlating combinations, this transcendence disappears. Man thus finds himself alone in his suggestions to the others and in those he receives from others. At first he will try to evade responsibility, taking refuge in ideology, if he is not religious, seeking counsel in science and technology which instead open up alternatives for him but do not present him with the criterion to select, thus increasing to exclaim, as he grasped the crown: "God has given it to me. Woe to anyone who touches it"; but today this god would not be written with a capital letter. This man, at the mercy of himself, aware of being the one who fabricates the most and the most fabricated

of living beings, aware of what he exchanges with words -- almost everything -- is in the near future of the animal symbolicum.

If he does not want to be expelled from the cross section of discordant voices in attitudes and values which assault him on all sides, because of information having being entrusted to electromagnetic waves, he will have to build himself up mentally, transforming his operational awareness not into weakness but into strength. Certainly, a dictatorship could prohibit semantic research, but I hope it can become a basic subject at all school levels.

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Will a universal language cease being a dream, or Utopia, and become a feasible project?

In the meantime, one sees why the various attempts have failed. With the exception perhaps of Leibniz's proposal and those of a very few others, attempts were made to take as a start existing languages, the inherited named things and names in these languages. Thus the change was limited to<sup>a</sup> choice of acoustic and graphic material used in the words; namely, a new sound in the place of "dog", "chien", "cane", "Hund", etc., a sound that could in some way recall the substituted word. Also the relationships put by our mind between the things remains the same, that is to say, certain conjunctions, prepositions, suffixes of the languages taken as a model. From this was obtained a parasitic language, certainly simplified and more regular compared to the languages built up through history but with no advantage as an heuristic instrument or upholder of thought, nor as a means of communication as long as it remained less widespread than the natural languages: little chance of success, given the hundreds of millions of people who speak some of those languages and the enormous amount of literature accumulated by each one.

However, certain linguistic sectors have pushed out others and become universal: series of numbers, chemical elements and the way music is written. Today, they have a common characteristic which makes them not only a means of communication but, as it happens, a heuristic instrument and an upholder of thought. The names, in fact, have been



introduced and bear an indication of a precise order imposed on the things to be named, serial arrangement obtained by use of a module which develops the series according to a growing complexity.

Would it be possible to proceed in the same way for all the thought contents and the thoughts themselves?

The affirmative answer comes from an analysis in terms of operations on things to be named, conducted over the last decade, in view of the building of linguistic machines: the machine which translates, the machine which observes and describes, etc. All the things we name have proved themselves to be made up of operations deriving from the few fundamental mind mechanisms; to be precise, attention, memory, correlation. They are either isolated, elementary operations or combinations of these, combinations, in fact, that can be aligned in a series according to a development of increasing complexity. For instance, the beginning of the mental category series, composed homogeneously of states of attention (S), can be seen (fig. 1).

The exhaustive formation of the series demonstrates how only some of the possible combinations have been used up to now (as happened, in chemistry, after the introduction of Mendeleev's tables, and, in music, after the way of writing; nor was a "last number" ever to be thought of). Here then are some suggestions for those combinations not yet in use. The upholder of thought derives from the order in which all the things named are placed, and this can be reflected in their designations.

The new language will offer many other advantages. For example, from the very form of the designation, distinction can be drawn between the things of observational origin, those constituted from relationships, those containing values, those connected with the peculiarities of the speaker, and those where the speaker has abdicated in favour of some apparatus, etc.

Furthermore, the new language will be projected so that it can lend itself both to mechanical dictation, and mechanical translation into the natural languages.

The animal symbolicum with this language at his command will be able to participate in a linguistic society of billions of persons; but he will above all acquire a hitherto unknown mental dimension

and through this an augmented social responsibility. The domination of the things named through their operational constitution will make it impossible for the originality of the individuals to provoke changes that would endanger the univocality of the semantic engagement. Originality will express itself, however, in a combinational direction, that is to say, in thought-speech.

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The third coming for the animal symbolicum is without doubt highly dramatic, since it cuts into the nature of the symbolic and loquacious being. This coming has a more futuristic character, although it represents a well-contained development of the operational premises referred to above.

The possibility of breaking down the things named into minute operations, whether they be single contents of thought or its correlational structures, and of describing these operations in proper terms (that is, not metaphoric) and positive (that is, not negative) permits, once they become considered as functions of the organs, a coming back to the individualization and description of these organs and the way they function.

Now, these organs are physical and physically is the way they function, and it is not excluded that the changes which take place in them are not accompanied with other physical changes somewhere else. In this other place it will be possible "to pick up" the single contents of thought and its correlational structures: a thought made public independently of any linguistic expression.

This is also presumably the way the phenomena of telepathy come about; but if now in these phenomena the way is so uncertain and rare, it would eventually become a reliable means, much more so than certain connections with other physical phenomena, such as blushing, trembling, perspiring, drying up, etc., connections that vary somewhat from one individual to another because of the different constitutions of the speakers, because of the different habits of control in expressing one's own thought and sentiment feelings (one reasons, for example

of the low reliability of the truth machine).

The drama of the situation is thus clear if we consider that up to now man has made use of linguistic expression in three ways: to be sincere, to be untruthful, or to keep silent. The proportions might be divided equally into three parts. A psychologist, ~~a propos~~ of this, has noted how a baby first enters into social life, emerging from a state of uncivilized egotism to become a human being, at the moment he realizes that he can and must lie or be silent.

Our coexistence, our social relationships, and, above all, our political and religious morals, etc., are securely based and dependent on this linguistic situation.

What will happen when we are open to this compulsory sincerity? Shall we defend ourselves behind a mask or shall we accept it and transform it into a force of social cohesion, into an organization that perhaps recalls that of termites or bees? It is certainly difficult to imagine that our common life could continue as it has <sup>up</sup> until now, or that a political leader could guide it in the same way. It was not for nothing that a similar theory put forward by Nicola Marr annoyed Joseph Stalin so much. It is possible, however, to expect either a freer man or a man less free, a man strengthened by the courage of his own thought or a man weakened by the fear of his own thoughts.

I have here presented the first possible attentional constructions. As can be seen, not all of them have found employment and received a name, and larger blank spaces are found as we continue the series. The series, although in theory it can be continued indefinitely, in practice (and this is easily understandable if we keep in mind our biological limits) ends when the combinations reach a certain degree of complexity. Man, today, presumably after some hundred of thousands of years, has prepared himself a thousand or so mental categories, of which, as we shall see, about two hundred are used as correlators in thought.

As to the functioning of the other organs which the attention makes present and breaks into fragments, a list of these elements as well

would be indispensable in order to see with what stones the building of the mind has been constructed. These are in fact at the same level. In this regard I hold that we can be neither completely pessimistic nor completely optimistic. This list already exists more or less, even if it is rather imprecise and oscillating, when one gathers together, in dictionaries for examples, the names both of colors, flavors, odors, etc., that is, of so-called sensory data, and those of the types of lines and surfaces into which various figures can be broken down, and which correspond to our movements. But this is certainly not a matter of values which can be considered as minimal, nor would it be useful for man to have individualized and named all of them for his daily uses. In order to ensure that the picture be complete, another path has been chosen, that of seeking to pair up these elements with physical situations according to the stimulus-response relationship, introducing units of measure into the study of physical situations of stimulus, and therefore introducing the order of the numeric series; whereas forms are treated by analytic geometry.

However, I think that a study of the thresholds whether absolute or differential in order to obtain an all-embracing picture of these elements of these building blocks of the mental edifice, given our biological limitations, is not at all to be excluded. It can happen, of course, that the individual only uses a part of them.

What I now propose to show is the hook-up between the results of attention - whether applied to itself or to the functioning of other organs the physical and psychical world. This time the hook-up is no longer obtained through the stimulus-response relationship, that is, the physical evocation of mental or psychical responses, but through the relationship, fundamental for our purpose, of <sup>the</sup> constitution of the psychical and of the physical on the part of the mental, a relationship which, in a certain respect, is inverse to the former.

(Note that here too it is not a matter of an articulation of the physical or psychical things, that is, for instance, the articulation which takes place when water is decomposed into hydrogen and oxygen, or jealously into fear and desire, when the elements and the whole retain the same spatial and temporal characteristics.)

Meanwhile, it will have been noted that the results obtained from the application of the attention to the functioning of the other organs can have, as such, neither moment nor place, in that this would require that they had first been put into spatial or temporal relationship with something.

The attention is directed to the functioning of the other organs, but it is not yet directed to the functioning of the other organs in a way that would require that they had first been put into spatial or temporal relationship with something.

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THE PARTICIPATION OF ALL PEOPLE TOWARDS THEIR  
SELF-REALISATION THROUGH COMMUNICATION.

INTRODUCTION:

by Roland Chaplain  
B.A. in Theology

The holistic approach to the future seeks to express from many levels of awareness that the future actions and ideas of all those now living are inseparable from their impact upon the lives of their descendants stretching through a time span possibly running into millions of years. The life which has taken three thousand million years to evolve on earth is faced now with the prospect of no longer being totally confined to this planet. This being so, man must be prepared to take into consideration the possibility of his future interaction with consciousness existing elsewhere in the universe and perhaps even complexity giving rise to consciousness in forms as yet unimaginable. However, if man does prove to be confined to this solar system, the urgent consideration arises of how much of the earth's surface should be allowed to remain undominated and exploited by him in order that:

- a. Other species can continue to evolve "naturally" so that in the event of man's extinction the possibility of higher levels of consciousness again evolving will not have been diminished.
- b. Sufficient mineral and energy-giving resources will be preserved to enable technological development again to take place if there were only a very small number of survivors from a major nuclear or germ war or other global scale disaster.

Different facets of human development are not keeping pace with one another. Science and technology appear to have left far behind the spiritual, moral and intellectual resources necessary to cope with the power released through applying this new knowledge. In terms of the total length of our own evolution, awareness of the vastness and enormous time scales of the universe is an incredibly recent phenomenon on Earth. A huge range of new problems have arisen, within a very short period of time, and we cannot turn to our knowledge of the past for solutions. Indeed, some would say that to apply those solutions of the past which involve financial and other incentives to encourage activities which entail increasingly rapid use of non-renewable resources to give very transient and dubious pleasures would be to gamble

with the future in a way that could cause future generations to look back on our own as the most irresponsible in history.

Presently, the speed of change means that more factors must be taken into account in less time for ever more frequently required decisions. Existing social, legal, political, trade and economic structures, education, languages, concepts and value systems all appear inadequate to meet need as experienced in today's world, and this is even more true of anticipating needs which may enter man's awareness tomorrow. It is easy to become pessimistic when these and many other inadequacies which we see in human systems are compared with our too simple images of perfection. It is hoped in this paper to begin to indicate some areas of particular interest to myself and to others who have asked me to feed in some of their ideas for consideration, a function which I am only too willing to fulfil in the belief that this is of great importance in the supportive work for any world gathering which aims towards a holistic approach to the future and the participation of peoples of all ages and potentialities in the creation of that future.

Five main areas of concern in this paper are as follows:

1. The socially divisive effects of technical or sociological jargon which cannot be understood, and communication procedures which are unfamiliar to most people.

The link is also indicated between this phenomenon and the problems of secrecy in industry, government departments, the military, research, etc., and the suppression of socially desirable discoveries for reasons of financial interest.

2. Difficulties of keeping up to date with new knowledge and information. This is looked at particularly from the point of view of our needing to know what others are doing and thinking now and what they are planning for the future.

3. Some lessons which might be learned from the experience of making, communicating and applying weather forecasts.

Social, moral, economic, international, legal, ecological and other considerations associated with intentional and inadvertent weather modification are looked at from the point of view <sup>of</sup> decision making in situations where a relatively improbable event would have a very drastic effect if it were to occur.

4. Biological, social, psychological and spiritual constraints upon man. These become evident through ongoing tensions produced by pulls towards: DIVERSITY, EFFICIENCY, SIMPLICITY, PERMANENCE, NOTHINGNESS, INDIVIDUAL IDENTITY, COMMUNITY.
5. The futurising of education to equip all people according to their changing needs for participation in creating the future. Self-realisation may happen in a multitude of ways. Our task at this stage in evolution is to protect and build the infra-structures which will enable this to continue to happen.

Transcending these five broad areas of concern is the desire to look for ways of enabling a situation where no one on this planet need feel excluded from identifying with the process of conscious determination of at least their own and their community's future. To look for more than this within our own lifetime would entail the risk of being accused of lack of realism. We should be cautious when dreams of perfection become more than the motivator for the achievement of the realisable and the stimulant to look to the limits of that which can be comprehended.

#### SECTION 1:

WORDS MUST NOT BE ALLOWED TO HIDE OR OBSCURE INFORMATION.

If every writer were to give all the sources for all the ideas and for all the information contained within his writings . . . . . but we know very well who actually gets quoted!

It's all right! We can go onto the defensive and argue that the reader needs to be able to compare source documents and even to analyse the unique evidence contained therein. Think for a moment! How often do we see the real sources being credited? Are we being conned by one of those promotion seeking academics whose purpose is primarily to impress the reader with his scholarship? The trouble is that scholarship becomes equated with the frequency with which one is quoted, and a mutual praise (or condemnation) network comes into existence. Now, we all know very well that the rich tend to become richer and the unemployed to remain enemployed. The same seems to hold true for success with writing and communication - even for conferencing.



"Beware", my friends say. "You will become a professional conferencer, and then you will become alienated from us. You will learn the language (official language? - Jungk - Bucharest) of your fellow conferences, and then - - - - it won't make any difference how much you talk about participation and self-realisation for all of us!"

Why is <sup>it</sup> that after all these thousands of years we still have not learnt that language <sup>is</sup> developed for communication rather than to isolate its users?

Don't get me wrong - in Section 4 the importance of increasing diversity, even in verbal language, is strongly defended. The question that we should ask ourselves is whether it is right that the languages of the technologist and the academic should develop rapidly whilst local dialects, expressions and culture decline.

"Today I gave a "brilliant" lecture. No one understood me".

Language is a powerful socialising force. (See: "On the Classification and Framing of Educational Knowledge" - Basil Bernstein, 1971 - private circulation - though I expect he has said it equally well in less than 29 pages somewhere else).

This is a serious problem for the future. Information becomes hidden in the sociologist's, economist's, politician's, zoologist's, lawyer's, meteorologist's, etc., technical jargon.

Ordinary unclassified people haven't a hope of participating if they cannot get at the information. Even the classified people are up against the problem when they want to grab a bit of information from another classification, and some of them ~~are~~ are not too happy about the long years of their lives spent in classifying themselves or being classified and then discovering that 40% of their classification is out of date after 5 years. Feed that one into your computer and your population will crash simultaneously from information shock and from not having enough time to eat and sleep because the time will come when so many new words will have to be learned each day. Who has the answer? Clearly not you and I. Perhaps the system has the answer? But, the model merely reflects the selections of its creators.

In case I am giving a misleading impression as to my views about the M.I.T. "Limits to Growth" debate, let me stress that when faced with a really serious threat at the 5%, 1% or even the 0.1% probability level it is worth exercising caution. (See Section 3). A long string of references can be rather daunting.

How does one choose which to investigate? So, let me stress that these few which I do give are well worth reading.

Prof. Arthur Harkins, "Sociological Notes on the Futurising of the Multiversity" 1972 American Sociological Association Seminar on the Sociology of the Future: Page 15 - " - - - - new information technologies and 'adhocratic' organizational structures are beginning to undo the monopolistic hold on much of the world's information formerly enjoyed by colleges and universities - - - - these changes will take place with or without their assistance".

Quoting Polak on page 6 of the same paper Harkins broadens the scope of his concern to include "the new technological elite which is keeping the destiny of our future in its own hands as a sort of monopoly".

How far can the information technologies go towards enabling global informed participation? If we predict that this will be achieved too soon, is there not a danger that those with the power and the information will suppress their development, or perhaps more subtly allow their development but then deceive their users into employing them for other purposes?

One of the greatest scandals in the academic world is the writing of PhD theses, often over 100,000 words in length, and destined to be read by only one or two other people. A valid exercise perhaps, but dangerous because it is in itself a form of conditioning towards non-communication. As a result these people continue to work on the frontiers of knowledge, but they do not feed their findings very effectively into global consciousness. Indeed they can make easy prey for the more ruthless industrialists.

They should take the advice given in Brian St. Quentin Power's paper, "Learning from the Peasant" based on his experience of modern China.

We have a very long way to go before whole communities will become alive to a multi-directional critique of one another's work, research, ideas, life styles, etc., as a way of achieving self-realisation through participation. Just a thought: to write a 'paper' about this does rather kill the message. The use of films and satellite link-ups should be seriously considered. In fact, it has been pointed out to me several times recently by people who are concerned about a holistic approach to communications that people with predominantly artistic, dramatic, musical, inventive, extra-sensory and ability-to-relate skills are not given adequate opportunity to use their skills in gatherings of intellectuals. In a meeting of specialists this may

be justified, but in gatherings which attempt to view the future holistically this will surely detract from their value and effectiveness. Whilst wishing to involve as many others in the preparation of this paper as possible one realised that constraints of 'biologically defined valency' and 'channel capacity' (See: Yona Friedman, "The Critical Group Size", pages 44-45 "Sector", AD/1/73) are unavoidable. One means of attempting a compromise was to involve practically orientated, average ability pre-nursing and building technician students at the Huddersfield Technical College in the formulation of an informative questionnaire for use either in a discussion or group situation. Ideas which had come up in earlier discussion about people's hopes and fears for the future formed the basis for a series of questions to stimulate discussion and heighten awareness of the interdependence of evolution, energy, population and participation issues, thereby enabling a more informed feedback of ideas. Results of its use have so far been encouraging, though further simplification of language or even re-expression in local dialects may be necessary. This is partly overcome in the dialogue process:- people translate for each other. The willingness of the questioner to discuss people's answers with them and point out inconsistencies between answers to related questions is an essential part of the informative process.

It would be premature to draw too many conclusions from the more objective parts of the questionnaire, but people's awareness of the issues, irrespective of age groups, appears to be higher than would be credited by many politicians, industrialists and academics. This is encouraging in terms of the potential for using the teaching computer and two-way cable link-ups in more sophisticated consultative and participatory programmes. However, people's response to this particular prospect for the future is often tinged with suspicion that they will not have choices over the alternatives with which they are presented because those in positions of power will continue to withhold information when this suits their purpose. They will wonder whether laws are being passed and institutions created to keep electorates quiet or for real implementation, and whether those in power are deceiving themselves even though they appear to mean what they say. They will ask whether new systems for participation which we develop are just new ways of deceiving them.

Secrecy, whether by governments on such pretexts as national security,

by academics to create a mystique about their brilliance or by industrialists when keeping the development of a new product hidden for fear of competitors, is particularly frustrating to the work of futurists. Alternatives for the future cannot be assessed realistically when essential information for such an assessment is kept hidden.

At present, schooling and society select and train human beings for a huge variety of roles along a spectrum from the person who is at the extreme of isolated, specialised, all-needs-met, pure research work to the person imprisoned in a unthinking, repetitive, manual earn-just-enough-for-survival existence. It would be hopelessly unrealistic to think that everybody who now feels alienated could instantly be fitted into a creative original role in a participatory net. If nothing else, the creators of the net would be uncertain of the truth of the information fed in by themselves or the viability of the links. Deceit is easy. Mistrust is cumulative, and a lot more effort will have to go into its eradication than into its perpetuation. People tend to accept their lot, and if they do blame others for their suffering and failure in life they often place the blame wrongly not realising the true causes of their misfortunes. (See: Paulo Frere, "The Pedagogy of the Oppressed").

Awareness of the world as it is today is hard enough to achieve. A complex chain of events and human inter-actions leading to a desired change over a period of several decades or more is beyond the envisaging of any individual. The ideal is unachievable unless we learn to use our minds in conjunction with others and we know not how many generations that will take.

In Section 5 and the Conclusion some possible compromise solutions are suggested, but first some more problems must be considered.

## SECTION 2:

IF WE DO NOT KNOW WHAT HAPPENED YESTERDAY HOW CAN WE KNOW WHAT WILL HAPPEN TOMORROW?

Let us consider briefly just how impossible it is to keep up to date with what is happening even in one's own specialism. Even if one knew

whom to contact by virtue of previously published books, articles, journal and newspaper reports, professional society membership, T.V., and radio appearances, etc., would be the best way to establish a dialogue in any given instance be through a personal meeting with or without others present, by telephone, by letter, through mutual acquaintances, by sending audio-visual tapes and/or samples of one's work and writings or by some combination of these and other means?

We know so little even of the totality of processes involved in a relationship between two people. A single chance event may act as a lifelong bond or become the catalyst that speeds up the breakdown of the whole relationship. An irrational prejudice about someone's appearance or mistrust of the party that they belong to may result in only platitudes being exchanged.

How does one make contact with people who have not yet publicised their work in the field of one's own specialism, who are newly applying skills from other disciplines or who are beginning to think <sup>deviously</sup> what the future for their work will be? Their work will be unpublished, and those who scan publications and journals will be unaware of its nature and significance. No record will appear in directories of future researchers.

In order to test the feasibility of obtaining such information by unconventional methods I went to Ireland for two weeks in January (An additional reason for the choice of Ireland was that very little information about future studies in that country was circulating amongst future researchers in other countries). By using existing networks of people there and following up a series of personally recommended contacts it was possible in this short period of time to begin to put together a very complex picture of people looking to the medium-long term future from a great range of perspectives. A wonderful richness and variety of imaginative future-oriented work became evident - surely unsuspected by so many English who regard the Irish as a primitive, superstitious and obsessively religious people! To do such a study is immensely rewarding in its own right, and this is further enhanced by the satisfaction of knowing that one's work is also of instant use as a catalyst and encouragement to those who feel they are working in isolation and who appreciate the need for bridges to be made between themselves and others previously unknown to them. Clearly there is a special task

for the facilitators and go-betweens in futures research and documentation. But, there is still a need for the development of appropriate technologies to support their work and to disseminate its findings.

If even specialists cannot keep track of the work and ideas of their fellow specialists how many orders of magnitude more true is this for the futurist who is attempting both to futurise and to act as a link between the futurising elements in existing specialisms?

Fortunately for our peace of mind, for most of the time when engaged in such an operation we do not have to delude ourselves that we have achieved perfection in order to experience satisfaction and continue with our task.

Futurists have less excuse than others for being arrogant because they have so many opportunities to realise how little they know, whilst their work increasingly involves them with consideration of futures which will be played out by those not yet born.

### SECTION 3

#### THERE WILL NEVER BE PERFECT WEATHER FORECASTS OR WEATHER MODIFICATION PROGRAMS

The weather forecaster can predict quite accurately what will be the frequency of wrong forecasts he is likely to make of a given weather element assuming a certain level of desired precision. However, with each individual forecast he has to form a conviction of what is most likely and also what might happen before recommending action accordingly. He knows very well that considerable variations of weather may occur within short distances and many different kinds of action could be taken based on his one forecast. His awareness that one of those wrong forecasts might be made on an occasion when a particularly hazardous weather type actually occurs, results in his being extra cautious and deliberately warning of the possibility of such a weather type even the risk appears relatively small. Thus the person who predicts the weather is a forecaster of the weather and also a creator of people's responses to weather predictions.

The weather forecaster wants to know as soon as possible of the appearance of a significant change in any of the many factors which might cause him to change his forecast. Yet he knows that he must work with very imperfect data even though in recent years he has been helped by an enormous speeding

up of the transmission and analysis of weather data. Awareness of these factors has led to an exceptionally high level of cooperation, compared with many other areas of human endeavour, between everyone from professors of physics to the amateur observer, all of whom recognise the need for accuracy and synchronising the timing and exchange of observations on a worldwide basis. This gives rise to an overview of the whole operation, and a consciousness of one's dependence upon observers in distant countries plus a feel for the effects on people in those other countries of the weather being experienced there. Many meteorologists allow their imagination to create images of the effects on human societies of exceptional storms, droughts and even climatic change. It is strange that more futurists do not come from this profession which is so futurised and conscious of the interdependence of all the components of the earth's one atmosphere and its interfaces with land, ocean and biosphere. Wherever the weather observer is stationed his observation is of potentially great importance in the understanding of the whole. What is more, he knows it, and this gives a special dignity to his work.

(The Rome Conference is focused onto "human needs" and later in this paper there is discussion of the importance of adapting work patterns to meet such human needs as dignity in one's work, rather than to satisfy artificially created consumer demands). Surely the worldwide weather observing and forecasting net could provide a model for communication which could be relevant to the ongoing solution of many other human, ecological and technological problems characterised by constant change and new temporary balances.

It should be stressed that worldwide cooperation in weather observing and forecasting is nowhere near having reached its ultimate objective. Yet there are surely lessons that the futurist can learn from the balance that meteorologists have already achieved between simplifying their communication procedures and at the same time maintaining a level of realism about the incredible complexity of the system which they are observing. A growing number of those in national weather services are specialists in physics, statistics, computer models, instrumentation, etc., but they are being counter-balanced by a growing number whose main concern is the effective communication of weather forecasts and climatological information to those

who must understand and act upon this information. There is no one whose activities are not affected to some degree by the weather and who does not make decisions which anticipate changes in the weather.

Much has been written, mainly in America, on the themes of intentional and inadvertent weather and climate modification. Initially, interest focused on commercial and economic considerations. Then associated legal and inter-state/international problems began to arise, and in the last few years ecological considerations have come to the forefront with their concentration upon the interdependence of all that happens in the air, on the land, under the surface of the sea and throughout the biosphere.

The most recent international gathering of meteorologists, ecologists, economists and sociologists to consider certain aspects of this interdependence was the N.C.A.R. Symposium on "Human Interactions with the Atmosphere" from 4 - 6 October, 1972, in Boulder, Colorado.

At this point I would like to record my indebtedness to Mr. J. Kennedy of N.C.A.R., for sending me by air mail at short notice, copies of some of the papers presented at this Symposium so that I could refer in this paper to material in them which would be of interest to futurologists.

The problem of the growing "empathy gap" between experts and those who do not know was referred to frequently in language as strong as: . . . "the most pervasive social conflict in the world today, and it should not be expected to diminish". The experts are expected to pour scorn on the "natural weather" movements which can be expected to arise.

Ian Burton of the Department of Geography, University of Toronto, on pages 19 and 20 of his paper, "Issues in the Design of Social Research for the Management of Atmospheric Resources", stresses the difficulty for physical and social scientists to communicate with one another.

"The oft reported failure goes deeper than incomprehension of language and technical terminology. It extends to cognitive styles, the ways in which different professional groups habitually structure their own thinking. Such barriers are impossible to remove or ignore".

He goes on to discuss the need for communication on the subject of research policy and direction and of increased awareness of how one is complementary



to the other.

Charles F. Cooper of the Center for Regional Environmental Studies, California State University, in the concluding two paragraphs of his paper, "Ecological Opportunities and Problems of Weather and Climate Modification", suggests that the advertising which has been used so successfully to stimulate excessive demand for water should now be employed to encourage greater efficiency of use, but he does not expect the cooperation of those <sup>whose</sup> goal is the sale of more water rather than the satisfaction of human needs.

Finally, Cooper stresses the urgency of developing inter-disciplinary research teams including those who will incorporate social consequences into weather modification scenarios at all levels up to the world scale.

At this stage it is worth noting the great range of opinion in the meteorological world about how resilient the atmosphere may or may not be to various kinds of human origin interference. Traditionally, and from recent discussions this would appear still to be the case, the British Meteorological Office rates the risk as negligible in the foreseeable future of man causing any alterations in climate on a large scale which are not well within the limits of normal climatic fluctuations or the more sudden effects of volcanic eruptions when these are powerful enough to throw large quantities of dust into the stratosphere.

Stanley A. Changnon, Jr., Head of the Atmospheric Sciences Section, Illinois State Water Survey, in his paper "Atmospheric Alterations from Man-Made Biospheric Changes" questions the conclusions of the 1970 M.I.T. SCEP Report "Man's impact on the Global Environment" that man-made changes to the biosphere will not produce global weather/ climate changes. On pages 40 - 41 Changnon concludes:

"The seriousness to man and the biosphere of slight global change in climate makes it important to consider all possibilities. Global change in climate caused by man is a subject of considerable public interest, but scientific study of it has been limited by scientific competence and proper data".

Finally in this section I would like to turn to two passages from James A. Crutchfield's paper "Social Choice and Weather Modification - Concepts and Measurements of Impact" which form a link with the theme of participation in Section 5 of this paper. On pages 48 - 49 he says:

"Attention has been focussed on the effects of weather modification on producers of goods and services, but it is apparent that most significant weather modification processes will reach deeply into the lives of individual householders as well".

"Imperfect perception of the effects of various kind of natural phenomena on individual business and households seems to be much too common to be dismissed as an aberration,....

"It goes without saying that research on perception is difficult, particularly in quantitative terms, but it is not less essential; and it illustrates perfectly the principle behind virtually all public policy in natural resource management - really precise data are, almost by definition, too late to be useful".

And on page 20:

"Since the political game is obviously loaded in favour of the beneficiaries, it would behove us to look carefully into the identification and management of external costs and to assure adequate representation in the decision-making process for those likely to be adversely affected".

#### SECTION 4:

WE DECEIVE OURSELVES IF WE CLAIM THAT REAL CONSTRAINTS UPON MAN DO NOT EXIST.

The more complex an eco-system becomes the more stable it is.

The more complex an organism becomes the greater its potential for consciousness

The more complex a human community becomes the greater is the chance of its survival after a part of it has been destroyed.

So, the way ahead would appear to lie in the direction of encouraging diversity, and being very cautious of any trend leading towards greater uniformity or even towards a world that is too safe and predictable.

The question that we must ask ourselves is whether consciousness of the present or of possible future alternatives is greater in a highly centralised society, nation or world community, or whether there is greater potential for diversity in a world with relatively weak channels of communication. (See Yona Friedman's paper - previously mentioned). Individually our minds tend to structure, simplify and build communicable conceptual models from the huge quantity of information which we take in through our senses during

a lifetime. Thus if we try to distinguish desirable goals for the future of mankind from the standpoint of ourselves as individuals we generally produce a blueprint or utopia which involves the universalising of certain desirable characteristics of the society which we happen to know. Conversely most dystopias and prophecies of doom progressively enlarge certain evils of today's world until these wholly envelop everything else.

Biologically the success of man lies in his adaptability and as members of human communities individuals are likely to have a number of specialised functions. Indeed, it is just this ability of different people to perform a variety of specialised tasks which has played such an important part in the recent rapid complexification of human societies. The number of these specialised tasks ('specialisms') is increasing rapidly. As a result, any individual can actually know, in a meaningful sense, a diminishing proportion of what is being done or thought by men on this planet even though the quantity of communications is increasing very rapidly. If the information contains the possibility of many different interpretations of and explanations for the same phenomenon this increases the likelihood that the recipient will experience information shock - probably leading to impatience, confusion or withdrawal from what refuses to make sense to him. Most futurists would say that it is particularly important to know in today's world what other people are thinking and doing. Quite apart from mutual suspicion, social reticence and official secrecy, there is the problem considered in Section 1 of the growth of a whole set of new languages which are still evolving, each known to like-speaking small circles of specialists. This may save specialists a bit of time when talking to other specialists who use their terminology in the same way (even that is not always the case), but is this worth the suspicion, impatience and even alienation which may be engendered amongst the uninitiated who also have a right to know?

None of us is above this constraint and certainly it is a barrier to attaining that holistic overview to which futurists aspire. Similarly, the most powerful politician or the most widely read academic is constrained by largely genetically determined or environmentally conditioned biological responses.

Our diversity means that we are not all 'equal'.

Indeed, to stress equality is often a prelude to the enforcement on others of uniformity. We need food, warmth and love throughout our lives, but the forms and quantities in which we receive these are constantly changing.

In fact, it is these changes that provide so many of the stimuli which man needs for his continuing physical, mental and spiritual development and well-being.

There is no universal blueprint for the meeting of need.

If all our needs were to be met a vacuum would be left and new needs would be created. We need to struggle and to have the satisfaction of overcoming fear and adversity. On the other hand it does not follow that, therefore, it is desirable to tackle world problems of hunger, homelessness, violence, etc., in a piecemeal fashion, claiming that whatever we do will only lead to new problems, even though we know that this is what will happen! i.e; we want to strive for the best solution at any given point in time though we know that no solution is perfect. On the other hand certain principles as to what must be avoided have become clearer in recent years.

LOVE, HATE: STABILITY, FEAR: CREATIVITY, BOREDOM: GENEROSITY, GREED -all tend to be cumulative, self-generating and to an unknown degree persistent. They are often played out in the work situation and it is to this that we now turn.

To achieve so-called full employment by creating dehumanising jobs, or perpetuating others that need no longer exist or that are socially harmful, is to solve a statistical not a human problem. In terms of both the far distant future and immediate threats to the internal stability of communities and nations it is essential to find out what forms of balance between work and leisure come nearest to meeting men's complex and constantly changing individual needs.

Ideally the meeting of these needs should include the satisfaction of knowing that what one is doing is really worthwhile to others now and in the future. What will the car assembly-line worker think when he sees the consequence of a sudden rise in petrol prices making motoring prohibitively expensive for half the poorer car owners who then could not even sell their vehicle because of the instantly created vast surplus? What would the cigarette packager or salesman think if his product became illegal? What will the ticket collector, insurance broker, banker and croupier think when money is abolished?

To try to end crime by employing more police, prison warders, judges, magistrates, lawyers, private security firms etc., can never be an ultimate answer even if it does satisfy electorates temporarily. In terms of the far distant future, the answer can only lie in people painfully and gradually reversing trends which are turning people away from a sense of responsibility for and curiosity about one another. To achieve this it may be necessary to re-create largely self-sufficient small communities as the context in which men's basic needs are provided. These should provide a secure base where socially harmful deviance could more easily be checked before it became a way of life, and where, with the help of recently improved insights such as group therapy through intermediate treatment programs in Britain. (See the Journal of the British Association of Social Workers - "Social Work Today" - Vol. 3, Numbers 23 to 25 - February/March 1973, in which David Thorpe wrote a series of three articles about an important experimental project designed to give the socially and educationally deprived a sense of self-worth such that they could participate far more effectively in the life of their community). The success of this work gives cause for hope that there are very few people who, if given the chance, cannot reach a minimal level of achievement, value and purpose - so necessary for the development of that self-esteem and sense of purposeful worth which is a pre-requisite of effective participation in the planning of the future for one's own immediate community.

There are some who would say that there would be no need for 'intermediate treatment' if only we could regress completely to some kind of idyllic equilibrium with the seasonal processes of nature, freed from all forms of unnatural stress.

However, there are powerful arguments against this position.

Fascination with the unknown and the yet-to-be-discovered, the search for spiritual experience and for the meaning of the three billion years of life which have preceded us on this planet, appreciation of beauty and love, are all such powerful forces that it is unthinkable that these could suddenly be fossilised. Dictators, priests, school teachers, social workers (to name but a few) have tried and continue to try from time to time to suppress these qualities because they conflict with the conceptual models they have of an ideal society. It is sad to say that they often achieve their aim because they catch the young before they have established their own identity.

It would seem that consciousness of one's unity with the rest of mankind can be realised through differentiation of one's own role in the local community.

The realisation of this will vary greatly depending on the cultural history of any given locality. Conflicts will continue to occur and the struggles to resolve them will continue to be a means for individuals to discover their own identities. Individuals will continue to have different needs for stress and challenge in order to realise the greatest possible amount of their potential. Therein lies our hope for the solution of the macro-scale problems to which we shall return after considering briefly some of the processes involved in effecting participation at the local level.

#### SECTION 5:-

##### THE TRANSITION FROM SCHOOLING FOR EXPLOITATION TO EDUCATION FOR PARTICIPATION.

The ideal of enabling all to participate provides a partial motivation for almost all experiments with new forms of education from nursery level to adult literacy programs and from catering for the mentally and physically handicapped to the needs of the most sophisticated researcher. We first learn to participate at the most immediate personal levels through the effects of our words and actions on those around us. People in positions of power who cannot be bothered to listen, or who like running other people's lives, may dull our responses to situations where concern would be normal or divert our attention from taking actions which might cause us to get the credit rather than them, but rarely is the motivation to participate so suppressed that the will to live is destroyed.

Where change is taking place very slowly in a stable society the communication which enables self-realisation is that which most effectively transmits the cultural norms and social expectations of that society to its new generations. Then later in life these provide a secure base from which to develop one's identity through the quality of one's relationships and the satisfaction of working to meet the needs of others who themselves will be appreciative of one's work. However, for most of us in today's rapidly changing world, participation must start within the context of a very confused and fragmented society, fraught with interpersonal, social and economic tensions. We find people seeking replacements for long-lost cultural identity through a great variety of means:- new religions, philosophies and political movements, new forms of art, sensuality and drugs, protest movements, communes, entre-

peneurial ventures, or even by attempts to re-create an imagined past. These may catch one's imagination, but most likely interest will quickly wane with a corresponding increase in cynicism and disillusionment. Sad to say, many educators tend to concentrate on these as a means of achieving the ideal of participation but do so at the expense of an essential prerequisite - namely, participation at the concrete operational level where learning and experimentation can be linked in attempts to find solutions to everyday problems of design, organisation, production, transportation, leisure activities, budgeting, caring for the needs of the sick and handicapped, entertaining, recycling waste, identifying and dealing with problems of pollution, repairing buildings and machinery, growing one's own food, combatting erosion and a whole range of activities which require direct participation.

Even such a programme as this is only likely to be effective if the value or utility of what is produced can be clearly identified and a conscious effort has been maintained at every stage to give all involved a chance to discuss each other's ideas and have them followed up in the creative productive process. I do not think that there is any easy way to by-pass this stage in the process of learning that participation is normal and a fundamental part of one's well being, and not something, the right to do which may suddenly be withdrawn at the whim of those in positions of power. The failure of so much schooling lies in its isolation from reality and the consequent absence of effective reinforcement of the desire to participate.

Most human abilities deteriorate quite rapidly with lack of use.

This is no less true of the ability and desire to participate.

There are many ways of providing the necessary 'exercise' for this ability varying from the Chinese model of frequent, relatively small, intensive, local group meetings designed to involve everyone in a searching on-going critique of one another, of their community and of its goals and plans, on the one hand, to a technologically highly elaborate system on the other. The latter might consist of multi-directional community cable T.V. linking people with whomever else they wished to communicate, aided by centralised data storage, retrieval and computing facilities. (The work of Stuart Umpleby and Valerie Lammont and of Arthur Harkins comes to mind - whilst concerning participation at the national or regional level Stafford Beer's 1973 Richard Goodman Memorial lecture "Cybernetic Praxis in

Government" - copies of which can be obtained from J.C. Parkinson, Brighton Polytechnic, England, - is one of the most brilliant and controversial recent contributions on this theme).

A concern of many futurists is how to futurise education, but most of what is written on this theme relates to the futurising of degree level, and post-graduate courses. However, to limit the availability of this experience to those who have been selected by virtue of their having certain academic skills only tends to perpetuate the division between those who have power over the future and those who are relatively helpless when it comes to determining their own future.

Who is to speak for them and in what language?

### CONCLUSION

ON HIS DEATHBED MAN MAY HAVE TO DO WITHOUT LUXURIES.

There are certain threats to man's survival which cannot be ignored except at our peril. It is these that make participation a necessity for everyone who believes that they have responsibilities as well as rights because to collude with a process that might lead to any one of these is inexcusable once the nature of the threat has been understood.

#### A. Direct threats to survival:

1. Nuclear warfare
2. Biological warfare
3. The destruction by heat, pollution, etc., of any one of the supposedly stable, self-rectifying, life-supporting systems in the biosphere (atmospheric circulation, oxygen production, ozone layer, bacteria, photosynthesis, etc.)
4. Terror, despair or escapism becoming dominant human values.

If a value of more than about 0.1% can be put on any of these risks then action to avoid them must be given priority over everything else - even, if necessary, over schooling, housing, medical care, famine relief and the other traditional ways in which people express their concern for others.

Those from Africa, Asia and South America who read this paper will wish to point out that it is the affluent Western world and Russia which has brought forward the potential for these crises to afflict mankind. They



may wonder why they should have to suffer whilst we dismantle our military industrial complex - no easy task!

In reply I can only say that we could be gambling with the lives of thousands of future generations - indeed with the whole destiny of mankind. Just because we cannot conceive yet what this will be, this is no reason for us to disclaim responsibility. So much has been grabbed and squandered in the past century that now we may have to pay an enormous price to make good what has been squandered. It is up to gatherings such as the Rome Conference to have the courage to spell out what this price is, who is to pay it and how.

The choice for the next generation could be between a world dictatorship and a participatory system to enable the necessary action to be taken. If our worst fears are unfounded there are still many other dangers to be faced which would require less costly action.

B. Indirect threats to survival: ones that could escalate to a point where a major disaster occurred.

1. Over-population and excessive demand for limited resources. (How much land must remain undominated by man to allow species to evolve naturally which could eventually be destined to supersede man?).
2. Inequality of distribution of the necessities for life.
3. The using up of a non-renewable resource before its replacement by a new source, all side effects of which had been taken into account.
4. Civil, urban or localised warfare.
5. Any significant increase in the prevalence of short-term self-interest as a motivating force for men's actions.
6. Long-term damage to soil structures.
7. Changes in atmospheric flow and ocean temperature stratification.
8. Depletion of ground water reserves making it harder to cope with drought.
9. New strains of germ or virus - perhaps as a result of immunisation policies.

10. Antibiotics used in intensive farming being ingested by man and making it harder to treat his illnesses.
11. Low levels of multiple pollution gradually producing genetic mutations or slowly altering people's personalities and mind functions.

Self-realisation takes place within an historical context.

The problems of our own age provide perhaps the most challenging and exciting context within the whole of history in which to achieve such self-realisation.

We are living through a great burst forward of evolution at the level of mind and consciousness. We can now see that it is imperative that we should learn to use communication to harness the energy of the noosphere. This can be done through maximising the participation of all minds towards the overcoming of those threats of life on this planet with which we are now confronted.

## DIMENSIONS OF FUTURE-TRAVEL/COMMUNICATIONS SUBSTITUTABILITY

By Lawrence H. Day

Bell Canada

I INTRODUCTION

The potential of future communications-based systems to stimulate some form of substitution for travel is a frequent subject of discussions of the future environment. Most forecasts seem to lie at two ends of a spectrum of possible analyses. At one end there are broad generalized scenarios optimistically postulating many forms of substitution of local and intercity travel through the use of a host of computer/communications services. The links between today and the future are not usually detailed, and we are left with considerable uncertainty as to how this future communications-based society evolved. The economic, social, and political benefits or potential negative impacts of this substitution process are also not examined in any detail. At the other extreme there are very specific studies of how specific technologies may augment the substitution process for individuals working at certain institutions with defined travel patterns. Between these two poles there is a considerable knowledge and research gap. This paper will review several projects underway at Bell Canada and several other institutions that are designed to help fill this knowledge gap. While many of the activities described here are Canadian or American, the author recognizes that parallel activities are also underway in Europe and Japan.

A. Definitions

The question of substitution may be regarded as a generic one for a macro-analysis. However, our futures research and that of others has

indicated that the subject should be examined on two levels: a) inter-urban substitution and b) intra-urban substitution. Inter-urban substitution refers to the process of replacing certain types of intercity travel with communications and computer based services. This travel is usually that of businessmen, government officials, or academics for defined occupational purposes. Intra-urban substitution refers to the process of replacing a wide variety of activities within an urban area with a large number of electronic services. These forecasts usually include replacing daily commuting to work with "electronic offices" in the home or in neighbourhood work centers. Electronic education, security, banking, shopping, voting, and consumer information retrieval services are also envisioned within the urban area in order to reduce the need to travel for many routine activities. Much of the research and speculation in this area is found in the "wired city" or interactive broadband systems literature.

The phrase "substitution" is used here as a shorthand expression that refers to very complex, mostly unknown (to date), relationships between the transportation and communications sectors of our society. This relationship is not new, of course, as these two sectors have been intertwined in a maze of relationships since the development of postal, telegraph, and telephone services. Research on the impacts of these old communications services upon personal travel has been extremely limited to date. The simultaneous rapid growth in the use of modern communications and transportations systems during the last few decades in North America has masked the development of interrelationships

between these two sectors. Studies have indicated that those who travel a great deal also use communications systems frequently. <sup>(1)</sup> Thus, existing communications and transportation systems appear to be mutually re-inforcing. However, many argue that the rapid proliferation of new communications technologies when combined with the current crises, congestion, and negative side-effects in many transportations systems will lead to a new era of substitution. <sup>(2)</sup>

The phrase substitution should also not be interpreted too narrowly in terms of face-to-face personal contacts. <sup>(3)</sup> While certain existing face-to-face contacts may be replaced in the future with new technologies, new forms of communications systems may create the ability to undertake activities that are impossible today with face-to-face contacts or existing technologies. Thus, substitution processes may, in fact, serve latent needs that have not been served to this point in time.

Various areas for futures research on the topic of travel communications substitution include:

- (1) technology - an explosion of communications and computer based technologies that will see widespread application in the next two decades.
- (2) information volume transfers - analysis of organizations as generators of information indicates that information transfer

volumes will increase greatly in the next fifteen years. The transfer of information rather than people will become a viable option.

- (3) cost/benefit - an assessment of many of the economic factors involved in a conscious evaluation of the costs of travel versus communications.
- (4) behavioural factors - recognition of the fact that a travel vs. communications question on an individual decision basis is related to much more than quantifiable cost/benefit questions.
- (5) energy, ecology, resource allocation, and pollution issues - development of concern in the "environmental" areas, especially as they relate to the transportation sector.

The remainder of this paper will review these dimensions in further detail. The final section of this Introduction will briefly overview the activities of the Business Planning Group in Bell Canada which is responsible for several of the research efforts outlined below.

B. Business Planning in Bell Canada <sup>4</sup>

Bell Canada is an operating telecommunications common carrier in the provinces of Ontario and Quebec in Canada. Certain portions of the Northwest Territories and Newfoundland (Labrador) are also served.

In addition to offering voice, data, and visual telecommunications services, Bell Canada owns a large manufacturing subsidiary (Northern Electric) and an R & D subsidiary (Bell-Northern Research). There are also several other subsidiaries in the telecommunications, directory publishing, and electronic components manufacturing fields. Northern Electric also has several internationally based subsidiaries.

Long term planning has been an established function in Bell Canada for many decades. This has resulted from both financial and technological factors. The large amounts of capital investment required to build and maintain a rapidly evolving telecommunications system have created a climate where the "futuraity" of current investment decisions has had to be continually evaluated. The basic constraint of ensuring new system integration with the existing telecommunications network has also created the requirement for long term technological planning. Forecasting in the past has also been oriented towards identifying both customer demand patterns and their changes over time. This has been especially important in the past decade with the rapid growth of computer based communications systems. The future will see continued rapid change with increasing emphasis on the developing visual communications field. The overall task has been to integrate the changing demand patterns and the newly available technology in order to produce a mix that provides high quality service at the lowest possible cost.

The Business Planning group was formed to explore the intermediate and long term future on a much broader base than in the earlier long term

planning efforts. This meant that the group would have to conduct new forms of research and planning, and not duplicate or consolidate the existing planning and forecasting functions in Bell Canada. The Business Planning group's basic objective is to:

"... identify future business opportunities or potential threats to the corporation".

These opportunities or threats are those that might arise through technological, social, or market developments in the intermediate (5 to 15 years) future. The group's responsibility is to identify future events that might require some form of management action. While Business Planners are not short term planners or project implementers, they do have the responsibility to generate executive decision options in the short term which are designed to move the corporation towards exploiting the identified future opportunities or avoiding the potential threats. This philosophy is in keeping with the viewpoint that decisions are not made in the future, but today, even though they may be based upon expectations of a future development. The Business Planning group has spent the last five years conducting extensive technological forecasting activities in order to fulfill objectives. It has utilized the following techniques, among others:

Delphi: 6 major studies on the future of educational, medical, computer, and "wired city" technology



Trend Analysis: subjects such as GNP, the telecommunications industry, population, the computer field, etc.

Cross Impact Analysis: technology assessment of computer-assisted-instruction

Substitution Analysis: several projects emphasizing future potential trade-offs between travel and communications

Scenario Building: future Canadian environment, technological trends

Behavioural Analysis: in-depth surveys of expectations regarding future communications services

Increasing emphasis has been placed upon researching the societal impacts of telecommunications systems in the past two years. The group has conducted one Technology Assessment and has three more in progress. Subjects of research include:

Computer Assisted Instruction (completed)

Travel/Communications Tradeoffs

"Wired City" Services

Impact of Satellite Telecommunications upon Inhabitants of the Canadian North

Members of the group have prepared over twenty working papers and studies in the above areas that it trades with other research groups on a quid pro quo basis.

The above elaboration may help illustrate how the substitution project fits into the overall Business Planning futures research program. This paper will now turn to an examination of some of the technology-initiated factors that have created widespread interest in this subject.

## II THE TECHNOLOGICAL IMPERATIVE

Much of the interest in the question of substitutability has resulted from a recognition that the new communications and computer technologies offer many capabilities that may reduce the utility value of personal travel when compared to these services. Promoters of specific technologies often claim that their innovation alone will reduce the need for travel. These claims are optimistic and perhaps unfounded when viewed in isolation. However, the combined capabilities of the various emerging technologies will certainly have an impact on the substitution issue. Several of the major thrusts in the technology area are reviewed below.

### A. Two-Way Broadband Systems

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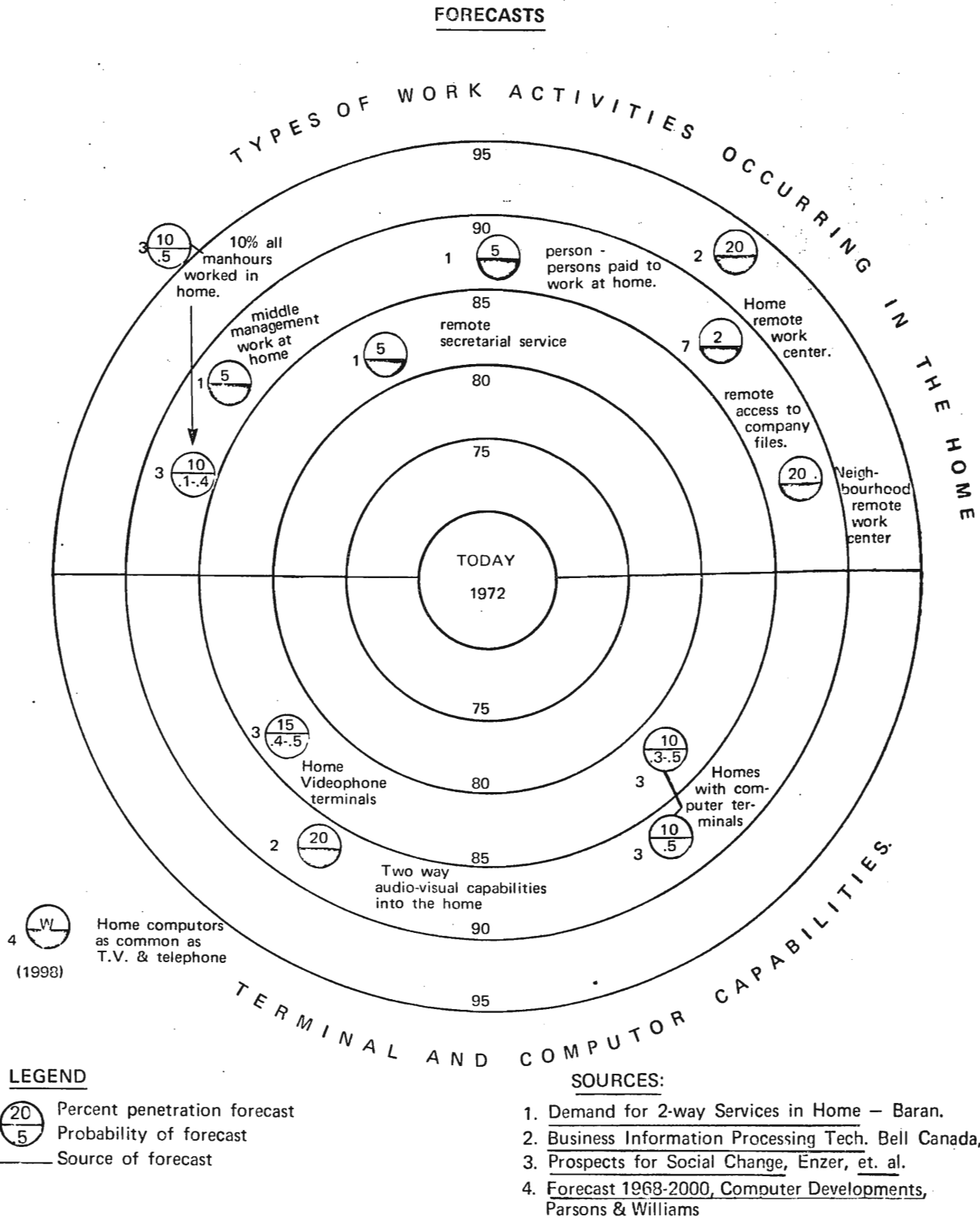
Most of the literature in this field has been concerned with an expansion of the capabilities offered by co-axial cable currently being used to deliver cable T.V. signals. These broadband channels can be converted to interactive use through the use of additional electronics

to provide low speed (audio grade) or broadband (video grade) return paths from the receiving location to the central distribution point (the "head end"). These return path capabilities can also be provided through the use of the regular telephone channel. The significance of these systems is that they create the ability to deliver "on demand" or selective visual information over the broadband channels. These systems have the theoretical capability over time to add random switching so that each subscriber can call any other subscriber in a fashion similar to telephone calls today. These calls could be audio, audio graphic, or audio visual in nature. It is still questionable whether the providers of cable systems will invest the additional capital required to provide these types of capabilities.

Two-way broadband systems could provide a certain amount of selective, private delivery of information to subscribers in residential areas leading to some forms of intra-urban substitution (where most systems are installed and will be installed for the next decade or so). These possibilities have led to a number of forecasts on the potential of working from home. Several of these forecasts are shown in figures 1 and 2. <sup>6</sup> Figure 1 displays a number of projections from various Delphi studies that have considered this question. <sup>7</sup> Figure 2 indicates the results of a Bell Canada Delphi which forecasted when 20% of the work force would be in a:

- (1) Office Center - a central location is maintained but there is increased reliance on audio-visual capabilities to supplement travel.

FIGURE 1  
COMPUTER/COMMUNICATIONS SERVICES SUBSTITUTING FOR INTRA-URBAN BUSINESS TRAVEL



**FIGURE 2**  
**INTRA-URBAN TRAVEL SUBSTITUTION**

	70-75	76-80	81-85	86-90	91-99	LATER	NEVER
1. OFFICE CENTER		◊ M					
2. HOME REMOTE WORK CENTER					◊ M		
3. NEIGHBOURHOOD REMOTE WORK CENTER				◊ M			
4. WORK LOCATION(S) APPROPRIATE TO THE JOB IN ORDER TO MAKE BEST USE OF TIME AND SPACE				◊ M			

◊ = median panel response

Source: Daniel Z. Goodwill, An Exploration of the Future in Business Information Processing Technology, Business Planning Bell Canada, Oct. 1971, (Proprietary) P. 33

- (2) Home Remote Work Center - located in an employee's home with access to computer and communications capabilities as required.
- (3) Neighbourhood Remote Work Center - within walking distance of employee's home. Has work space equipped with required computer-communications capabilities.
- (4) Mobile Worker - employee uses portable terminals with required input/output capabilities. ③

The availability of a host of consumer oriented capabilities have also been forecasted by those expecting the development of a "wired city" (a misnomer since most cities are already wired for power and telephone systems). These services include:

- remote shopping
- remote banking
- electronic security services
- electronic education
- electronic voting
- consumer information retrieval systems
- remote medical systems

The use of these technologies could also lead to substitution of certain forms of non-work intra-urban travel. The Business Planning group has conducted a modified Delphi study of the potential acceptance of these

types of services in the home. The results of this research are described elsewhere and will not be reviewed here for the sake of brevity. <sup>(9)</sup> This work is being continued currently with a detailed Technology Assessment of the positive and negative secondary impacts that may result from the use of "wired city" services. <sup>(10)</sup> The intra-urban substitution issue is one of the items that will be reviewed in this project. There are other technologies that are generating interest in the substitution thesis. One of these is video teleconferencing.

#### B. Visual Telecommunications Technologies

The use of visual telecommunications technologies to augment substitution has been forecasted by many observers. Interpersonal visual communications can take the form of randomly switched calls between individuals using a technology like the U.S. Bell System's PICTUREPHONE<sup>R</sup> system. Interpersonal visual communications can also take the form of point-to-point teleconferences between groups of individuals using systems like CONFRAVISION in the U.K. or Bell Canada's CONFERENCE T.V. system. Both of these systems offer the ability to interact with images of people at remote locations and to share pictures, diagrams, graphics, etc.

Bell Canada is currently operating CONFERENCE T.V. on a trial basis between Montreal, Toronto, Ottawa, and Quebec City. <sup>(11)</sup> The Federal Department of Communications is cooperating with Bell Canada in an evaluation of this system from technological and future user needs viewpoints. <sup>(12)</sup> The Systems Engineering group at Bell Northern Research

is also assisting in this evaluation project. The analysis data from user interviews and detailed user questionnaires will provide new information on the ability of these types of systems to help replace certain types of intercity travel for group meetings or to create the ability to hold meetings that would not have taken place if travel was necessary. However, it should be restated here that significant future substitution would not be expected to take place through the use of CONFERENCE T.V. or videophone alone. It is the combined pressure from the overall collection of technologies capabilities that is being reviewed here.

#### C. Communications Satellites

Communications satellites have grown from experimental vehicles to key components of national and international communications systems in the past decade (both for broadcast and interpersonal communications). Canada is the first country in the world to use synchronous orbit domestic satellites for broadcast and interpersonal communications within a nation. While there are abundant East-West communications systems within Canada, the satellite permits communications into the far North of Canada where other systems could only provide delayed broadcast or periodic telephone service. This technology is viewed as an important means of linking residents of the North into the communication mainstream of Canadian life.

Satellite systems have many enthusiastic supporters and they will surely provide new communications capabilities to those who have not



had access to them in the past. However, past experience with new technologies over time has indicated that there are often unforeseen secondary positive and negative impacts that arise from their use. The Business Planning group recognizes this and, as noted above, has undertaken several Technology Assessments of emerging communications technologies. The impacts of the use of Canadian domestic satellites upon residents of the North will be evaluated by an interdisciplinary team at Queen's University in Kingston, Ontario under a research contract from Business Planning. New insight into the relationships between information transfer and Northern travel patterns is expected to flow from this study.

Communications satellites may also be a factor in other substitution questions as well. These satellites have been projected as means of linking up many urban cable t.v. or local broadband systems into nationwide networks. They may also be used to provide lower cost video channels for interpersonal visual communications systems such as videophone or CONFERENCE T.V. However, in both of these cases, their impact is secondary since the satellite only provides raw communications channels to these other systems which provide user oriented services that could augment the substitution process. Analysis of the impact of future broadband communication or visual teleconferencing systems should include the impact of any satellite communications as a sub component rather than as an entity in itself.

#### D. Information Storage and Retrieval Systems

Communications technologies in themselves are not the only technologies that will have an impact upon the substitution process. The complex merging of computer power and communications systems is leading to a whole new order of technologies that are of significance. The development of "on-line" (i.e. communications linked) time sharing systems that provide a host of personalized information storage and retrieval capabilities, text editing, and computational power is creating the possibility of utilizing remote work centers with the required access to computer systems needed to accomplish a task. Developers of very advanced, but user oriented (the "dumb" user from a computer viewpoint) systems see them as creating "augmented knowledge workers" over time. <sup>13</sup> They foresee an evolution in work styles and capabilities as knowledge or post-industrial workers utilize the power in these systems. This could have considerable impact upon the intra-urban substitution question since these systems can be routinely accessed from any location that has a telephone. <sup>14</sup>

#### E. Computer Networks

The evolution of several advanced forms of computer networks in North America will reinforce the tendencies outlined in the above section. Linking through relatively inexpensive communications networks permits specialization of computer capabilities at various geographic locations. The Advanced Research Projects Agency (ARPA) has financed the development of one such system in the U.S. which is now being extended (via satellite) to Europe and the Far East. <sup>15</sup> This "resource sharing" of

specialized computer systems will assist in further augmentation of knowledge workers and impact upon the need for both intra and inter urban travel.

F. Computer Augmented Conferencing

Computer Augmented Conferencing is a concept that was developed and promoted initially by Dr. Murray Turoff, formerly of the Office of Emergency Preparedness, Executive Office of the President. (b)

Computer-Augmented Conferencing connects a number of individuals with computer terminals to the computer in a synchronous or asynchronous mode, permitting them to approximate the interactions that they might experience if they were engaged in face-to-face communication as well as providing new capabilities not currently available with face-to-face or electronic communications. The number of participants in a Computer-Augmented Conference can vary from two to as many as twenty or more. Since the communications process is asynchronous, many conferees can input their comments to the conference at the same time; when they have finished inputting, the computer delivers the messages that have arrived during the input phase. A text editing facility may also be included in the C.A.C. package.

Computer Conferencing provides another means of merging computer and communications systems power to help create alternatives to travel. The technique is also being used as a research vehicle by the Business Planning group. In the past, audio teleconferences have been sponsored by the group between over twenty different individuals associated with

institutions studying various aspects of the substitution question. This program is being expanded to include interactive computer conferencing on the same subject. An initial experimental computer conference on substitution is underway between three groups at Institutes in California, a Washington agency, a research group in London, England and the Business Planning group. This will be expanded in the next few months to several dozen groups interested in various aspects of substitution. This conference will utilize the FORUM computer conferencing system developed by researchers at the Institute For The Future. A version of the Turoff system is operational as well on a computer at Bell Northern Research. This system is also being used for more limited information interchange on the question of substitutability. Hence, in this case, the technology (computer conferencing) is being used to help study the question of substitution as well as act as another possibility for augmenting substitution.

#### G. Technologies, Conclusion

This analysis of the technological issues that are stimulating interest in the substitution area is only a brief overview of the possibilities that are emerging. Each of the technologies discussed above can be explored in much greater detail in the various references given. Many other relevant technologies have not been discussed which will have a bearing on the future process of substitution. These include: intelligent terminals, video discs and cassettes, audio cassettes, video data banks, audio data banks, computer based education systems, facsimile transmission, graphic communications, still frame t.v.

transmission, artificial intelligence systems, and voice inputs to computers. The main purpose of this section of the paper was not to be all-inclusive in its discussion or to review any particular technology in detail. The objective was to give a flavor for the technological revolutions whose combined strength will certainly cause a conscious re-evaluation of many future decisions to travel.

### III INFORMATION VOLUME TRANSFERS

Another means of approaching the substitution analysis is to regard various institutions as generators and transmitters of information. The demand for the technologies examined in part II arises from the fact that organizations are becoming information dependent. Many forms of travel can be viewed as transactions involving information exchange. The surveys of Thorngren in Sweden regarding information transactions in business have led to the development of several hypotheses regarding types of communications profiles.<sup>18</sup> His work indicates that only certain routine types of information transactions can be substituted for by communications.

The Center for Futures Research at the University of Southern California is also using the information transfer model approach for studying potential intra urban substitution.<sup>19</sup> A large insurance firm in Los Angeles is being analysed in detail in order to determine the actual flows of information within the business. This data will be used to build an information flow model and enable the researchers to pinpoint the potential for substitution of personal information transfer with electronic information transmission.

A Business Planning group's survey of business travellers is expected to produce data that will fit into information transfer models. The group is also conducting information transfer research at the opposite end of the spectrum. Stanford Research Institute is conducting a private study for Bell Canada and the Trans Canada Telephone System designed to forecast the volumes in information transfer in Canada from 1972 to 1985. <sup>(a)</sup> These estimates will be broken down by industrial category, geography, and computer system characteristics. The research will produce estimates of substitution of various paper transfers in society today with electronic information transfer in the future. While this is not substitution of travel for communications per se this form of substitution analysis is related to this subject of information flow modeling. The combination of both the macro and micro results will permit a more thorough understanding of the potential of information transfer technologies to augment future travel substitution processes.

#### IV COST/BENEFIT ANALYSIS

The cost/benefit approach to the substitution question is a "rational man" technique for examining how certain forms of travel can be substituted for by a collection of computer/communications capabilities such as those outlined in section II. These analyses are normally for inter-urban substitution. Cost/benefit analysis reviews the dollar costs associated with travel and those associated with the communications substitute and determines which alternative is the least costly. <sup>(a)</sup> The costs of travel normally include those of the transportation common carriers, the time

(converted to dollar costs) spent in meetings and the travel time consumed during a trip. The communications costs are those involved in leasing the system configuration used for teleconferencing.

Most cost/benefit analyses conducted upon expected lease rates for system configurations discussed in section II tend to reinforce travel rather than communications. This is especially true for video based systems. The cost/benefit ratio can be shifted somewhat in the case of busy executives whose time is scarce and must be rationed between demands. This factor, plus convenience and status factors accounts for the use of executive jets which could not be rationalized in a true cost/benefit analysis. <sup>(Aa)</sup> The use of new communications systems could substitute for some types of needs but this is definitely a slender slice of the potential range of users for substitution capabilities.

The use of cost/benefit analysis is a normal procedure in business and government procurement of various products and services. However, there are many types of "costs" that cannot be weighed in normal economic assessments. These costs are often not even borne by those who make the decision on economic grounds. The non-economic factors may also be the most important ones in the future when major decisions are made on substitution issues. These factors include a host of background behaviour attitudes towards travel and communications systems. Concern for the environmental costs associated with travel are also important ingredients in an expanded cost/benefit equation.

## V BEHAVIOURAL ISSUES

An adequate analysis of the intercity substitution question must examine the fundamental reasons why people travel. There are obvious stated occupational reasons for any travel activities. However, there are a host of unstated social and personal factors at work when present travel decisions are being made. An understanding of the travel/communications substitution issue requires research into these behavioural factors that would also underly any future decisions on substitution.

The Business Planning group is currently undertaking an analysis of these issues. This research is concerned with business travel in Canada between the cities of Montreal, Toronto, Ottawa, and Quebec City. Business travellers between these cities utilizing air, rail, auto, or bus modes of transportation will be given a questionnaire to determine:

- a) basic trip statistics
- b) purpose(s) of meeting(s)
- c) information carried to or acquired at meetings
- d) reasons for not substituting this trip with existing communications media
- e) indirect personal activities associated with the business trip
- f) the potential of various future communications capabilities to replace the type of trip the traveller is currently on
- g) organizational, personal, statistical data on the individual respondents



The questionnaire will be given to 45,000 business travellers during October 1973 (draft questionnaire shown in Appendix A). Approximately 15,000 usable replies are expected which will permit detailed sub-analysis of the substitution question by mode of transportation, corridor, organizational characteristic, language or substituting technologies. This response estimate may be regarded as a minimum response since a pre-test of the survey has indicated a much higher level of returns than expected. This in itself may indicate that interest in the substitution question is becoming widespread among travellers.

The data from the survey will be shared with the participating common carriers and government agencies. This information will also be traded with individuals and groups who are working on similar or related issues in outside futures research agencies. While the Business Planning theories towards the substitution question are probably clear by this point, it may be useful to review the hypotheses associated with this study:

- a) In the future the volume of transportation and telecommunication interactions will increase considerably.
- b) The length of time spent on business trips is attributed more to the nature of the communication activities engaged in than it is to the time - distance aspects associated with trip taking.
- c) Travel for intrafirm integrating activities is greater than travel for interfirm activities.

- d) The propensity to substitute telecommunications for travel is greater for trips which involve the personal transportation of information than for trips which primarily involve material aspects.
- e) The propensity to substitute increases after a certain threshold of trip making is reached; the threshold varies depending upon the purpose of the interaction.
- f) As the complexity of the communication task increases, the greater is the perceived felt need for face-to-face contact.
- g) Routinized interaction activities have a lower trip threshold and a greater propensity for substitutability than more complex, non-routine interactions.
- h) If communication within the organization itself is one of the major functions of trips, then the propensity to substitute is higher where this interaction is of a routine nature.
- i) The business firms that will be most affected by new telecommunication services will be those which are geographically dispersed. (24)

Similar research has been undertaken by Reid in the U.K. in an analysis of U.K. government employees' attitudes towards substitution and decentralization of the government civil service from London. (25) Comparison of results between the two studies may also reveal information on

cross-cultural differences in attitudes and on differences between the attitudes of government employees and businessmen towards substitution. This analysis should permit the Business Planners to develop behavioural data to add to the cost/benefit factors associated with the substitution question.

## VI ENVIRONMENTAL ISSUES

There are a host of environmental issues related to travel and transportation systems. These have become increasingly important ones in public and private policy determination in the past decade. One simplistic forecast is that these factors may lead governments to promote or encourage communicating rather than travelling in the future. This could be through a wide variety of administrative mechanisms, including ones that may alter the economic cost/benefit ratio in favour of communications alternatives.

The environmental costs associated with transportations systems have become identified in considerable detail in the past decade. Current research is expanding information on these issues at a rapid pace. The environmental considerations associated with communications systems are virtually unknown although recent interest has been expressed on the subject. Intuitive analysis leads many to believe that these costs are far less on a per capita user basis than those for transportation systems.

Any comprehensive analysis of the environmental costs associated with travel and communications systems must go beyond an examination of

operational costs of visible structures. The costs of construction of the physical plant required to provide these services should also be included. The environmental costs associated with maintaining the required infra structures are required as well.

The phrase "environmental costs" has been used to refer to a wide variety of issues. These include:

- a) energy consumption of transportation or communications systems (increasingly important with the North American and European "energy crisis").
- b) energy consumption required to construct, operate, and maintain the manufacturing plant, and industry infra structures for both sectors.
- c) resource consumption for construction, operation and maintenance of the required infra structures.
- d) pollution factors associated with the two industries, e.g. air, water, radiation, noise, thermal, and visual pollution.
- e) damage to ecological systems. (26)

This list is not exclusive but it gives an indication of the variety of environmental costs that are associated with the use of transportation

and communications issues. These factors will have to be added to the economic and behavioural ones in order to provide an adequate analysis of the overall question of inter-urban and intra-urban substitution.

The Business Planning group has initiated a research project in this environment area. An initial module of the research will assemble the view on transportation since this area has received the most attention to date and will not require significant original research. The communications sector will be analysed in the second module. Considerable original research will be required to identify the present and future patterns of environmental costs associated with communications systems. The combined results of these two studies will permit us to assemble an overview of this issue.

The energy implications of communications systems are receiving attention at the Stanford Research Institute where a detailed proposal for research has been prepared. <sup>(27)</sup> The Office of Telecommunications in the U.S. Department of Commerce is also investigating this question. The Business Planning group and the Office of Telecommunications are also sharing data on this question through the medium of a dedicated computer conference on the subject.

## VII CONCLUSIONS

This paper was not designed to provide any new significant answers on the question of travel/communications substitution. It is, however, an

attempt to indicate how complicated the question has become. Specific futures research projects underway at Bell Canada and other institutions in North America and Europe are attempting to untangle the maze of relationships that exist between the transportation and communications sectors of modern industrial societies. Some of these relationships are mutually reinforcing, others may rely upon the substitution concept. The growing shared pool of data on the subject should help isolate the myths and wishful thinking and identify the economic, social, and environmental factors associated with future opportunities for substitution of travel with communications services. The stimulus of new technologies and requirements for large volumes of information transfer will continue to create the need for futures research designed to help answer the questions outlined here.

Footnotes

1. James H. Kollen, Transportation - Communication Substitutability: A Research Proposal, Business Planning, Bell Canada, Montreal, Que., Feb. 1973 (revised edition), (Proprietary).
2. See for example Jerome B. Wiesner, "Human Communications", International Communications Association Conference, May 1973.
3. This has been discussed by Reid in his report to the Sloan Commission on Cable Communications: Alex Reid, New Directions in Telecommunications Research, Communications Studies Group, Joint Unit for Planning Research (University College London and London School of Economics), London, June 1971, pp.4-6.
4. Further details on the Business Planning group's activities may be found in:  
Lawrence H. Day, "Long Term Planning in Bell Canada", Long Range Planning, Vol. 6 (No. 3), September 1973.  
and  
Lawrence H. Day, "The Corporate Role in Technology Assessment: A Case Example", First International Congress on Technology Assessment, The Hague, The Netherlands, 29 May 1973. Also in the Journal: Technology Assessment, forthcoming Nov. 1973.

## 5. Studies here with detailed descriptions include:

Walter S. Baer, Interactive Television: Prospects for Two-Way Services on Cable, Rand Corporation, Santa Monica, Calif., Nov. 1971.

Paul Baran, Potential Market Demand for Two-Way Information Services to the Home (1970-90), Institute for the Future, R-26, Mento Park, Calif., Dec. 1971.

Michael T. Bedford, The Future of Communications Services in the Home, Business Planning, Bell Canada, Montreal, Quebec, Nov. 1972, (Proprietary).

Sloan Commission on Cable Communications, On the Cable: The Television of Abundance, McGraw Hill, New York, 1971.

Ralph Lee Smith, The Wired Nation, Harper Colophon, New York, 1972.

6. Lawrence H. Day, "The Future of Computer and Communications Services", National Computer Conference Proceedings, AFIPS Press, Montdale, N.J., June 1973, p.730.
7. Diagram data sources shown in footnotes on above paper, p.734.
8. Daniel Z. Goodwill, An Exploration of the Future in Business Information Processing Technology, Business Planning, Bell Canada, Montreal, Quebec, Oct. 1971, p.32 (Proprietary).



9. See: Bedford, The Future of Communications Services ...  
Day, "The Future of Computer ..."  
Day, "The Corporate Role in Technology Assessment ..."
10. Michael T. Bedford, A Technology Assessment of Future Home Communications Services: A Study Proposal, Business Planning Paper #12, Business Planning, Bell Canada, Montreal, Quebec, May 1973.
11. "Now - Conferencing by T.V.", Montreal Star, Montreal, Quebec, September 18, 1973, P.B1.
12. Department of Communications, Teleconference User Opinion Questionnaire, Ottawa, Ont., 1973.
13. Douglas C. Engelbart, Richard W. Watson, James C. Norton, "The Augmented Knowledge Workshop", National Computer Conference Proceedings, AFIPS Press, Montdale, N.J., June 1973, p 9.
14. Members of the Business Planning group will be testing this concept in real life for the next year. The group has subscribed to an experimental system to be run by Engelbart's group and will test many of the work-from-home and information retrieval capabilities. This experience will be evaluated on a scientific basis to determine the positive and negative changes in group behaviour and output over the length of the experiment.

15. Two collections of papers that explain this concept in detail may be obtained from ARPA:

Resource Sharing Computer Networks, Advanced Research Projects Agency, Department of Defence, Washington D.C., 1972 (session presented at Spring Joint Computer Conference, Atlantic City, May 7, 1970).

The ARPA Network, Advanced Research Projects Agency, Department of Defence, Washington D.C., 1972 (session presented at Spring Joint Computer Conference, Atlantic City, May 16, 1972).

16. Now with Newark College of Engineering, Newark, N.J., Papers on this system:

Murray Turoff, "'Party Line' and 'Discussion' Computerized Conferencing Systems", International Conference on Computer Communications, Washington, D.C., Oct. 1972.

Murray Turoff, "Delphi Conferencing: Computer-Based Conferencing With Anonymity", Technological Forecasting and Social Change, 3, New York, 1973.

17. For description see:

A.J. Lipinski, H.M. Lipinski, R.H. Randolph, "Computer-Assisted Expert Interrogation: A Report on Current Methods Development",

Technological Forecasting and Social Change, 5, New York, 1973.

18. Kollen, Transportation ..., pp.16-17.
19. Paul Gray, "Development of Policy on the Transportation - Telecommunications Tradeoff", memorandum, Center for Futures Research, University of Southern California, Los Angeles, Calif., 1973.
20. A similar but less detailed study was conducted by SRI for NASA in 1970:  
  
R.W. Hough, et al, A Study of Trends in the Demand for Information Transfer, Stanford Research Institute, Menlo Park, Calif, Feb. 1970.
21. See for example:  
  
Edward M. Dickson, Raymond Bowers, The Video Telephone: A New Era in Telecommunications, (a preliminary technology assessment), Cornell University, Ithaca, N.Y., June 1973, Chapters 10, 15.
22. Ibid., p.134.
23. James H. Kollen, About This Trip, (questionnaire), Business Planning, Bell Canada, Montreal, Quebec, Sept. 1973.
24. Kollen, Transportation, p.29.

25. Alex Reid, Report of Communications Questionnaire, Communications Studies Group, Joint Unit for Planning Research (University College London and London School of Economics) London, 1970.
26. Michael Katsoulis, internal memorandum, Business Planning, Bell Canada, Montreal, Quebec, Sept. 1973.
27. Edward M. Dickson, Systematic Comparison of Energy Consumed by Air Travel and by Telecommunications via Video Telephone: A Research Concept Paper, Stanford Research Institute, Menlo Park, Calif., Aug. 8, 1973.





BELL CANADA

## ABOUT THIS TRIP

### BACKGROUND

Bell Canada in cooperation with the major air, rail, and road carriers, and the federal and provincial governments of Quebec and Ontario\* is conducting a survey of men and women who are travelling on business along the major inter-city routes in Ontario and Quebec. The purpose of this cooperative study is to help better plan to meet your future travel and communication needs. Your answers and opinions are essential in helping us to serve you better.

### INSTRUCTIONS

**Air Travellers:** Our representatives will be available to collect your completed questionnaire after you have left the plane (please do not give it to the stewardesses). If you were unable to complete the questionnaire during your flight please mail it back in the envelope provided.

**Automobile Travellers:** Please fill out the questionnaire at your earliest convenience and mail it back in the envelope provided.

**Bus Travellers:** Our representatives will be available to collect your completed questionnaire when you leave the bus. If you have not been able to complete it, please ask for an envelope to mail it back to us.

**Train Travellers:** Our representatives will be available to collect the questionnaire before you leave the train. If you have not been able to complete it, please ask for an envelope to mail it back to us.

THIS QUESTIONNAIRE IS MEANT TO BE ANONYMOUS. IT IS NOT NECESSARY FOR YOU TO IDENTIFY YOURSELF OR THE NAME OF YOUR ORGANIZATION. THANK YOU.

James H. Kollen,  
Project Director,  
Bell Canada.

\*Participating organizations include the Federal Ministry of Transport – Transportation Development Agency, Canadian Transport Commission, Federal Department of Communications, Ministère de la Voirie et des Travaux Publics et Transports du Québec, Ontario Ministry of Transport and Communications, Air Canada, Québecair, Canadian Pacific Ltd., Canadian National Railways, Voyageur Inc., and Bell Canada.

## CHARACTERISTICS OF THIS TRIP

1. When you received this questionnaire you were travelling: (check one)
- |             |  |           |  |
|-------------|--|-----------|--|
|             | Toronto <input type="checkbox"/>         |           | Toronto <input type="checkbox"/>         |
|             | Ottawa <input type="checkbox"/>          |           | Ottawa <input type="checkbox"/>          |
| <b>FROM</b> | Montreal <input type="checkbox"/>        | <b>TO</b> | Montreal <input type="checkbox"/>        |
|             | Quebec City <input type="checkbox"/>     |           | Quebec City <input type="checkbox"/>     |
|             | Other (specify) <input type="checkbox"/> |           | Other (specify) <input type="checkbox"/> |
- 
2. You are (were) travelling by: (check one)
- |  |                                     |
|--|-------------------------------------|
|  | Automobile <input type="checkbox"/> |
|  | Bus <input type="checkbox"/>        |
|  | Airplane <input type="checkbox"/>   |
|  | 1st Class <input type="checkbox"/>  |
|  | Economy <input type="checkbox"/>    |
|  | Train <input type="checkbox"/>      |
|  | Club <input type="checkbox"/>       |
|  | Coach <input type="checkbox"/>      |
3. You are: (check one)
- |  |  |
|--|--|
|  | On your way to business <input type="checkbox"/> |
|  | Returning from business <input type="checkbox"/> |
4. (a) You will be (were) away on business for:
- |  |           |                                 |                          |
|--|-----------|---------------------------------|--------------------------|
|  | Less than | 1 day <input type="checkbox"/>  | <input type="checkbox"/> |
|  |           | 1 day <input type="checkbox"/>  | <input type="checkbox"/> |
|  |           | 2 days <input type="checkbox"/> | <input type="checkbox"/> |
|  |           | 3 days <input type="checkbox"/> | <input type="checkbox"/> |
|  |           | 4 days <input type="checkbox"/> | <input type="checkbox"/> |
|  |           | 5 days <input type="checkbox"/> | <input type="checkbox"/> |
|  | More than | 5 days <input type="checkbox"/> | <input type="checkbox"/> |
- (b) How many hours will be (were) actually spent in business meetings? \_\_\_\_\_ hours
5. (a) The reason(s) for taking this trip are(were): (check all appropriate categories)
- |  |   |
|--|---|
|  | Attend convention <input type="checkbox"/>                              |
|  | Attend training program <input type="checkbox"/>                        |
|  | See vendors <input type="checkbox"/>                                    |
|  | See customers <input type="checkbox"/>                                  |
|  | Meet with businessmen in another organization <input type="checkbox"/>  |
|  | Inspect your local operations <input type="checkbox"/>                  |
|  | See higher-ups in your organization <input type="checkbox"/>            |
|  | See peers or subordinates in your organization <input type="checkbox"/> |
|  | Other (specify) <input type="checkbox"/>                                |
- 
- (b) Primarily, the business meeting(s) will consist of (consisted of): (check appropriate categories)
- Information transmission** – exchange of information about recent events to keep current.
  - Exploratory** – identification, review of considerations basic to establishing a policy or plan of action.
  - Transactional** – airing conflicting views, discussion of incompatible factors, resolution by discussion and/or compromise.
  - Planning** – formulation of a plan, establishment of priorities, selection of alternative course(s) of action.
  - Implementation oriented** – development, assignment of responsibilities for action, scheduling.
  - Performance review** – monitoring work progress in one or more programs, projects or studies.
  - Crisis decision-making.**
  - Other** – please describe: \_\_\_\_\_

(c) Which of the following are you carrying to (from) the meetings? If you are returning from meetings, please indicate both those items you carried to the meetings and those items you acquired while at the meetings.

	Carrying (carried) to meetings	Acquired at meetings
Letters	<input type="checkbox"/>	<input type="checkbox"/>
Documents	<input type="checkbox"/>	<input type="checkbox"/>
Diagrams or drawings	<input type="checkbox"/>	<input type="checkbox"/>
Charts or graphs	<input type="checkbox"/>	<input type="checkbox"/>
Maps	<input type="checkbox"/>	<input type="checkbox"/>
Computer print-out	<input type="checkbox"/>	<input type="checkbox"/>
Photographs	<input type="checkbox"/>	<input type="checkbox"/>
Equipment	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify) _____	_____	_____
_____	_____	_____

6. (a) How many different meetings will (did) you attend on this trip? \_\_\_\_\_ meetings
- (b) How many business associates are travelling (travelled) with you on this trip? \_\_\_\_\_ associates
- (c) How many non-business associates (e.g. family) are travelling (travelled) with you on this trip? \_\_\_\_\_ non-business associates
- (d) In total, how many business associates will (did) you meet with on this trip? \_\_\_\_\_ associates
- (e) Do you expect that any of these will be new contacts? (Were any of these new contacts?) YES   
NO

7. Please indicate why it was not feasible to use either the telephone, the mail or TWX/Telex to conduct this business. In column I, first determine which reasons are applicable to this business trip, and then, for those reasons checked, please indicate in column II which method(s) had serious shortcomings in that area.

I		II			
REASONS	Check if reason applicable to this trip	METHODS	Telephone	Mail	TWX/Telex
Courtesy required	<input type="checkbox"/>	and method(s) not courteous enough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friendly relations required	<input type="checkbox"/>	and could not be maintained by method(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Background information required	<input type="checkbox"/>	and method(s) would not provide it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Security required	<input type="checkbox"/>	and method(s) did not provide enough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Persuasion required	<input type="checkbox"/>	and method(s) not persuasive enough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assessment of others' reactions required	<input type="checkbox"/>	but not permitted by method(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Group interaction required	<input type="checkbox"/>	but not permitted by method(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Needed to consult, exchange or, sign documents	<input type="checkbox"/>	but impossible with method(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Needed to consult or coordinate with associates	<input type="checkbox"/>	but method(s) not satisfactory enough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify) _____	<input type="checkbox"/>	but method(s) not satisfactory enough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____					
_____					





**TRAVEL ALTERNATIVES**

1. (a) In the near future it may be possible for you to accomplish many of the objectives of your business travel without actually travelling. Please indicate below how necessary each of the following telecommunication (electronic) capabilities would be to accomplish the objectives of this business trip.

<b>CAPABILITY</b>  (Assume no undue difficulties or delays in accessing or using these capabilities).	<b>NECESSITY</b>  of capability to accomplish the objectives of this trip (check one)		
	Of no use	Useful but not essential	Essential
The ability to talk to many separate groups or individuals at different locations all at the same time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The ability to transmit and receive facsimile copies of documents quickly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The ability to transmit and receive motionless pictures such as drawings, documents, X-rays, shots of people or black boards. These pictures change every 10-60 seconds as required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The ability to transmit and receive full television coverage including wide angle group shots and close-ups of faces or board sheets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The ability to write to any number of people simultaneously and interactively (rather than just reactively as by mail). This capability allows the users to carry on several streams of thought at the same time or to work at their own pace at different times.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The ability to add or erase visual information from any number of users' terminal displays. The information can come from both people and machines. The capability thus enables the multilateral discussion and alteration of charts, sketches, data files, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- (b) What other telecommunication (electronic) capabilities, if any, would you have required to meet the objectives of this trip?

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2. (a) If you could have had a telecommunication system with all the capabilities you indicated were useful or essential above in Question 1, would you have taken this trip?

- YES
- NO

(b) If you would still have taken the trip, please outline briefly some of the reasons why.

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To help us classify your answers, we would like to obtain some information about you, your organization, and your general trip taking pattern. It is not necessary for you to identify yourself and all information will be treated in the strictest confidence.

1. What is the total number of employees in your organization? \_\_\_\_\_

2. What is your level of management? Non-Management   
Lower Management   
Middle Management   
Upper Management   
Vice-President   
President   
Other (specify)   
 (check one)

---

3. What is the nature of your organization? Technical Manufacturing   
Non-Technical Manufacturing   
Retail and Wholesale Trade   
Construction   
Transportation   
Information and Communication   
Finance, Insurance and Related Industries   
Medical and Related Services   
Government   
Other (specify) \_\_\_\_\_   
 (check one)

4. How many years have you been employed by this organization? \_\_\_\_\_ years

5. What is your approximate gross income per year? Less than \$5,000   
5,000 - 9,999   
10,000 - 14,999   
15,000 - 19,999   
20,000 - 24,999   
25,000 - 29,999   
30,000 and over

6. Your Age \_\_\_\_\_ years

7. Sex Male   
Female

8. What is your mother tongue? French   
English   
Other (specify) \_\_\_\_\_

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9. Please indicate approximately how many business trips of each type you took in the last year.

Type	Number of trips
Attending conventions	_____
Attending training programs	_____
Seeing vendors	_____
Seeing customers	_____
Meeting with businessmen in another organization	_____
Inspecting your local operations	_____
Seeing higher-ups in your organization	_____
Seeing peers or subordinates in your organization	_____
Other (specify) _____	_____

10. If you had the choice would you like to \_\_\_\_\_ (check one)  
the number of business trips you take?

Increase

Decrease

Keep about the same

11. Are there any additional comments you would like to make concerning the topics of this questionnaire?

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**THANK YOU FOR COMPLETING THIS QUESTIONNAIRE.**

## TOPOLOGICAL STRUCTURAL SYSTEMS ANALYSIS

an aid for selecting policy and actions  
for complex socio-technological systems

By Lucien A. Gérardin  
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THOMSON/CSF

S U M M A R Y

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## 1 - SYSTEM, MODELS AND ALTERNATIVE SCENARIOS

Today's action causes both direct consequences and second-order consequences. And if the direct consequences led in principle toward the desired direction, the second order consequences often show themselves to be disastrous. Any genuine policy must integrate both. In order to set up a reasonable base for we must understand as completely as possible the structure of the object for which we wish *to outline a panorama of the alternative possible futures.*

By *object (\*)*, we designate here *a pattern of the world around us subject to investigation.*

In order to study them, it is necessary defining it still more in order *to design the system which describe this object* into operationally useful terms. The number of these terms is really infinite or better still indefinite. It is necessary to have the courage to limit them so that analysis is possible.

According to L. ZADEH (\*\*), we define a system as a set of *elements* and a set of *relationships that characterize the interactions between these elements.* This point of view emphasizes the behavioural aspects of objects and corresponds to a pragmatic philosophy, but not necessarily materialistic.

Technological objects that invade our daily life belong to the category of *artificial objects.* Artificial must be understood in its original sense :  
 .../...

(\*) For the terminology of systems analysis, see GEORGE J. KLIR, editor : *Trends in General Systems Theory* - Wiley Intersciences - N.Y. - 1972 - 462 p.

(\*\*) L. ZADEH and E. POLAK, editors : *System Theory* - Mc Graw Hill - N.Y. - 1969.

*designed by art* (\*), by human industry. Designers of such systems master all their conception and realization details, these are naturally systems.

Objects where human organizations play a certain role are only partly artificial. To study these socio-technological objects we must first *design a model for which is a system designed in such a way that it exhibits the same behaviour as the object* being modelized when they are both stimulated in the same way from the environment. The equivalence between a system and its model can never be total ; it is biased by *the specific viewpoint selected for the analysis*. This is a very important point and must never be forgotten. There can never be total exhaustivity in a model, except in the absolute world of metaphysicians.

We have to write *scenarios* of the system being studied in order to describe its temporal evolution. Each scenario is not the panorama of a forecasted or predicted future, but rather *the description of the path to follow* to proceed toward some desired direction with *an indication of the sequences of actions* that must be undertaken and *the evaluation of the probable consequences* and even the second-order consequences. It is mandatory to write a *set of alternative scenarios* to outline the broadest possible panorama of the possible futures. The constraints of available resources (men, time, money) generally limit this to a few scenarios : the most probable (which presents itself often unacceptable (\*\*)) plus a few *contrasted scenarios* where this or that point is purposely exaggerated in order to better study its influence, taking into account the multiple interactions within the system under study.

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(\*) HERBERT W. SIMON : *The Sciences of the Artificial* - M.I.T. Press - 1969 - 123 p.

(\*\*) This is the title of a DATAR study : *Une Image de la France 2000, scénario de l'inacceptable* - Collection Travaux de Prospective N° 20 - La Documentation Française - PARIS.



Modelling socio-technological objects is more difficult than that of artificial technological objects, in particular because they bring into play human organizations. System definition given above being always valid, the analysis process is conducted on two levels : *characterizing the elements and searching on their mutual interactions.*

Each system element can be described with the aid of a characteristic vector each component of being associated (\*) with :

- a qualitative definition of the existence of the component,
- a quantitative modality allocation selected from a set of possibilities.

An element is not defined in itself but in relation to other system elements. The existential definitions are relative and not defined a priori but by observing existing system states. The same for modalities. These latter are sometimes expressed by a numerical quantitative measurement. But it can so happen that other modalities show themselves to be more difficult to numerate. Some are almost uniquely qualitative. However, all these elements are important and *nothing has to be eliminated under the pretext that it would not be quantifiable.*

Mutual interactions between elements are analyzed according to a similar two level process. Firstly, *the proximity between elements* (we then speak of topology) and this analysis only concerns the essential definitions of elements components. We can go further by estimating the correspondence existing between the modalities of two or sometimes several elements that interact together, defining between these modalities logical and/or algebraic functions (order or measure).

.../...

We should not believe that it would be impossible to objectively study system evolutions unless we can accurately define the elements existences, their associated modalities and all their topological, algebraic or logical interaction functions. Between a too rigid theory (\*) - so rigid that it removes almost all the relevance from the model by forcing it onto the computerized Procrustean bed - and a rather vague speculation there is vast room for more or less formal models which are useful aids when writing alternative scenarios.

## 2 - TOPOLOGICAL STRUCTURAL SYSTEM ANALYSIS

In this way, it is realistic to limit the characterization of the interactions to the topological level hence the name topological structural analysis.

Many kinds of interactions may exist between two elements A and B where the influence goes from A to B, such as (\*\*):

- *direct causality* : a modification of A will naturally produce a modification of B,
- *decisional action* : a variation decided upon A should produce a wanted variation of B,
- *constraint* : the modification of B can only occur for certain required conditions of A (such as a certain modality or threshold overstepping).

.../...

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(\*) Such as dynamic modelling, used for the Five Years French Planning (Dynamic Model called "FIFI", for : Financial-Physical ; see the INSEE papers on that subject).

(\*\*) J. WANTY et J. FEDERWISCA : *Modèles globaux d'économie d'entreprise* - Paris - 1970 - 543 p.

It is useful to distinguish two variants of decisional action :

- *upstream decisional action* : the action decided via A involves a modification of B provided that the decision-maker gives his agreement,
- *downstream decisional action* : the action decided via A involves a modification of B provided the person about whom the decision has been taken gives his agreement.

Such a distinction allows for the introduction into the model of the notion of multiple decision centers with sometimes conflicting interests (\*).

After defining the set A, B, C, ..., E, ..., N of characteristic elements of the socio-technological object under study (the practical procedure will be explained further on, at this point we shall only mention that the elements retained to characterize the model of the studied object must have similar weight, lest the description should lack in coherence) , the question is asked for each : *does it, or does it not influence A, B, ..., N ?* And if it does, *what is the type of interaction* : direct causality, etc.

It is admitted that there will be only one answer : two different influences cannot exist in the same direction between interacting elements. For this *the characteristic vector of each element will be reduced to a single component*. If the subsequent analysis will show effects of this kind, it will be because one of these linked elements - or both - has been badly defined and that its characteristic vector still has two or several components and there is the need to separate that element into two or more elements.

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(\*) Private communication of J. MICHEL - Ministère de l'Équipement et du Logement - (France).

It is also admitted, and this is *an important working hypothesis for structural analysis*, that *interactions occur only in pairs*. If A and B influence C, A influences C and B influences C, both separately. This comes down to a linearization of the model. This hypothesis is valid only when the variations of the element of the model remain small. One must of course be very careful if, later in the study, the results obtained for small signals are to be extended to important modifications of the elements ; the possibility of removing the restriction admitted here will be described later.

All of the preceding interaction data allow for the elaboration of a square matrix which will constitute the model of the studied object. As an example case, figure 1 shows part of the topological structural analysis matrix for a socio-technological object, which is the Cultural Communication (\*).

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(\*) In this case, we have retained twenty three parameters : 5 for the general environment (1 : GNP ; 2 : Evolution toward the post-industrial state ; 3 : Average educational level ; 4 : Income spread ; 5 : taxes), 8 for cultural environment (6 : leisure time ; 7 : leisure time spread ; 8 : access facilities ; 9 : cultural heterogeneity ; 10 : getting into communication average level ; 11 : organized receiver feedback ; 12 : legal censoring ; 13 : lobbies influences) and 10 for the communication itself (14 : active mass media activities ; 15 : passive mass media activities with receiver investment ; 16 : passive mass media activities without receiver investment ; 17 : traditional cultural activities ; 18 : group activities ; 19 : household cultural investment budget ; 20 : household cultural budget for day to day activities ; 21 : public cultural budget ; 22 : cultural industry ; 23 : cultural non-profit associations).

```

*****
* Acts → * 0 1 1 1 2 *
* upon   * 5 0 2 8 2 *
*****
*FISCAL 5* 0 0 0 0 M *
*CAP=EX10* 0 0 0 S 0 *
*CEMS=A12* 0 0 0 V 0 *
*GROUPE18* 0 C 0 0 C *
*INDUST22* 0 0 M 0 0 *
*****

```

Figure 1 - EXAMPLE OF AN INTERACTION MATRIX

Letters attributed to the various types of interaction are :

- C : Direct causality
- M : Upstream decisional action
- V : Downstream decisional action
- S : Constraint.

### 3 - DECISIONAL PATHWAYS IN A GRAPH

The purpose of modelling of an object for its prospective study is to define strategies and policies. Therefore, the problem consists in using the above matrix to assist in the dialectical search of a decisional actions (be it upstream or downstream) pattern, i.e. a set of decisional interactions which must be established in order to reach the aimed for goals in the best possible way, taking into account the secondary reactions which occur between elements throught all the other interactions. In doing so, we find of course policies which traditional experience have empirically retained as being satisfactory. But some patterns diverge, and sometimes considerably, from tradition : their discovery justify the work of structural analysis.

Decisional interactions taken into account in such patterns act as direct causality interactions. Let us admit, as a first approximation, that constraint interactions may also be assimilated to causalities (we shall see further on how to differentiate this). The model of the studied object takes the form of a graph. The elements are the nodes of the graph, the arrows joining these nodes one by one describe the interactions. As there is no double influence, this graph is not a general "multigraph". Furthermore, an element does of course not influence itself : no arrow closes down on itself, and therefore the graphs under consideration in structural topological analysis are *directed graphs* (\*).

It is often possible to go a little further in order to refine the modelization. Expert opinions and known data often permit defining the sign of interaction. When A grows, does B grow ? or does it decrease ? We can go further and estimate whether the interaction is strong or weak. A strong interaction means an elasticity of about 1 between elements. In practice we put in the matrix boxes relative values on a scale of from 0 to 9 according to expert opinion (\*\*), the elasticity value of 1 corresponding for example to 7. The constraint interconnections are more difficult to reduce to a single numerical value, although it is always possible to call them strong or weak, even though these adjectives cannot be interpreted as being elasticities ; such a qualitative scale (strong, weak) can be transcribed into numerical values following the somewhat arbitrary correspondence : very strong, 9 ; strong, 7 ; medium, 5 to 3 ; weak, 2 or 1.

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(\*) For their theory : H. HARARY, R.Z. NORMAN and D. CARTWRIGHT : *Structural Models : An Introduction to the Theory of Directed Graphs* - New York - 1965.

(\*\*) Limiting to figure 9 permits easy printing, as shown on figure 2.

The graph corresponding to an interaction matrix thus defined in sign and value is a *fuzzy graph* (\*) the complete theory of which remains to be established. Replacing by 1 the interaction values superior or equal to a certain level (7, for instance) and the others by 0, we revert to a *signed digraph* (\*\*) of known theory. As we do not generally know how to specify the degrees of interactions in absolute value, it is interesting and even indispensable to have the threshold very in order to study the associated sensitivity effects.

As an example, the numerical fuzzy matrix of the graph of the Cultural Communication mentioned above is given figure 2.

```

*****
acts upon → * 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 2 2 2 2*
              * 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3*
*****
*PeNB 1* 0 7 0 0 5 0 0 0 0 0 0 0 0 0 0 0 0 9 8 7 0 0*
*POSTI 2* 7 0 8 0 0 4 6 0 6 0 0 0 0 0 0 0 0 0 0 0 0 0*
*MEDUC 3* 0 8 0 3 0 0 6 0 6 6 4 3 3 8 5 5 4 8 0 0 0 0*
*DISP.R 4* 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 9 7 0 0 0*
*FISCAL 5* 0 0 0 5 0 0 0 0 0 0 0 0 0 0 0 0 0 4 3 0 4 0*
*TDISP 6* 0 0 0 0 0 0 4 0 0 0 0 0 0 4 7 7 5 5 0 0 0 5*
*EMIT 7* 0 0 0 0 0 0 0 0 0 0 0 0 0 7 0 0 6 8 0 0 0 0*
*ACCES 8* 0 0 0 0 0 0 0 0 0 0 0 0 0 4 7 7 8 7 0 0 0 0*
*METEC 9* 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 7 0 0 0 0*
*CAPEX10* 0 0 0 0 0 0 0 0 0 0 3 0 0 8 0 0 0 7 0 0 0 0*
*FEEDB11* 0 0 0 0 0 0 0 0 0 0 0 2 2 0 0 0 0 0 0 0 0 0*
*CENSA12* 0 0 0 0 0 0 0 0 0 0 3 0 0 0 1 1 1 7 0 0 1 0*
*CENSG13* 0 0 0 0 0 0 0 0 0 0 3 0 0 0 0 0 3 0 0 0 0 0*
*ACTIF 14* 0 0 0 0 0 0 0 9 7 0 0 0 0 3 3 2 7 0 0 0 2 5*
*PAS I15* 0 0 0 0 0 0 0 7 4 0 1 1 7 0 0 5 5 0 0 1 7 0*
*PAS SI16* 0 0 0 0 0 0 0 7 4 0 1 1 7 0 0 5 5 0 0 1 7 0*
*TRADIT17* 0 0 0 0 0 0 0 4 0 0 0 1 1 1 0 1 0 0 0 0 0 0*
*GRBUPE18* 0 0 0 0 0 0 0 9 9 0 0 0 7 3 3 1 0 0 0 0 1 7*
*IMEN 19* 0 0 0 0 0 0 0 0 0 0 0 0 3 7 0 0 0 0 0 0 7 0*
*FCMEN20* 0 0 0 0 0 0 0 0 0 0 0 0 5 0 7 2 5 0 0 0 7 0*
*BC.E 21* 0 0 0 0 0 0 6 0 0 0 0 4 7 7 7 7 7 0 0 0 6 7*
*INDUST22* 0 0 0 0 0 0 4 0 0 0 0 4 4 7 7 0 0 0 0 0 0 0*
*ASSOCI23* 0 0 0 0 0 0 0 0 0 4 1 0 7 0 0 3 7 0 0 0 0 0*
*****

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Figure 2 - EXAMPLE OF INTERACTION VALUES MATRIX

.../...

(\*) In the sens of L. ZADEH - See : *Toward a Theory of Fuzzy Sets* , in : *Aspects of Networks and System Theory*, editor R.E. Kalman - 1971 - p. 469, 490.

(\*\*) FRED S. ROBERTS : *Signed Digraphs and the growing demand for energy* - RAND R-756-NSF Report - May 1971 - 47 p.

The numerical scale of interaction values has been chosen between - 9 and + 9.

The accuracy of the analysis may be increased by defining interaction, not by a single coefficient, but by a *correspondence table* (\*) between the modalities of the two elements A and B mutually influencing one another.

When  $a_1, a_2, \dots, a_i$  and  $b_1, b_2, \dots, b_j$  are the main modalities associated with the elements A and B, A and B correspondence table sums up the liaisons as follows :

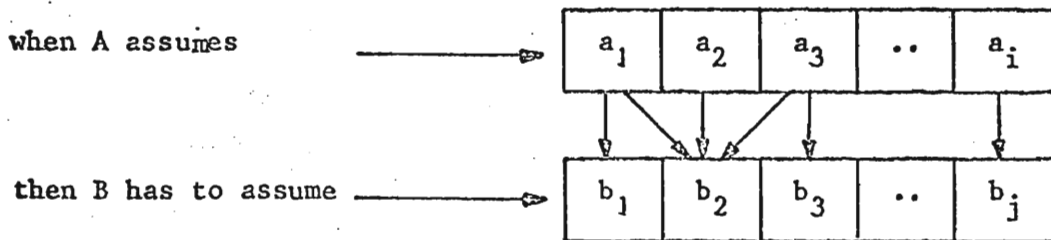


Figure 3 - CORRESPONDENCE TABLE

It is possible to generalize onto multidimensional correspondence tables, which will remove the simplification previously mentioned for interactions in pairs only. The additional dimension(s) may in fact be the modalities of one (or several) element(s) interacting in accordance with a constraint liaison.

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(\*) J. WANTY : *Schémas décisionnels* - Draft Report of Centre de Recherches Econométriques Appliquées - Université Paris Dauphine - 50, 21, 18, 27 p. See on this point chap. 2, p. 11 à 15.



#### 4 - LEVELLED GRAPH EQUIVALENT TO A GIVEN GRAPH

How can we use the two matrices (types of interaction and values of interaction) to define the actions to be carried out within the framework of a certain policy? The orientation of this policy (criteria of judgment and relative weighting of these criteria) clearly remains the responsibility of the decision-maker for whose benefit the study is being done. This policy should materialize into a certain number of results, hence of modifications in a given direction of values of elements called "goals" elements. This desired evolution is a result of modifications voluntarily brought to elements called "decisions" on which the decision-maker concerned does have the possibility to act. Very generally speaking, however, an isolated action is not sufficient and we have to look for a set of coherent modifications of several "decision" elements. This coherent set, this Plan, is the concrete translation of the aimed for policy orientation.

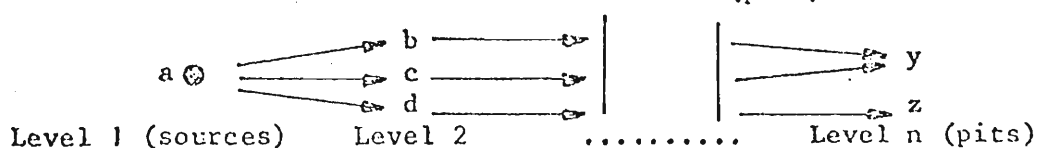
It is not at all a question of looking for an optimum in the sense of operational research. Such an ambition would be unreasonable at least for the following reason : how can we set a single criterion for what is optimal? On the contrary, we must define possible good solutions and dialectically seek more and more efficient plans. For this purpose, it is very useful to arrange the drawing of the graph so as to seek (\*) the nearest levelled graph (\*\*).

.../...

(\*) A study of the Housing System is being carried out thus by the "Plan Construction" (Housing Ministry, in France). See internal notes on the subject published by their "Secretariat". And also :

P.F. TENIERE-BUCHOT and J.J. OERLEMANS : *Le modèle "Popole", une tentative d'analyse du système "Eau" dans une agence financière de bassin* - Analyse et Prévision - February 1973 - p. 155, 232 and march 1973 - p. 255, 333 (see the pages 256, 265).

(\*\*) A levelled graph is a graph where the nodes are spread out onto a discrete (and low) number (n) of levels. The influences (sources) originate from level 1 and level n is where the influences arrive (pits).



The matrices enable first of all to define the "decision elements" and the "goals elements". Some columns on the matrices may be empty : no other element acts on the element under consideration, whereas the latter acts on the others. It is therefore a "source" element, which is either of environment or of decision (example : the budgets, parameters 19 and 21 of the table on figure 2). It may also be that all the boxes in a line may be empty : since the corresponding element does not act on any others, it is a "pit" element which is a goal. These ideal cases are very uncommon, but we can define elements which are more "source" (decision) and those which are more "pit" (goals). We can for this purpose use the ratio : number of arrows entering a node/number of arrows coming out of the same node. This ratio will be small for an "almost source" and large for an "almost pit".

After computing values of this ratio for all the elements, two inverse thresholds are defined for the classification of the elements into three categories : almost sources, almost pits and others. Such a representation (figure 4) is the starting point for a iterative computation of the levelled graph structure.

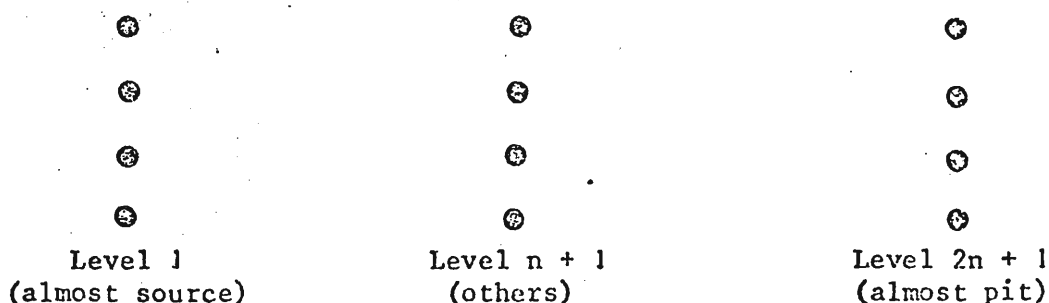


Figure 4 - STARTING POINT FOR LEVELLED GRAPH CALCULATION

To make the calculation easier, it is useful to use an odd number of levels (3, 5, 7, etc., 5 and 7 being preferable (\*)). We must then distri-

.../...

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(\*) Above 7, the complexity of hierarchy makes the help of the drawing rather inefficient ; three levels constitute a too large simplification of the graphic presentation of interactions.

bute the elements of these initial three groups between these 5 or 7 levels. The presence of short loops (length 2) complicates the problem. We can diminish their effect by correcting the incoming arrows outgoing/arrows ratio accordingly (\*).

At each iteration we compute for each node a shifting index (equal to + 1, 0, - 1) taking into account both the larger distances between this node and the neighboring levels nodes and the number of the initial level of this node (\*\*). The result for all nodes is the starting point for the next iteration. There is not necessarily a convergence towards a steady state but after a certain number of iterations the shifts are at the utmost of one level around a mean level. It is convenient to print the successive levelled graphs obtained during the iterations: this enables to make a final decision on the diagram adopted for the study of decisional pathways.

Group reflexion on the levelled graph already helps much in the qualitative search on policy definitions when examining what happens when such and such a decisional (upstream or downstream) liaison is or is not established.

## 5 - AUTOMATIZATION OF THE SEARCH FOR ACTIONS

We may want to go further and to make systematic search on the most efficient actions.

.../...

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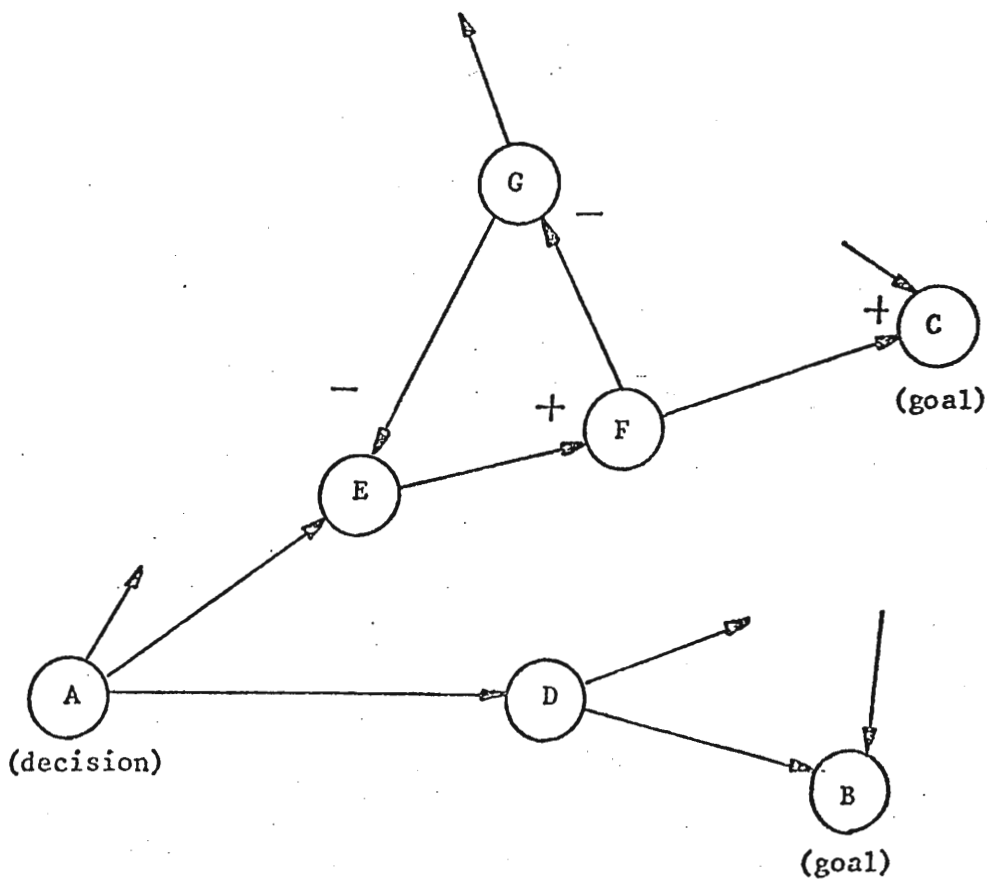
(\*) et (\*\*\*) J.M. GAMBRELLE : *Elaboration d'un graphe à niveaux voisin d'un graphe général donné* - TH/CSF Internal Report - DTG - 513/73 - April 1973 - 9 p.

The starting point is the following very general statement. With a system in evolution, it always happens that certain elements modify themselves quicker than others. The resulting differences produce tensions which in turn deteriorate the system internal coherence and /or disturb the links with its environment. Then interactions come into play to more or less re-establish the coherence because : *"In a general way any human society constitutes a homeostatic system which itself tends to cancel any local modification brought to its equilibrium"* (\*). This homeostasis appears very troublesome when we wish to act voluntarily. But we can put onto a useful way this homeostasis : *"a permanent transformation cannot voluntarily be impressed except by the triggering within the system of a self accelerating chain reaction which acts as a cumulative process bringing social forces into play"*(\*\*).

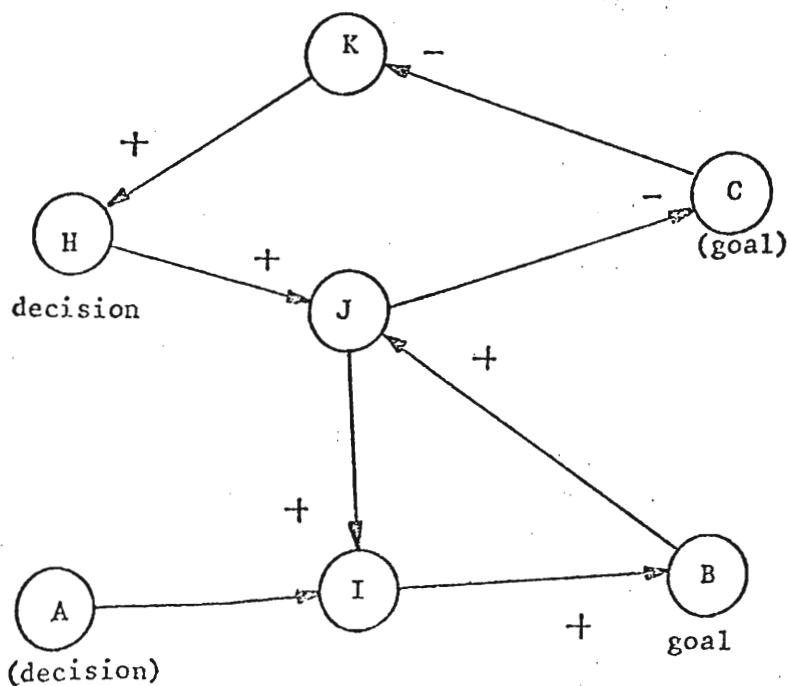
To seek out and define efficient policies (as in the present case for cultural communication in a society evolving toward post-industrial age but the method proposed here is absolutely general), we search the possibilities of cumulative processes within the system being studied. In other words we have first to discover closed loops between interacting elements, especially the loops which present a self-amplifying effect. Some of these loops links this or that goal element and this or that decision element either indirectly (figure 5, case 1) or sometimes even directly (figure 5, case 2) when goals and decisions are not strictly goals (because they react on other element) or not strictly decisions (because other elements act on). Acting via decisional elements relating to such self-amplifying loops, the result of the actions will be particularly efficient. Of course, here again it will

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(\*) and (\*\*) O. GELINIER : *L'Entreprise Créatrice* - Paris - 1972 - p. 23.



Case 1 : Action A; C via the amplifying loop (E, F, G) is more efficient than the simple action A, (D), B.



Case 2 : The loops may include goals or (and) decisions

Figure 5 - SELFAMPLIFYING DECISIONAL PATHWAYS

be necessary to work in group on the loops to dialectically reach the definition of the coherent set of action (activation of decisional arrows and action on corresponding decisional elements).

The self-amplifying effect takes place when *the product of the elasticities along the loop is equal or superior to + 1*. If we open up a loop at any one  $A$  of its nodes to enter into it an increase  $\Delta A$ , the chain of interactions in the system sends back  $f(\Delta a)$  (figure 6). When

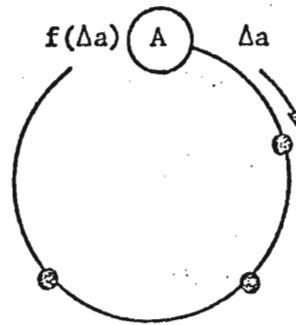


Figure 6 - GAIN IN A LOOP

$f(\Delta a) > \Delta a$  (loop gain  $> 1$ ) there is a kind of exponential runover (figure 7). Intuitive search of self-amplifying loops is not easy, since it happens that

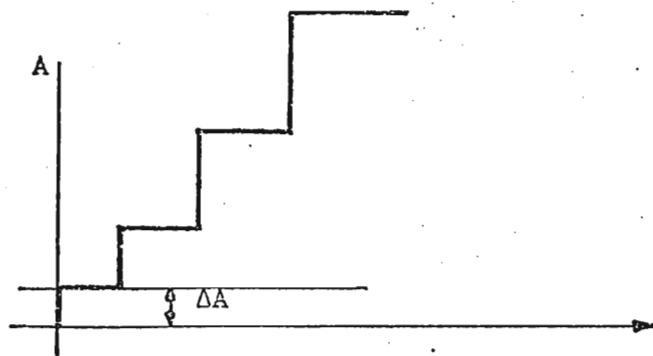


Figure 7 - SELFAMPLIFYING LOOP

the self-amplification results from a combination of accelerating and inhi-

biting influences in even number. This kind of loop is not evident. Professor Jay FORRESTER speaks in of *counter-intuitive behavior of social systems*(<sup>\*</sup>).

When loop gain is between  $-1$  and  $+1$ , there is a return to steady state with or without oscillations (according the sign negative or positive, of the gain).

The loops for which the produce of elasticities is above 1 but negative must be examined although it brings no real action possibilities : self-amplification induces growing oscillations (whose amplitude will be limited by the non-linear effects which always exist in real world systems). Thus action via such a loop risks introducing troublesome cyclic effects (figure 8).

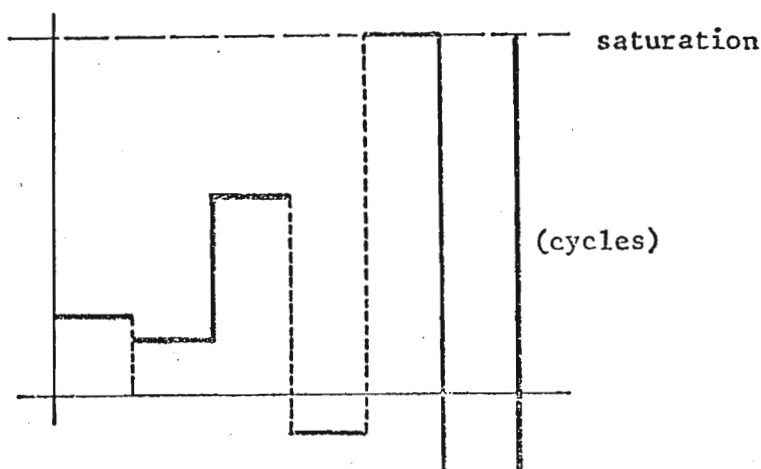


Figure 8 - CYCLIC EFFECTS IN A  
SELFAMPLIFYING NEGATIVE LOOP.

In order to find the self-amplifying loops (including the self-oscillating ones) the interaction matrices are used in the following manner :

.../...

(<sup>\*</sup>) *Counter intuitive Behavior of Social Systems - Simulation (U.S.A.) - February 1971 - p. 61, 76.*

we decide first of decisional arrows to be activated and we take into account the corresponding interaction values. We take also into account all causality and constraint arrows. To do so, we put zeros in the boxes of the main diagonal and + 1 and - 1 in the boxes where the interaction is strong, positive or negative respectively, the "strong" threshold being, as said above, selected at a value of the scale 0 - 9. We then square in a booleean fashion the matrix. Figures 1 appearing in boxes of the main diagonal indicate that there is a two fold loop via this element.

We then multiplie the previous result by the initial matrix to find the length 3 loops with the same procedure, and so forth.

We must avoid considering that two loops intersecting in one point are forming one long loop. For this purpose, after each multiplication we automatically turn all the boxes of the main diagonal back to zero (\*). When there is a large number of loops of one given degree we must separate them and try to find the associated elements within each loop. This becomes more complicated if the same element is included in several loops. Programs written at THOMSON/CSF by J.M. GAMBRELLE (\*\*\*) solve these difficulties.

Figure 9 shows how the results appear : printing of the  $\pm 1$  matrix and printing of loops list with indication of their + or - sign. The loops are printed by increasing lengths and for each length by increasing element numbers which makes subsequent exploitation much easier.

The set of loops of degrees 2, 3, ... define a certain connexity within the graph. We might of course work directly on the "fuzzy" graph and not on the digraph. It would then be necessary to generalize the notions

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(\*) and (\*\*\*) D. BENEDIC and J.M. GAMBRELLE : *Analyse Structurelle de Systèmes - Diplôme d'Economie de la Recherche et du Développement* ) INSTN, Saclay (France) October 1972.



* COL	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2		
* 19507	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	
* P.N.B	1*	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
* POST-I	2*	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* Y. EDUC	3*	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
* DISP.R	4*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
* FISCAL	5*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* T. DISP	6*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
* EMI.Y	7*	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
* ACCES	8*	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0
* HETE.C	9*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
* CAP.EX10*	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
* FEED.B11*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CENS.A12*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
* CENS.G13*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* ACTIF	14*	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
* PAS. I15*	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
* PAS. SI16*	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
* TRADIT17*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* GROUPE18*	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1
* I. MEN	19*	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
* FC. MEN	20*	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
* B. C. E	21*	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1	0
* INDUST	22*	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
* ASSOC	23*	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0

LONGUEUR DES CIRCUITS 2

- SIGNE DU CIRCUIT \* 1++ 2++ 1
- SIGNE DU CIRCUIT \* 2++ 3++ 2
- SIGNE DU CIRCUIT \* 9++18++ 9
- SIGNE DU CIRCUIT \* 10++14++10
- SIGNE DU CIRCUIT \* 10++18++10
- SIGNE DU CIRCUIT \* 14++18++14
- SIGNE DU CIRCUIT \* 15++22++15
- SIGNE DU CIRCUIT \* 16++22++16
- SIGNE DU CIRCUIT \* 18++23++18

LONGUEUR DES CIRCUITS 3

- SIGNE DU CIRCUIT \* 9++18++14++ 9
- SIGNE DU CIRCUIT \* 10++14++18++10
- SIGNE DU CIRCUIT \* 10++18++14++10
- SIGNE DU CIRCUIT \* 14++18++23++14

LONGUEUR DES CIRCUITS 4

- SIGNE DU CIRCUIT \* 9++18++10++14++ 9
- SIGNE DU CIRCUIT \* 9++18++23++14++ 9
- SIGNE DU CIRCUIT \* 10++18++23++14++10

Figure 9 - EXAMPLE OF THE PRESENTATION OF A LOOP LIST

(table page 10 with limit at 7)

of path and loop in a graph and replace in the squaring successive processes the booleean operation by minimum of (\*) operation.

The loops discovered through this automatized search should then be interpreted : when they consist in causality liaisons and/or in decisional actions, they are genuine loops. But when they include constraint interactions, they may in fact be false-loops, since the constraints do not allow the establishment of a genuine cumulative process (\*\*).

Once the actions to be taken are qualitatively defined, it is necessary to examine the possible second-order effects via the side interactions. The existence of overlapping loops is going to complicate this study. In the very simple case where one node only is implicated in two loops, we can average between the two amplification coefficients (going back to the true values of interactions). This is no longer possible when several loops overlap. Then the only solution would be to compute the temporal evolutions of the parameters by correcting the foreseeable evolution that they would have

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(\*) L. ZADEH - study quoted above.

(\*\*) See on this subject : J. WAITY : *Schémas décisionnels* - Draft Report of Centre de Recherches Econométriques Appliquées - Université Paris Dauphine - 53, 21, 18, 27 p. The last chapter is devoted particularly to the structure of loops according to the various types of interactions.

had if they were isolated using a set of linear equations (\*). But by doing this we fall back into the classic dynamic modeling and all its difficulties.

Remaining at the topological level, we can first of all consider only short range interactions something that greatly reduces loops number. Then we study which are *the directions favourable or unfavourable of long range interactions effects.*

We must understand that this kind of study has no pretention to accurately describe a predicted future. It only shows the sensitivities of direct consequences to actions and the directions of second-order consequences which can reveal themselves to be undesirable. This is exactly what we want to outline "alternative futures".

## 6 - HOW TO PROCEED IN PRACTICE

Structurization of a complex sociotechnological object remains difficult and there is no exact rule guiding the steps to follow to determine the elements of a topological structural analysis model. To a given socio-technological object, analysis can design a lot of possible systems without being possible to assess that some model is better than another.

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(\*) In the simple case of elements having a variation from 0 to 1 according to a logistic curve, computation is easy. See JULIUS KANE : *A Primer for a New Cross-Impact Language : KSIM - Technological Forecasting and Social Change - 1972 (Vol. 4) - N° 2 - p. 129, 142.* and : *Environmental Simulation and Policy Formulation - Methodology and Example (Water Policy for British Columbia) - International Symposium on Modelling Techniques in Water Resources Systems - 10, 12 May 1972 - Proceedings (Vol. 1) - p. 39, 55 - Edit. K. Biswas - Environment - Canada - Ottawa.*  
See also the studies of K. CRAVER (Monsanto Company Ltd. - St Louis - U.S.A.), personal communication about *Dynamic Cross-Impact*. This last model is available from T. GORDON (The Futures Group - Glastonbury - U.S.A.).

The first thing to do is to well define the general analysis viewpoints since we can never be entirely exhaustive.

Then comes the determination of elements, which can only be done in a valid manner if the analysis takes into account a set of different points of view : this is the reason why it is necessary to call upon an adequate number of experts (\*) in various fields, in order to attain the multi-disciplinary character sought. A small (4 to 5 people) permanent group ensures the general coherence in all this work.

The determination of the elements is undertaken in the following manner : the permanent group sketches a temporary structuration in broad outlines. This latter is used as a basis for a larger inquiry undertaken with outside experts. These are invited to define the elements which to them appear to be important in the structuration of the object under study, either by written questioning or preferably during personal interviews. The permanent group draws the synthesis of these data and elaborate a draft list of elements for the model. Subsequent steps (always by written questioning or direct interviews) enable the experts to give their opinion and finally to specify, each within his own field of competence, the interactions (\*\*) (type and value) which in his view exist. It would in fact be useless and even dangerous for the relevance of the replies to ask everybody's opinion on all the interactions. The permanent group draws the synthesis of all these replies, which enables it to elaborate box by box the matrices.

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(\*) F.S. ROBERTS : *Building an Energy Demand Signed Digraph I : Choosing the nodes* - RAND R-927/1-NSF Report - April 1972 - 93 p.

(\*\*) F.S. ROBERTS : *Building an Energy Demand Signed Digraph II : Choosing Edges and Signs and Calculating Stability* - RAND R-927/2-NSF Report - May 1972 - 66 p.

All this work of course takes time, but it is essential : *the definitions of actions will be worth that the structural data (list of elements, mutual interactions in type and value) are worth.* It of course becomes necessary at this stage *to take into account all the foreseeable decisional elements* : if some were neglected or forgotten, they could not be reintroduced later and the defined policies would lack of completeness.

As we have already said - and we insist upon this point - the elements retained for the model must be of similar weight. How many elements should we retain ? If the number is too small (10 for example) the description is too simplified and the corresponding scenario will lack of relevance. But if the number is too big (100 for example) the quantity of interactions to consider is so high (it increases as  $n^2 - n$ ) that the time required will go beyond reasonable limits. An adequate compromise lies between 40 and 70 elements.

Of course, at the first definition, the experts will give many more : 100 to 200 for example. The permanent group should take the responsibility for the melting down into one of similar elements, and even for deleting those which would seem unimportant.

*A written definition is associated with each element* : this is mandatory in order to ensure language coherence between those who are working to the study. Study on the interactions of an element X on another element Y often permits an improved definition of X and/or Y. A difficulty to point out : *the interaction of element A on another element B must be direct.* Too often we have a tendency to say that A interacts on B because we have

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thought of an intermediate C which influences B and which is influenced by A. We must absolutely avoid this trap which would remove all relevance from the interaction matrix and therefore from search for loops. As the work proceeds, it will permit step by step the elaboration of a report associated with each element retained for defining the structural matrix. Quantitative and qualitative data which characterized each element are put on this report.

The synthesis of the study is thus elaborated little by little.

Structural analysis of a sociotechnological object is in itself a valuable exercise because it obliges us to accurately define the problem under study without leaving any point in the dark. Also, it is an excellent instrument for communicating between experts and decision-makers.

The presence of the latter<sup>s</sup> proves indispensable at all stages of the study : definition of the elements, estimation of the interactions, search for efficient action strategies by the study of positive self-amplifying loops.

Structural analysis only permits reasoning within a fixed structure of the object under study. We cannot hope to find major innovations because these correspond to structural changes. But nothing prevents asking the question : what would happen if we were to free ourselves from such existing causality interaction or introduce such new decisional interaction until then not considered, using as an aid the list of loops recomputed for each new case. The field so open is large. We can explore it by adopting as an example the following heuristic rule : past experience shows that the links within sub-systems are very solid but the links between sub-systems are more fragile. Therefore, we could try to modify these latter links (between sub-systems) to creatively define new policies which show themselves realistic and innovative.

## TOWARD A TECHNOLOGY OF VALUES ^

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## INTRODUCTION

As Maruyama (1970) and others have pointed out, epistemological or logical "resonance" is required before assessment/prediction/implementation of cultural phenomena becomes consensual. There is much resonance of this sort in the human values literature, a condition which should suggest essentially homogeneous rather than pluralistic values assessment/prediction/implementation.

How many values polling exercises have been conducted with the poor and the non-Caucasian and then reported in the futures literature? How many "experts" in ghetto or Third World living have participated in IFF or RAND Delphi exercises oriented to the future of human or even American values? How many American Indians? Asian Americans? Women? None that I can find in

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^ This paper is derived from a longer one commissioned in mid-1972 by the Office of the Secretary, U.S.H.E.W., and administered through Georgetown University.

the literature. Thus, using Maruyama's language, a major fault with the current "official" values literature is monopolarization--epistemological or logical lock-in leading to quite homogenous values assessment/predictions/implementations.

Maruyama is correct when he asserts that epistemological lock-ins decrease the likelihood that new types of resonance will develop among people. The versatility of systems is related to their degree of "openness," or their capacities to interface with new information at many levels. Some of the "best" of the reporters on values assessment/prediction/implementation understand this clearly (Wilson, 1971). The deceased American entertainer W.C. Fields was noted for his understanding that "style" is at the core of many human judgments and behavior. Ian Wilson, among the many who have courageously undertaken future values research, recognizes this. So does Harold Shane, who recently offered his own excellent distillation of contemporary American/world difficulties, all of which have direct and indirect implications for future values assessment/prediction/implementation (Shane 1972). Graham Molitor (1972) recently has proposed world-scale value changes associated with the persistent decline of "traditional industrial pursuits," adding to a chorus of indications pointing this direction (Abrams, 1971; Baier and Rescher, 1969; Beckwith, 1967, 1972; Beer, 1970; Bell, 1968; Bennis, 1968; Boulding, 1964; Boguslaw, 1965; Brameld, 1965; Breed, 1971; Brickman, 1969; Burhoe, 1971; Chardin, 1969; Clarke, 1953; Dechert, 1966; Delany, 1971; DeNike, 1972; Drucker, 1969; Esfandiary, 1970; Feinberg, 1969; Fuller, 1970; Gabor, 1970; Goodman, 1960; Gross, 1966, 1969; Hampden-Turner, 1970; Hardin, 1972; Harman, 1970, 1972; Henry, 1963; Huber, 1972; Kahn, 1972; Kavolis, 1970; Markley, 1970; Maruyama, 1972; McHale, 1969; Meadows, 1972; Michael, 1968, 1970; Reich, 1970; Reiser, 1966; Rescher, 1967; Revel, 1971; Roszak, 1969; Sennett, 1970; Skinner, 1971;



Smith, 1971; Theobald, 1968; Toffler, 1970; Vickers, 1968; Wager, 1971; Wiener, 1972). Vytautas Kavolis offers perhaps the best single summary of the epistemological tensions which he believes are facing "post-modern" man (Vytautas, 1970):

Rationality versus expressive spontaneity--the "increasingly rationalized and impersonal bureaucracy" may result in "a more rationally organized" personality or, in reaction against this, "an exaggeratedly irrational kind of personality...inclined toward anarchic romanticism, expressionsim, mysticism..."

Separation or inner fragmentation versus "apocalyptic" or "orgiastic" fusion--the first in response to the increasing differentiation of functions within the modern social structure and the second in reaction against it.

Hierarchy of control versus equalitarianism of control--resulting from the "increasing centralization of impersonal social control."

Standardized repetitiveness versus the need to reassert individual and group uniqueness--as a result of the development of the "mass society" (a populous society sustained by mass production and with aspirations for universal participation in political and cultural decision-making).

Consumption orientation versus the sense of an inner void--as a result of affluence.

Technological mastery versus social, emotional, metaphysical impotence--as a result of technological growth.

Knowledge of the principles of operating systems versus sensuous experience of concrete details--as a result of scientific advances and the accumulation of scientific knowledge.

Immediate satisfaction and constant experimentation versus the sense of "not getting anywhere" and the desire to recover "the primeval"--as a result of accelerated social and technological change and increased mobility.

Interdependence of parts and the explication of ambiguities versus incomprehensibility of the whole and the dream of simplification--as a result of increasing sociocultural complexity.

Vivid imagery and impermanence versus a sense of numbness and the need for unshakable points of reference--as a result of the volume of messages transmitted by the electronic mass media.

While much of the preceding literature is exciting -(Vytautas' analysis, in my opinion, is excellent) there is still something missing. I believe Ian Wilson's rather abstract value forecasts are in general agreement with many recent studies generated here and in certain other industrial/post-industrial countries. I think Shane's highly inclusive categories of value and behavior mesh neatly with those of Vytautas and Molitor; indeed, they were chosen partly with this in mind. But what of the "tragedy of the commons?"

(Hardin 1972) Why will it probably continue to be so vexatious in light of all that we "know" about the state of the present, or past, and some of the "most likely" futures? The problem it seems, is not so much that we cannot predict values; it is that we cannot control them. But, let us think of control in terms of control over opportunities rather than problems. Intellectuals often seem intent on winning their stripes through pointing out why new things cannot work rather than why they might. This is very often the case where intellectuals are confronted with the possible development of beneficial changes rather than disbeneficial ones. It is difficult to say where the self-fulfilling prophecies of intellectuals will produce widely influential results of any particular kind, but we know something about the dynamics of essentially ideological prophecies and slogans in the worlds of government, business, the family, education, and the military.

To be certain of future value profiles requires an excellent understanding of--and control over--the critical variables, and any feedback resulting from their manipulation (including the results of such manipulation on the manipulator). Even though this is the case in both the "real" and the "research" worlds, intellectuals are inclined to forget sometimes that the two worlds are the same. Successful businessmen and quality government officials don't make this error. To them, "futura" are as important as "facta" (indeed,

they are more important, because to these men, tomorrow is what today is all about).

To gain control over the epistemologies (or models) and model elements (or values) that structure human behavior is not to submit meekly to vulgar "conditioning" by "Them;" it is to recognize and exploit the possibilities for anticipatory values assessment/prediction/implementation in iterative, open-loop information environments. We must recognize that many of the shifts in values and human behavior now apparent to us may be the precursors of such future environments. Style will be of the utmost importance in making provisions for greater participation by low status humans in the anticipatory control of the models and environments that shape their life choices and chances. It is simply not true that "all of us want the same things deep down (e.g., 'food')," any more than it is true that all humans "speak the same basic language (e.g., through species 'empathy')." These generalizations will probably hurt us more in the future than before unless we recognize that diversity in the particular models and life styles of individuals and groups has been at the core of so much human opportunity. There are those who would wish to reduce heterogeneity vastly in order to eliminate the likelihood of "conflict." Skinner has been accused of this intent. Yet, even the garden variety cultural anthropologist would recognize in Skinnerian thought most of the dynamics of human culture building and maintenance--excluding style. "Style" is thus a way of referring to subtle, largely uncontrolled, idiosyncratic change potentials at any level of structure/process in any type of human system. Style refers both to "design" and "trans-experiential" change--inducing potentials (Jantsch, 1972; Sennett, 1970). Style is the source of "eolithic" or supralogical, unplanned change potential, the source of "progress". Progress is defined as an increase in the numbers and types of alternative epistemologies or models available for choice (Reiser, 1966).

Elsewhere, we have written about "knowing humanism", or an active, exploratory, process- and information-oriented type of humanism which cuts across "both local and cosmocentric levels [of humanism], acting to informatively link many types of culture; energy, and other components into evolving information loops" (Harkins, 1971). We went on to say that the loops "may be tapped voluntarily by any type of culture;" that "no information is secret; all process skills are open to examination; no epistemological lock-in characterizes either style or content." We said that "knowing humanism" is distinguished from contemporary science by its flexibility, openness, full respect for different world views or epistemologies, and for its aggressive provision of two-way terminals with different cultures and subcultures. It is this active approach to the design and redesign of multi-looped systems that excludes fewer and fewer cultures and persons that characterizes the spirit of interdisciplinary activities on campuses, the "open files" provisions in the conduct of certain government community action programs, and other private and public sector examples of loosening controls over information. Fields Within Fields, a relatively new journal born from the work of Julius Stulman, Oliver Reiser and others converts the principles of a cybernetic, interactive, and multi-epistemological world-wide culture of man into even more explicit operating principles and proposals for implementation. Several years ago Julius Stulman of Fields Within Fields proposed certain fundamental criteria for any design or redesign activities focused on any human institution (Stulman, 1968). In many ways, Stulman's proposed changes sum up the major opportunities for mankind in the remaining decades of the century and thus act as values within an encompassing epistemology or model. The vigorous and humanly responsible character of Stulman's provisions seem paradigmatically far more useful to contemporary man than the arid positivism and over-concern with cautious prediction characteristic

of so much social science and related research; or the negative scare scenarios of "future schlock." Stulman's approach shows both style and open-ended approaches to purposiveness within design and post-experiential frameworks. It enables the development of power.

For any human system, "power" may be defined as the development, maintenance, and utilization of wide-ranging functional alternative within any particular set (or sets) of constraints. A key element in this definition of power becomes the ability to exercise concrete choices that are intimately related to the range of imaged armchair alternatives. In order to prevent this process from becoming uncontrolled, ingrown or potentially harmful to any human system, open information provisions are required. Any internal or external interest theoretically may attempt to constrain any practical exercise of "power" as I have defined it here. Open planning and feedback processes will, I believe, constrain the overzealous, particularly where "empire-building" or bureaucratic nucleation are involved.

#### General Assumptions

One of the most concise and useful treatments of the constraints involved in futures research was developed by staff members of the Institute for the Future (Enzer, et. al., 1971). It seemed to me that the manner in which these generalizations were stated was attractive for several reasons, so I have attempted to emulate the format in the following paper. These pages show you what I believe to be the essentially correct (and perhaps personally desirable) analysis provided by Vaytautis in previous pages, upon Maruyama's, Stulman's, and Jantsch's work, and upon that of numerous others concerned with the nature and effects of human values. (Bauer, 1966; Bennett, 1964; Bronowski, 1965; Dewan, 1969; Forrester, 1971; Fuller, 1970; Gabor, 1965; Good, 1970; Harkins, 1972; Helmer, 1966; Hetman, 1969; Ikle', 1971; Jantsch, 1972; Joseph, 1971;

Jouvenel, 1967; Kuhn, 1962; Jaoui, 1970; Mead, 1970; Moles, 1970; Platt, 1970, 1971; Polak, 1971; Rescher, 1969; Rogers, 1962; Sandow, 1971; Tart, 1972; Von Foerster, 1968; Wiener, 1954, 1970; Williams, 1960; Youngblood, 1970).

- Prediction of values is difficult to the extent that (1) "theory" is inadequate (wrong epistemology), (2) change is rapid, (3) terminology is confusing and vague, (4) "instruments" are underdeveloped, (5) and data access is uneven or nonexistent.

- Prediction of values is easier when human behavior generates correct "theory" (right epistemology) through feedback, and is reinforced itself by such "theory" (symbiotic regenerative loop relationship). What "everybody knows" is culture, generated and maintained in this way. It works well as long as "everybody" is satisfied, and there are no other groups of "everybodies" who might enjoy different symbiotic regenerative loop relationships between behavior and "theory."

- In one sense, values are abstract validators of past, present, and planned culture on many levels--civilizational, national, sub-cultural, personal, intrapersonal. In another sense, values are parameters in human working models of the world--set through physiology and through general and unique cultural "programming" experiences at many levels. In another sense, values are valences (+ or -).

- Sophisticated systems employ all three definitions of value--and perhaps others. "Futura", or "future facts" (de Jouvenel 1967) are in some ways parameter-setting images of proposed reality. They are valenced. They are validating. "Facta", or "present and past facts," perform similarly through other images of realities.

- "Facts" and "futura" co-exist in all time frames. It is convenient to separate them to gain knowledge of model frame works and other features of

the time/space environment. Thus, "future shock" is the venerable "culture shock" dressed up to enhance the sense that one man's future is another's past--including whatever validations and valences are attached to each reality.

- Realities co-exist in space and time as facta and futura. Poor people "know" this; so do third worlders, the ambitious and the fatalistic. Facta and futura, once generated by any means, are "real." Absence of full participation in the environment leads to limited knowledge of facta and futura, hence to inadequate "theory."

- "Theory" is a convenient label for model assessment. Verstehen is another, and "dig" and "vibes." Cultures are "seen" through different models generating different facta and futura, which become part of the evolving programming environment.

- Cultures are purposing cybernetic systems that program (control) behavior through information. Sometimes programming is more closely linked to physical ("hardware") environmental features, sometimes to "software" environmental features. Sometimes cultures are partially programmed by "mass" participation (primitive band, some industrial democracies) and sometimes in more restricted ways.

- All cultures are reprogrammable. While participatory (anticipatory) democracy is still under development, more people freed from drudgery now "join" the traditional elites. The formerly poor have more time to think and to involve themselves widely. In the U. S., pluralism is beginning to mean more cultural differences generated by more people feeding back into less and less adequate models. New models are being generated. The U. S. is becoming an "experimenting" or "self-directing" society. Bureaucratic organizations, which have performed daily experiments on humans for decades, now find themselves being experimented with on many sides.

• Cultures are information systems with comparatively greater or lesser automation in particular institutions. People or other systems may be viewed in a similar way. To progress (become more complex and "survival fit" through provision of alternative models among which to choose), cultures and other systems must automate and deautomate functions within flexible meta-models. Flexible meta-models (scientific "theory," myths, "supernatural thought," etc.) guide automation and de-automation. In our present circumstances increasing pluralism significantly complicates the information environment at the meta-level. In Maruyama's language, the environment is becoming epistemologically more complex.

• "Technology" is the relationship between means and ends. It has hardware (biotechnology, laser technology, human body technology) and software (nonmaterial) aspects. It is present (inferred) in every system (solar, simian, human). "Modeling technology" refers to the manipulation of model parameters. Other species rely mainly on genes for this. Humans rely on genes and software. All software operates to control behavior. The critical question: what software for whose behavior to what ends and with what implications?

• "Power" is the ability to commit resources and to decommit them with minimal "loss" and maximal "gain." Power authorizes and de-authorizes. It plans and re-plans, designs and redesigns. Some power extends to meta-model control (elites), and has a synergetic effect on gains in many parts of the environment. Some power extends to controls which give only localized, reactive "gains" (philosophy of "poor but happy").

• Attempts to enhance alternatives for concrete choice involve the use of social technology. Social technology in practice becomes a "problem" when models generating past/present/future/ realities, desirable and undesirable, do not match up. In our type of society, the critical problem mentioned



earlier becomes critical problems as more people become manipulatively, visibly, and widely involved in the cybernetic functions. Software/hardware developments are emerging to "deal with" conflicting stasis and change, but themselves will enter into complex feedback relationships, often of indeterminate dimensions and implications.

#### Operational Assumptions

- Values are best seen as model elements.
- Values as model elements are intimately related to purposing (always humanly inferred).
- Values develop in complex interaction with intra- and inter-personal experience.
- Co-existing levels of compatible, related values constitute an "integrated" "coherent" value system (model).
- Values may co-exist in different competing/compatible models.
- Values as model elements are trickier to handle when they are at more inclusive (generalized) levels of "coherent" systems.
- Values may be planned or "designed" at comparatively less inclusive levels within pluralistic systems, but probably are developed best through inferential or "post-experiential" processes at comparatively more inclusive levels within systems.
- Value design activities are limited by the same constraints inhibiting all design activities: fixity in process and goals; reduction of heterogeneity.
- A combination of design and post-experiential approaches can be used effectively in the development of "coherent" value systems. Problem: avoid relatively excellent combinations that result in cessation of value system "evolution" (Example: static, self-satisfied tribes).
- "Evolution" of value system may be seen as a function of heterogeneity

of model elements at some level(s). More inclusive values are potent change "handles" in any system.

- Less inclusive and more inclusive values are located in cultural institutions. Organizations are social/cultural, software/hardware interface points where values and other non-material cultural elements existentially co-exist with human beings, building, typewriters and other material/ecological elements. "Social" systems are multiple locale and multiple time frame "structures" (patterns) derived from observed/inferred frequencies and types of communication and interaction among humans (and other objects) in identified ecologies.

- While species or Earth-scale approaches to value research, design, and post-experiential "creation" are not new in human history, the collective rates, directions, and types of Earth-scale changes are vastly enhanced over the past and still expanding.

- "Predicting" through normative, one-dimensional science and "controlling" through normative, one-dimensional "planning" alone will not deal effectively with Earth-scale and other levels of system change while model diversity exists and expands.

- At some levels, model homogeneity may be called for (ecosystem, violence control, population), while at other levels model heterogeneity may be widely developed (family structures, sexual behavior, life style choices). "Spaceship Earth" inherently seems to constrain certain value potentials in operational terms, especially in light of the generally low level of development in human hardware/software technologies and biotechnologies. Population size and proximity also suggest constraints, as do certain hardware-software human support systems [sewage systems; roads; food; water; and power supplies; infant socialization or programming systems ("family" and peer cultures, schools); adult acculturation systems (training systems of many types)] .

- Prediction, planning, and creative "muddling through" are therefore called for in appropriate combinations for survival and "growth".

- Humans may now be able to expand the amounts and types of information inputs to both design and trans-experiential modeling--at all levels of inclusion and within all "coherent" competing systems.

- Full development of information inputs along linear and non-linear feedback loops may allow humans many more options to feedforward (create system breaks).

- This is important because all humans are to some extent "futurists" at certain levels within their model frameworks. Feedforward is a pragmatic activity operating in both design and post-experiential processes.

- Species Information Systems (SIS), Community Information Systems (CIS), and Individual Information Systems (IIS) can be developed far beyond existing levels and allow for more feedback and feedforward at all levels inside and among models.

- The development of more sophisticated SIS, CIS, and IIS systems must be accompanied by planned, arbitrary, and random interfacing within and among the three information system "levels" by all citizens. Interaction will help to insure the greater likelihood of inclusive understanding/comparison/revision in model development while maintaining and enhancing heterogeneity at this and other, less inclusive levels.

- A Total Information Environment (TIE) would be planetary and extraplanetary, and would involve the gradual replacement of some "representative" decision-making systems by collective decision-making. Citizen participation, at whatever level and in whatever manner, would be accompanied by full demand access (with feedback) to all information sources, and by equal access to the acquisition of various skills critical to situational "management" success

(in all locales and in all time frames). Many development problems are likely in the above, but, in general, many populations and systems appear to be moving in these directions now. Model (value) development at various levels of inclusion and in various systems is occurring at the same time. One "confusion" of great promise: citizen definitions of what information legitimately fits SIS, CIS, IIS, or TIE categories will constantly vary, introducing synergistic gains in information through feedback and feedforward.

#### Some Workaday Observations

- Professional men often develop "over-socialized" conceptions of man. These notions are "natural," and serve as rationalizations as well as models and explanations.
- All assertions of powerlessness, gargantuan complexity, cynicism and opportunity by contemporary professional men are situation-related.
- But situations are misrepresented when they are over-socialized. There is a tendency to "forget" the system-breaking potential of social infrastructures, new models, and the synergistic factors that can come from the actions of individuals.
- No previous society thought of itself as other than complex. But some men and groups of the past handled perceived complexity more ably than others. This is true of the present and of most "most probable" futures, as we have envisioned them.
- Arbitrariness of the human individual or group makes system breaks possible. Since all human systems are "made up" anyway, the stochastics of these systems are subject to re-design and to post-experiential influences.
- As we are all futurists in many ways, so might we all be more able inventors in many software and hardware respects.
- Once models are invented, they can be tested in many ways, even with the use of live, consenting humans. This is not unusual, because all social/

cultural/personality systems are more-or-less experimental in the first place.

- Professional men often are not as experimental/inventive as they might be because of fear of negative assessment and other deviation correcting influences.

- Positive feedback is deviance amplifying. Positive feedback will have to be enhanced in order to obtain more new social/cultural/personal inventions faster.

- Style, which is very complex and hard to analyze, but essential to true individualization, will undergo further pluralization as positive feedback increases.

- Summerian or Skinnerian constraints <sup>OR</sup> attempts at suppression may be necessary as style (quickly?) passes acceptable limits.

- These constraints should be short-lived--only in force for as long as attempts at style suppression tend to threaten the emergence of inventions.

- Participatory democracy, under the right conditions, can be one source of informed, collective wisdom in developing and managing social/cultural/personal inventions.

- Participatory/anticipatory democracy can be an even better setting for these purposes, because it adds to collective present action an enhanced potential for decreasing the likelihood of unpleasant future surprises.

- As technology refers to the relationship between means and ends, we must recognize that operational human models (value matrices) and model elements (values) can be built, re-built, field-tested, modified, stored, and junked in extremely short time frames under conditions of consensus.

- For values to undergo such manipulation, we must have manipulators operating under temporary fail-safe constraints peculiar to perceived dangers in each type of test situation.

• In order to develop such manipulators (and we are all likely candidates), we must first begin to notice, then tolerate, then appreciate, then assist them. This requires that we change ourselves so that others may change their behavior and attempt to change us.

• Anarchy is avoided through temporary and semi-permanent consensual fail-safes (negative imperatives).

• Ignorance is avoided through provision of open information banks (of all types).

• The energy is provided by us all.

Footnotes

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The generalizations for constraints in futures research are a bit too policy-oriented--in presumed hierarchical settings--for my taste, but they are nonetheless useful:

Basic

The future is not singular.

Society, by use of its resources, can affect the future by causing certain events to occur and preventing others from occurring.

The exact nature of the future that will materialize is unknowable.

Decision-Linked

All decisions are based on some presumption about the future.

To be effective, forecasts must provide the information necessary to guide decision-makers.

Meaningful forecasts--even long-term forecasts--must always be related to current decisions or actions.

Some Qualifiers

Some future events are always unknowable.

Understanding of basic mechanisms of societal change is limited.

Under- or overestimating the likelihood of future developments is common.

Unquestioned beliefs and values limit ability to foresee basic changes in goals, particularly those that might be caused by external factors.

The probabilistic nature of forecasts requires a novel perspective if they are to be used appropriately.

There is an inherent difficulty in imaging the future, even after key events have been assumed.



It is often difficult to distinguish "desires" from "forecasts."

It is generally difficult to define and integrate cross impacts among specific forecasts.

Important possibilities are sometimes overlooked.

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Shane's "Ten Major Problems":  
The crisis of crises; the credibility gap; institutional overload; disagreement over the "good life"; the value crisis; equity vs. equality; rejection of egalitarianism; lack of a future-focussed role image for youth; insensitivity to changing patterns of survival behavior; the haves and have-nots.
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Here are Stulman's criteria for a creative proposal: It should

Be based on a new socio-economic approach with the establishment of new international values of common currency;

Act as a prototype operation encouraging self-respect, the extension of freedom and an ability to learn to live as a world citizen with concern and regard for other human beings;

Involve the individual in education on and integrative and interdisciplinary basis throughout his lifetime; advance an early conditioning to accept change; bring about more effective methods of communication.

Bring new resources and new distribution systems into play and be capable of lowering prices while increasing the quality of goods and supplying needed products for a growing world population.

Be international in scope and develop programs which permit maximum development without sacrificing the birthright of people because of their lack of preparation or knowledge, inept handling or short-sighted political actions; providing for periodic reviews in the light of changing conditions, thus helping to reduce the need for force, manipulation, secrecy or expropriation;

Help bring into being an emerging, developing international law that can respond to the constant changes brought about by increased knowledge and new values, thus replacing Procrustean-bed inequities with a flexible interplay of international concerns;

Involve international relationships working cooperatively with people everywhere on the same projects, on a role-playing basis in systems with responsible management and counseling, in a world-reference frame of value;

Provide integrative abilities and advantages so that participatns may be better assured profitable operations;

Involve ever-growing science technology systems on multiple levels with greater attention to the consequences of our actions;

Take into account growing populations and of course man's basic requirements. We must concern ourselves with ghetto-type problems--whether in urban, suburban, or Appalachian areas;

Be a germinal idea, capable of operating organismically, growing constantly and renewing itself creatively;

Bring the excitement of accomplishment, adventure and meaning into the lives of people everywhere;

Help create a growing ethical climate in which people can more easily find themselves individually, encouraging their stage developments in continued evolution.

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Wilson says popular attitudes will shift toward:

- An emphasis on the "quality of life," from the quality of products to the quality of the environment;
  - Some modifications of the old Puritan work ethic, and a growing belief that leisure is a valid activity in its own right;
  - A new "self-image" that a rising level of education bestows on its graduates;
  - A rejection of authoritarianism as an acceptable style;
  - A growing belief in the values of pluralism, decentralization, participation, involvement;
  - A heightened respect for individual conscience and dignity;
  - An increased public impatience, a "lower frustration tolerance," with many forms of economic hardship (such as poverty and unemployment), and with social injustice in all its forms.
- In sum, these (and other) changes would quite radically reorder our public and private values. Particularly among the young and the better-educated, we are likely to see a shift in emphasis:
- From considerations of quantity ("more"), toward considerations of quality ("better");
  - From the concept of independence, toward the concept of interdependence;
  - From the satisfaction of private material needs, toward meeting public needs;
  - From the primacy of technical efficiency, toward considerations of social justice and equity;
  - From the dictates of organizational convenience, toward the aspirations of self-development of an organization's members;
  - From authoritarianism, toward participation;

From uniformity and centralization, toward pluralism and diversity;

From preservation of the systems' status quo and routine, toward promotion and acceptance of change.

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COMMUNICATIONS AND CULTURE

By T. R. Ide, Chairman  
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Communications Authority

Following an intergovernmental conference on cultural policies held in Helsinki during the summer of 1972, Eugene Ionesco wrote: "No one thought of attempting a definition of culture. Simone Weil thought culture was an instrument wielded by professors in order to produce professors who in their turn would produce professors ... Nowadays, culture seems to be an instrument wielded by functionaries to create functionaries."<sup>1</sup> Ionesco went on to put his own position: "... true living culture is creation, break-up, change, evolution and even revolution"<sup>2</sup> and warned against "A new exploitation of man by man and a new alienation - the exploitation of artists by bureaucrats..."<sup>3</sup>

Despite the element of truth in the charge, we live in an era when advanced communications technology has given the artist a chance to be seen and listened to as never before. It seems to me that by his own definition of culture, Ionesco has placed the artist in the centre, with a potential for influence, unrivalled in any previous era in modern history. Rousseau thought of culture as change and while he might not have argued with Ionesco's definition, he likely would have countered the pessimistic prediction with "The reason why Diogenes could not find a man was that he sought among his contemporaries a man of an earlier period."<sup>4</sup>

It seems to me that two of the major problems we face to-day are access and literacy. For too long, access to all of those things both material and immaterial which enrich our lives and would



enable us to affect the kind of world in which we might wish to live have been limited to a relatively small segment of society. Despite efforts to make educational opportunities available to more people, somehow we have still failed to eliminate the elitist label which is firmly associated in many people's minds with culture, and the degree of literacy throughout the world is still discouragingly low. Of course the word culture has many definitions and in any theory of communications the word literacy means much more than being able to read and write.

Perhaps it is, after all, impossible to define culture. I recall a seminar held in Toronto in the mid 1960's devoted to a discussion of the philosophy of education.<sup>5</sup> One of the participants, R. S. Peters, argued that it was impossible to say anything more about the object of education, except that it is to produce educated persons. He went on to circumvent this logical impasse by describing the characteristics of an educated person, that is one who is knowledgeable, possesses a critical intelligence, is sensitive to the needs of other people, takes delight in what he does for its own sake, understands the principles which underlie such worthwhile activities, engages in many pursuits, and is influenced and his sensitivity deepened by what he knows. As with education, our understanding of culture has many dimensions.

The artistic inference is probably central to most people's understanding of the term. In this sense culture consists of the performing arts, the exhibiting arts and the creative arts.

On the other hand, writers such as Reisman have given it a sociological implication. They are concerned with leisure time activities, work structures, occupational characteristics and human relations. Thirdly, anthropologists have been interested in studying the habits, customs, morals, languages and laws of groups of peoples. Finally, there are those who imply a spiritual connotation - embracing whole ways of life. Under these four headings - the artistic, sociological, anthropological and spiritual - we can talk about culture in a narrow or a broad sense and keep in mind in each case the particular frames of reference by which it is possible to examine the effects of the various means of communication, and the media by which they are transmitted. There are obvious dangers in attempting to classify culture under any number of headings. C. P. Snow<sup>6</sup>, after publishing his provocative sketch The Two Cultures, revealed some of the difficulties he encountered in deciding upon the number 2, that is the "scientific" and the "literary intellectual". There are, of course, any number of divisions which might be selected.

Freud recognized that high levels of civilization can be equated with success in the utilization of the earth's resources for man's benefit. The introduction of metals, for example, put an end to whole cultural epochs. But this is only one of the modes he identified. Others are more difficult to quantify. "We soon become aware that the useless thing we require of civilization is beauty;..." And "... last and certainly by no means the least components of culture, the ways in which social relations ... are regulated, all that has to do with him

(man) as a neighbour, a source of help, a sexual object towards others, a member of a family or a state." Kant defined culture as aptitudes within free individuals for chosen ends, and set as the principal objective of nature the need to prevail over the violence of inclinations, and hence to make way for the development of our humanity. He, like Snow (but for different reasons) considered that it was Fine Art and the Sciences which make man civilized.<sup>8</sup> Hegel talked of the spirit of a people as being determinate and modified by the degree of its historical development. "It is thus one individuality which presented in its essence as God, is honoured and enjoyed in religion; which is exhibited as an object of sensuous contemplation in Art; and is apprehended as an intellectual conception in philosophy.<sup>9</sup>

If there has been confusion about what we mean by culture, discussion regarding the nature, importance and effect of communications has been blurred by such a variety of interpretations as to make it almost impossible to distinguish the assumptions which are implicit in the arguments of many so-called experts. To some authorities it refers to the transportation of goods and services by land, water and air. To others it means the transmission of messages by physical or telecommunications systems. A recent UNESCO Report<sup>10</sup> states that social communication involves both inter-personal contact and mediated communication in which information is carried by technical facilities or other intermediaries, such as the press, news agencies, radio, television, cinema, telecommunications, data processing, recordings, cassettes, and other new technologies.

For the purposes of this paper, the word communications will be understood in its social and inter-personal context. Primary modes are self-sufficient in that they are complete and do not necessarily depend upon one another, that is the verbal, gestural, visual, mathematical and musical devices, by which human beings exchange their ideas and feelings. Secondary modes such as poetry, dance, cinema, and television utilize the elements of the primary but defy exact translation into any other. Tertiary modes do not harm the characteristics of self-sufficiency and non-translatability and tend to be highly practical in their objectives, such as architecture and engineering.

The verbal mode has acquired a special status in society and has been equated by some with facility in thinking. Wittgenstein, for example, felt that philosophical "puzzlement" can be eliminated by scrupulous description of language as we actually use it. Yet it is the gestural which is not only the most primitive but also the most universal. Body language is a relatively new term which has become increasingly popular with armchair psychologists, yet there is no doubt a need for study and understanding of this most fundamental means of communication. An American Authority contended that vision is the primary medium of thought. Whether he is right or wrong there is no question of the power of the ikon and the picture. When the images are allowed to move the complexity is increased, and by manipulation of phenomena the strange may become familiar and the familiar strange. It would be tempting to try to simplify the

description of the mathematical mode by calling it symbolic but the coding is more complex than identification with a special kind of notation. Piaget<sup>12</sup> warns specifically against this and Hadamard<sup>13</sup> insists words and the mental use of algebra are totally absent from his mind when he thinks. The great mathematicians have not only been logicians but also philosophers able to make major intuitive leaps. A recent CBC television program was devoted to an analysis of the life of a fetus in the womb. It provided a fascinating picture and a description by a Canadian scientist of the impact of music, pleasurable to the mother, on the heart beat, and hence presumably the emotions, of the fetus. The positive correlation was unmistakable. Music is obviously an essential element in our communications armamentarium.

Each of the modes described has its own elements, and confidence in using them depends on the development of skill in manipulating their notational and technological forms. One of the major problems which has plagued mankind for centuries is illiteracy. Too often we have applied this term only to the verbal mode. When we come to consider the communications media and cultural development, it will be increasingly apparent that literacy in all modes will be essential if mankind is to be permitted to grow and develop in freedom and enlightenment. The full and satisfying human life, idealized by Plato, is only possible if all men are literate - literate not only in the verbal mode, but in the others as well. We live in the age of the mass media. These media are

only those devices through which human beings communicate with one another. Books, journals, magazines, newspapers, the telephone, telegraph and radio use words. Radio, film and television use words and music. Films and television use words, music and pictures. Books, journals and illustrations convey mathematical reasoning - and telecommunications transmit all of these with the speed of light. The impact on the cultural modes - the artistic, the sociological, the anthropological and the spiritual - is correspondingly magnified to an ever increasing degree.

The UNESCO Report referred to earlier stated that communications is crucial if we are to obtain a greater quality of life. In less industrialized countries there is little hope that urgent goals may be reached in a short time, whereas in highly industrialized countries the media threaten all of the social values. One of my colleagues at the OECA, Elwy Yost, made an interesting point when he referred to the fact that the concept of political liberty first took root in the Netherlands because of boggy ground. Military power and control depended on the communications power of the cavalry. But in the Netherlands the cavalry could not get through so efficiently, and hence the area was ripe for independent thinking. However, there is an optimum medium for any message. For example - not horses for boggy ground or memoranda for public forums. When the medium and the message are not in harmony, human alienation can occur.

The indirect effects of the communications media have been studied by many. Harold Innis, in Canada, became interested in the effects of the fur trade and the development of the CPR on cultural development. The relationship between communications systems and the society surrounding them led him to the conclusion that such systems are themselves staples in the same sense as other commodities. Changes in communications media result in the dislocation of existing cultures, the creation of knowledge monopolies, with the objective of cultural and physical domination.

A second Canadian, Marshall McLuhan, went further and identified specific communication modes with corresponding cultures. The oral/aural he equated with the jungle, the scribal/aural with Medieval Europe, the visual/literate with Renaissance Europe, and the electronic with the global village of the present. In the first we live in "acoustic space" dependent on speech comprehended by the ear, unlike the eye which makes a conscious attempt to focus on the event. A change in physical orientation does not change materially the message apprehended. We hear equally well, upright or reclined, from the right or from the left, from the front or from the rear. Thus, oral transmission is less susceptible to segmentation than the visual. Consequently, man is better able to relate a variety of messages to reality. The second is not unlike the first, since the transmission of recorded knowledge was done by the oral/aural mode. But the visual/literate is conditioned by the eye which requires a frame of reference, a focus, and is distracted by irrelevant objects

to a significantly greater degree than the ear. The development of moveable type led man to a fixed point of view of an assembly line nature. The "homogeneous repeatability" of type resulted in an extension of this principle into all forms of production and social organization identified with the western world. McLuhan argues that the invention of moveable type caused, among other things: the rise of national states, the Reformation, and the introduction of perspective in painting. The electronic age, he claims is breaking down the "visual tyranny" over our other senses since it includes all senses and is instantaneous in its impact. It demands a high degree of involvement. National barriers are being broken down and "The Global Village" is at hand.

Whether or not McLuhan is right, there is no doubt that the media themselves are not only the carriers of other cultural forms, but are also methods of cultural expression in their own right. For many people they are likely the only type of cultural communication available. This has been particularly true of the press, radio and television which make access to information, educational opportunities and exposure to the arts possible for the first time. There are obvious benefits. At the same time they bring danger and new threats to the stability of institutions on which individuals have relied for centuries, and hence are responsible for what has become popularly known as the age of anxiety. In short, they bring new opportunities, new challenges and new problems.



In Canada in recent years there has been a strong movement concerned with not only economic but cultural nationalism. Legislation has been enacted at both the provincial and national levels to protect the precarious position of Canadian publishing houses, radio, television and films. Philosophically, we must face the dilemma created by the rights of individuals for access to the whole world of culture with the rights of national cultures to resist dilution by influences from the outside. The question is not significantly different whether we are discussing the Canadian-American problem or the Canadian-native peoples controversy. However, as far as television is concerned, the question may soon become academic. The CTS satellite, expected to be launched in August 1975, will test the viability of low cost ground receiving stations. If the experiment is successful, and all the present indications are that it will be, by the middle of the next decade we can expect to be bombarded by signals originated by the major industrial states. Some experts fear that this new technology could portend a new communications colonialism if present tendencies towards one-way traffic are not quickly reversed, since electronic walls will obviously no longer be possible.

There are perhaps more serious and immediate problems. In North America the concentration of ownership of the media in general, and the press in particular, has led many people to question whether they are, consciously or not, imposing their own set of values on society. Where the control lies in the public sector,

what guarantees are there that controversial topics will be treated with that degree of objectivity that freedom from political interference should ensure. In Canada the CBC and the OECA have been remarkably free from criticism of this sort. However, in the United States, during the past year the Nixon administration has used the club of financial support to undermine the position of the Public Broadcasting Corporation which supplies national programs to a network of educational television stations. While there has been strong vocal and editorial opposition to this development, it seems likely that controversial commentaries, such as "The American Dream Machine", Buckley's "Firing Line" and the "Washington Week in Review" are doomed. On the other hand, where private enterprise is responsible, the outlook is equally, if not more pessimistic. Commercial support is almost directly proportional to the size of the audiences reached. Hence, even as the number of signals increases, you often get a multi-channelled unanimity at the lowest level of content. The whole question of mental pollution must take a higher rank in the ecological priorities of the day if the potential for disaster predicted, in The Limits to Growth<sup>14</sup> by the Club of Rome for the early part of the next century is to be avoided.

Most of the foregoing comments refer to the electronic media. The problem with the press seems to be equally serious. There seems to be no reversal of the trend towards concentration of ownership and reduction of outlets. Despite an expressed desire for

a greater diversification of opinion and viewpoint, more and more we seem to be subjected to the one-sided story approach. Perhaps it is because of the nature of the news itself, rather than any concerted effort on the part of management to create public opinion, that the initial release makes the headlines and "the other side" is relegated to the "letters to the editor" page. Nevertheless, major groups in society must be developing severe persecution complexes. In Canada the medical profession seems to be the current whipping boy, yet union members, teachers, university administrators, and politicians - particularly politicians in power - must feel a certain sympathy for their plight. I don't know why it is - perhaps Horatio Alger spoiled us all - that we delight so much in reading about the misfortunes, the failures, and the disasters that afflict our fellow man, but there is no doubt that success is a bad word - particularly if it is a local phenomenon. It is, of course, important to be wary of the practice of killing the messenger who brought the bad news. The press in the United States is under an attack mounted by the Vice-President and with substantial popular support. The threat to freedom of speech is not inconsequential.

As to the fundamental question of the relationship between the communications media and culture, the media offer a new kind of access to cultures which have been formerly limited in their primitive forms to special groups and, in their more sophisticated developments, to an elitist element of society which is entirely inconsistent with the democratic ideal to which we so readily give

lip service. The Toronto Symphony, subsidized with public funds, plays to "sold out" audiences of 2,300 people at Massey Hall.

Yet it is likely that these audiences consist of essentially the same individuals week after week, a hardly impressive percentage of the between two and three million which populate the area.

It is interesting to note that, when the environment of the concert changes, so does the size and make-up of the audience. During the summer concerts at the Forum in Ontario Place, upwards of 20,000 people would gather, sitting not only in stands, but also on the surrounding small hills where the opportunity to drop out was equal to that of dropping in. When concerts are televised, the size of the viewing audience is many times that for a live presentation and, although not large in contrast to the number who used to watch NHL hockey, is substantial.

If one agrees that access to cultural expression is a function of environment, that is Massey Hall, Ontario Place or the television networks, then the question of literacy becomes one of prime importance. There is no lack of audiences for programs whose content makes minimal demands on the literacy levels of the individual. Even for the conventional meaning of the term most of us are relative dunces. Yet educational institutions have designed their courses around reading and writing with emphasis not only on the primary skills required but also on critical assessment and appreciation. If our inadequacies are so apparent with respect to verbal literacy, imagine the magnitude of the problem we face in

coming to grips with literacy in the visual, mathematical and musical modes. A year ago I was asked to talk to a second year class in Communications Arts. The presentation was based on an OECA program which had won a number of international awards. It was a fine program skillfully produced and deserved the recognition it had achieved. It was also about Canadian nationalism, an obviously popular subject. Before seeing the picture the students had a chance to look at the gold statuette and read the citation. At the conclusion of the showing there was a standing ovation. However, despite the fact that it was a class in Communications Arts, no one had realized that the program was a form of propaganda, that the producer had mixed fact and fantasy so skillfully that the conclusion was not recognized as one man's opinion but rather as a historical imperative.

A major impediment to the acquisition of fluency in any medium has been the mystical quality with which it has been endowed. The medicine man in early societies played on this element. So too in the Middle Ages, possession of the necessary skills in reading and writing was reserved to the religious orders. Today, even in countries where literacy in the print medium is relatively high, the reader tends to place undue reliance on the truthfulness of what he reads in a book, periodical or newspaper. What is needed is a healthy skepticism and the understanding that, behind the published article, is a fallible human being. The problem with respect to the visual media in general, and television in particular,

is even more serious. The "seeing is believing" syndrome is a natural outgrowth of the observational techniques associated with the scientific method. Yet, by the use of skillful editing techniques, the producer is able to distort reality without appearing to do so. By a clever mix of fact and fantasy, the viewer can be convinced that he is objectively examining evidence and arriving at independent conclusions. It will be only when the individual learns to create in the medium that he will be able to examine critically what he is watching in the works of others. Although a grammar as such has not been identified and accepted, a number of textbooks and journal articles have appeared which attempt to systematically explore the techniques of television production. It is in a film entitled Heartbeat,<sup>15</sup> however, that the language of television has been formulated in terms of eight elements which are used in television advertising to build a moment of sensory impact. These elements are movement, time, space, colour, facial images, spoken words, natural sounds, and music. By electronically structuring these, reality can be duplicated or enhanced. Music, motion and colour can build an emotional response without tapping the viewer's own experience per se. It is further observed that the dissolve, the fade, the close-up, the long shot, motion, image and sound can become more meaningful than the dot, dash, exclamation mark, italics, or the still photograph in four colours.

Whether we consider culture to consist of the artistic, the sociological, the anthropological or even the spiritual modes, the communications media bring us new opportunities for enriched living and guaranties against the tyrannies that are inevitable when knowledge and understanding reside in the hands of the few. The key word is access, universal access, and the key condition is literacy. Without access, our society will be culturally deprived, with all the sociological and anthropological implications; without literacy - literacy in all the communications modes - access is meaningless and we leave ourselves open to propaganda made far more dangerous by our ignorance.

FOOTNOTES

1. Eugene Ionesco, "Helsinki Notebook", Encounter, Vol.36, No.12 (December, 1972), p.55.
2. Ibid.
3. Ibid., p.57.
4. Jean-Jacques Rousseau, On the Origin of Inequality ("Great Books of the Western World,") Vol. 38 (Chicago: Encyclopaedia Britannica Inc., 1971), p.362.
5. Philosophy and Education, (Proceedings of the International Seminar March 23-25, 1966, No. 3 Toronto: The Ontario Institute for Studies in Education).
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7. Sigmund Freud, Civilization and Its Discontents ("Great Books of the Western World,") Vol. 54 (Chicago: Encyclopaedia Britannica Inc., 1971), p.779.
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11. Rudolf Arnheim, Visual Thinking (Berkeley: University of California Press, 1969).
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13. J. Hadamard, The Psychology of Invention in the Mathematical Field (New York: Dover, 1954), p.75.
14. Donella H. Meadows et al., The Limits to Growth (Washington, D.C.: Potomac Associated Press; 1972).
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"THE POLICY SCIENCES AS AN ALTERNATIVE TO  
THE HETEROGENEITY OF SOCIAL SCIENCES"

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The purpose of this paper is to present the policy science as a valuable alternative to different segmentary approaches of public policy making process.

SECTION I - Why is the study of public policy making process so important today.

1. More and more people are thinking that the future of mankind is not going to depend so much on the discovery of new technologies but on radical innovations at the political and social level.

Therefore, the search for new organizational, institutional or normative formula becomes a crucial challenge today.

Post-industrial societies are characterized by the growing influence of science and technology and by their interaction with the political system.

A consequence of that phenomenon is more instability and complexity in political, economic and social institutions and more uncertainty concerning the secondary effects of politics.

Therefore, it is strongly requested to analyze rigourously the qualitative changes of our society to see in what way they contribute or not to our well-being.

The social scientists are more conscious today of the important role they have to play : social sciences appear to be more necessary at the interface between technology and society than at the interface between fundamental and social sciences.

However, the general feeling is the impression of a "lack of perspective" : this paradox of a poverty of perspective is a central problem for both the social scientist and those who attempt to guide our society toward a fuller realization of its potentials" (1).

Indeed, a lot of important questions have no answer yet in the public sector : for instance, the following ones :

- "How scientific knowledge translated into means to reach public goals can be conceived to serve human needs? ..."
- "How much responsive is the political system to the new paradigms of science i.c. innovation ?"
- "Do we see or not a crisis of the concept of "growth" as a desired scenario for the future ?"
- "Is there a similarity of criteria of decisions among citizens and policymakers ?"
- "What are the collective outcomes of policies, especially, their distributional effects ?"

2. When we compare the way the public and the private sectors have reacted to these problems, three remarks have to be made about the public sector :

1° the public sector presents some special difficulties :

Some variables are difficult to measure : for instance the success or failure of a policy : the function of evaluation is very complex in the political system.

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(1) Bertram Gross and Michael Springer : " A new orientation in American government" in the annals of the American Academy of Political and Social science - May 1967 - p. 6

The objectives of the political system are more numerous and uneasy to grasp, i.c. in education, health, etc. ...

- the private sector considers the firm as a resource or as a controlled variable. In the public sector, the bureaucracy behaves as constraints or independent variable with its own logics.
- the political system is an open and dynamic system, more subject than a private firm, to the contradictory influence of external parameters.
- because of the multiplicity of interests, and actors, bargaining keeps being usual and practical strategy of decision but it makes difficult and radical change of politics.

2° The efforts to modernize the political administrative system have been partial, unimaginative, and often unsuccessful because of the use of a fragmentary approach at a time where the synthetic aspect of knowledge is strongly required :

"Fragmentation implies that those who contribute to the knowledge process base their vision of the whole and concern themselves almost exclusively with their speciality.

They evolve ever more complex skills for coping with their immediate problems. They give little attention to the social consequences or the policy implications of what they do" (1)

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(1) Harold D. Lasswell "From fragmentation to configuration"  
Policy science - vol. 2 - n°4 - December 1971 - p. 440

Let us give a few examples :

- When new institutions are created to respond to new needs like the European Market or the Council of Europe, the founding fathers too often reproduce the kind of institutions already inefficient at the national level : i.e. the European Parliament.
- When some creativity emerged for instance from the creation of the European Commission, conservative reactions quickly succeed in reducing its impact.
- When the public sector adopts new technologies for instance information technology or management techniques, these innovations are applied lately without critical mind and without making any difference between the public and private sector. This is a major error because the classical economic theory applied in the private sector is dominated by two principles : the production model and the criteria of evaluation which is the maximization of benefits from investments. These principles are not necessarily operational in the public sector where specific variables intervene : psychological factors, political, social and cultural feasibility ... , lack of competent people, a different kind of rationality (1).
- During several years, there was a lack of interest of organization theorists for the public sector and consequently few impact of their work on the organization of the political administrative system. For instance, too few attention was given to a crucial problem which is the cohabitation, almost inevitable in one hand the same political system, of organizational structures among opposed principles such as :

(1) See Ida R. Hoos : "Systems analysis in public policy" a critique" - 1972 - Berkeley and Los Angeles - University of California Press - see the paper of Stuart A. Umpleby "The revolution that fizzled the lack of impact of cybernetics on political science".

- administrative structures of a bureaucratic and hierarchical type
- democratic structures of a participative type
- technocratic or professional structures of a functional type.

SECTION II - The policy science as an alternative to study the public policymaking process

§1. Definition of policy science

In the glossary of his book "Ventures in policy sciences"

(1) Y. Dror gives the following definition

"A new supradiscipline, oriented towards the improvement of policy making and characterized by a series of paradigms different in important respects from contemporary "normal sciences"

Three remarks can be deduced from that definition to illustrate the "unifying" character of policy science.

1) Policy science is a supradiscipline : it is more than an intellectual movement. Policy science is "a superimposed term covering a broad set of studies, disciplines, and professions which cluster around the application of knowledge and rationality to perceived social problems" (2)

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(1) "Ventures in policy sciences - concepts and applications" - 1971  
New York - American Elsevier p. 3

(2) Y. Dror "Design for policy sciences" - 1971 - New York - American Elsevier .. p. 49

Policy science especially takes advantage of the progress of four disciplines :

- 1° the management science and decision theories (O.R., P.E.R.T., systems analysis, game theory, simulation, P.P.B.S., etc. ...): these innovations have forced the public policy making to get out of traditionalism and incrementalism.
- 2° the futurology and prospective research : the methodological rigor, the choice of concrete problems, the emphasis on long range planning are progressively increasing the credibility of that kind of work among the most dynamic private and public departments.
- 3° the applied behavioral science and social technology  
We think especially of social indicators which complete economic indicators and improve the efficacy of systems analysis , P.P.B.S., etc. ...  
We have also in mind the development of case studies, "pilot"projects, social experimentation facet, analysis to grasp more adequately the qualitative aspect of social and political reality.
- 4° an evolution of the economic theory - we see some tendency to more voluntarism for instance in the treatment of non market goods, of "externalities", of "indirect" effects of economic decisions.

"The limitations of narrowly economic models for the guidance of decision have become evident. Economists have been enlarging the scope of their models to include more of the social process, whether they continue to employ economic technology or not" (1)

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(1) Harold - D. - Lasswell : "A preview of policy sciences"  
1971 - New York - American Elsevier - p. 3

- 2) Policy science is polarized around the analysis and improvement of policy making. Policy science is looking for dynamic, open, retroactive complex models : this is a progress compared to the analytic, intemporal, or historical static models of functionalists.

Policy science considers that a combination of related improvements has to take place at different levels :

- at the level of philosophical and normative presupposes.  
Policy science does not consider any more that values are not a scientific topic because they would introduce arbitrary judgments : this is important to find out new formula and new concepts of democratic theory.
- at the level of structures : policy science tries to take advantage of organization theories to improve the public sector.
- at the level of decision : policy sciences improves the incrementalist approach without being limited by the mechanized, instrumental approach of management sciences.

"Policy science constitutes, so it seems, a suggestive designation serving to emphasize the intention behind the term as the matter of actual importance : that the total resources of the cognitive modality be brought to bear in an organized effort to comprehend and improve the institutional policy making process" (1)

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(1) Milton Marney : "Institutional self-organization"  
Policy science - (2) - 1971 - p.127



- 3) Policy sciences is characterized by a series of new paradigms which are a positive answer to the question asked by M. Radnor : "does policy science represent a critical shift in the technical and organizational skills which can be brought to bear in both solving and predicting such problems and in institutionalizing this awareness" (1)

## § 2. New paradigms of policy science

### A. The fundamental unitary paradigms of rational analysis.

The western culture has developed a type of rationality which has two weaknesses (2)

- 1° the reductionist tendency : the control, central notion of rationality, cannot be conceived as a problem of self-organization, self-adaption of the actor through a holistic and systemic conception of his evolution.
- 2° the absolutist tendency : the problem of control is isolated from the process of evolution in an a-historical perspective. Applied to policy making, that rationality is essentially instrumental, functional or technical : "Rationaliser une conduite, writes Bernard Cazes, c'est identifier ce que l'on cherche à atteindre pour ensuite choisir entre les diverses solutions envisageables celle qui donnera satisfaction au moindre coût" (3).

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- (1) Michael Radnor : "Management sciences and policy sciences" Policy sciences - vol. 2 - n°4 - December 1971.
- (2) Milton Marney : "Institutional self-organization" Policy sciences 2 - 1971 - p. 131
- (3) Bernard Cazes : "Qu'est-ce qu'un choix rationnel" Diogène - n°70 - avril-juin 1970.

That conception of rationality has four weaknesses

- 1) It is frequently in conflict with political bargaining and creates confusion in decisions : "we find ourselves forced to start from the extraordinary premise that in vital undertakings, such as the selection, definition, and in some montrivial way, the creation of our futures, the less than rational governs the decisions, while the rational inspires the operations" (1).
- 2) Rationality is not a linear process according to which the more detached is the actor, the more rational will be the decision : "Rationality still viewed here in terms of the selection of means to realize one goal is, thus, not the maximization of instrumental rationality but a proper balance between the selection of means according to their instrumental merits and sustaining the goal commitment" (2).
- 3) Instrumental rationality does not take care of constraint on decision making like the personality of the actor, the necessity to negotiate etc...
- 4) It does not consider either the content of the decision

The policy science tries to enlarge that limited approach of rationality.

Y. Dror insists many times on the necessity to consider organizational constraints and what he calls "irrational factors" (for instance the psychology of a leader).

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- (1) Hassan Uzbe Khan : "Toward a general theory of planning" in "Perspectives of planning" ed. by Erich Jantsch - UECD - 1968 - p.70.
  - (2) Amitai Etzioni : "The active society" - 1968 - New York Free Press - p.258.

That new perspective is better but may be questioned on two points

- 1) the name of "irrational" to qualify behavior is not adequate : what is behavioral is not necessarily irrational
- 2) Y. Dror does not seem concerned by the content of decision.

We think that the approach of Y. Dror must be improved according the perspective of Bertram Gross : "Rationality must be rescued from narrow considerations of mere feasibility and consistency and must be oriented toward what is truly desirable. This approach recognizes that organized rationality in the form of science and the professions is always the servant of some structure of power and some set of values" (1)

In the same way, Rolf - Richard Grauhan and Wendelin Strubelt write (2) "Our argument is that unless the instrument of rational (or optimal) models of policy making are combined with a conception of national goals, they can be neither rational nor optimal because their optimal quality will remain a formal façade behind which the real policy making process can be poisoned by the irrationality of the goals pursued".

In that way rationality cannot be separated from the research of objectives and norms which inspire the system.

That kind of rationality, on the other hand, has to be viewed in a dynamic perspective of continuous adaptation.

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- (1) Bertram M. Gross : "Planning in an era of social revolution" Public Administration Review - May-June 1971 - p. 290
  - (2) Political rationality reconsidered : notes on an integrated evaluation scheme for policy choice Policy sciences - vol. 2 - n°3 - summer 1971 - p. 254.

"It (rationality) has the definitive connotation of system optimality of "cognitive control" but this "optimality" cannot be independent of the cybernetic characteristics, objectives, norms, constraints and the psycho-social biological domain of interaction specific to the given cognitive system" (1).

To summarize, that new rationality combines three dimensions.

- 1° internal consistency : that is to say instrumental rationality of management type meaning clear definition of problem, research of new alternatives, identification of costs and benefits, separation between policy making and decision making.
- 2° feasibility : all the authors of the policy science insist on that factor. Y. Dror, for instance, analyzes the problem at three levels (2) : the actor, the alternatives and the concrete domain.
- 3° desirability of objectives : the normative conception of the optimality of human choice keeps being at the center of rationality : "without such a material concept of optimal quality which is taken from the sphere of what is possible, all efforts to secure procedural optimal quality of the choice process would be in vain" (3)

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(1) Milton Marney : "Institutional self-organization"  
Policy sciences 2 (1971) p.140

(2) "Ventures in policy sciences" 1971 - New York - American Elsevier - Chap. 8.(3) Rolf Richard Granham and Wendelin Strubelt : "Political rationality reconsidered" - Policy Sciences - vol. 2 - n°3 - 1971 p. 255 - 260.

## B. The subsidiary paradigms.

The other paradigms of policy science are deduced from the unitary paradigm of rational analysis. They are the following :

1) a comprehensive approach of policy making

interpenetration of means and ends, of different criteria of decision, of organizational, normative and factual elements in the analysis of policy making.

2) A rupture of the separation between pure and applied sciences

the political administrative system becomes the laboratory of analysis and experience.

3) Increased interpenetration between descriptive, predictive and prescriptive sciences

the final objective is the optimal strategy, the optimal policy and the optimal organization.

4) An evolutionist, historical, relativist perspective :

"the word "rational" like the word "good" denotes a completely general idealized criteria, a concept having operational rather than substantive significance open to any one of an indefinite number of interpretations given a specific context"(1)

5) the search of new alternatives trough creativity and imagination : "main emphasis on policy alternative innovation, involving - (1) intense attention to creativity, encouragement and input of novel policy designs into the analysis.

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(1) Milton Marney : "Individual self-organization" Policy sciences  
(2) 1971.

- (2) much reliance on sequential decisionmaking, learning feedback and social experimentation, instead of "models", simulation, and detailed policy schemes (such as P.E.R.T.) and
- (3) much attention to systems - nova - design, in addition to systems - redesigns" (1).

6) consideration of some constraints i.e. combination of interests evolution of options, limited capacities. However, the policy science recognizes that these limits can be reduced : instead of talking about "bounded rationality" like Simon, it prefers talking about "expanding rationality" through interdisciplinary synthesis, development of information technology, emergence of new kinds of specialists.

To summarize the different paradigms, we think the group could fruitfully discuss the following table presented by Milton Marney which makes the bridge with the problem of methodology(2).

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- (1) Y. Dror : "Prologomena to policy sciences" - Vol. I n° 1 spring 1970 p.142.
  - (2) "Institutional self-organizations " - Policy sciences - (2) 1971 - p.125.

Prescriptive Science

Management category of practical decision making	applied	theoretical	meta theoretical
entrepreneurial	intuitive factorizations	normative theories - decision valuation-organization	philosophical reconstruction
organizational	decision models	management models	rational paradigms
programmatic	simulations	analytical procedures	unified methodology
operational	suboptimizations	optimal-decision process	complementary modes

### § 3. The Methodology of Policy Sciences

The methodology is essentially pluridisciplinary and, in a second phases interdisciplinary (linear and structural interdisciplinary).

The advantages of that methodology are evident

- one avoids narrow perspectives of too specific disciplines
- one escapes from false hopes of solution going further than the sphere of competence of the concerned speciality. In other words, the effect of Error is considerably reduced in favor of "convergent validity" (1)
- Policy science will reintroduce traditional disciplines in the framework of new questions : for instance : law will be considered, not only as an agent of stability but as one factor of change among other instruments of change.  
: management techniques will be used as a tool of policy making among others.

The common denominator of all these efforts will be the search for a general theory of systems, which is the ultimate objective of policy science.

According to Marney, the concept of system should be viewed in an organismic perspective, which implies two qualifications. (2)

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(1) See the paper : "The revolution that fizzled : the lack of impact of cybernetics on political science" by Stuart A. Umpleby.

(2) Milton Marney and Nicolas Smith : September 1972 : "Interdisciplinary synthesis" Policy sciences vol.3 n° 3 p.299-324.



1. irreducibility : a "holistic specificity" will be attributed to the concept of system : no decomposition into independent terms will be a valuable representation of the system.
2. idiosyncrasy : a combination of "particular" and "synthesis" will be realized. In other words, the system will be partially, at least, autonomous.

"An "organismic" system concept so far permits things of very dissimilar appearance to be thought of consistently as alike in some essential respects, namely in certain features of the way in which they are organized" (1).

That systemic synthesis is only possible through a perfect taxonomy which is far from being realized. To organize their taxonomy, Marney and Smith distinguish four levels : practical, theoretical, metatheoretical and primitive : it is of course at the theoretical level that the semantic unification is the easiest one.

To conclude we will say that we believe that the policy science is a stimulating strategy to increase communication between different social disciplines but that many obstacles remain to be suppressed : especially -

- at the level of the scientific community : there are strong resistances to keep the old scientific paradigms even if they become unable to grasp the reality. This fact raises the problem of the reorganization of the educational system and of the universities.

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(1) Milton Marney and Smith : "Interdisciplinary synthesis"  
Policy sciences - vol.3, n° 3 - september 1972, p.309.

- at the level of the political system : there is an open or a latent hostility between traditional political and the new elites (1).

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(1) For further detail, we refer to the "notes on communications problems for futurists" by Harold A. Linstone.

## SUPERMAN HAS HAD HIS DAY!

or how can we speak of the future?

by J. Christopher Jones,  
Open University, England

When Eleonora Masini asked me to write this paper I was in a dilemma. I like the idea of trying to make life more human but distrust the phrase "humanization of man" which implies that we ourselves are not human now. Who is "man"? Who is "we"? Is "man" the people attending the Conference, is it futurologists, is it the government, or is it everybody? I sensed a deep contradiction between humane intentions and inhuman language.

My way out of this dilemma was to take a lesson from John Cage, originally an inventor of new forms of music and more recently a composer of written texts on the topic of world improvement. (It is he, not I, who should have been invited to speak on this topic). What resulted is an imaginary conversation composed by a chance process which unpredictably mixes statements from a number of sources chosen by myself as being relevant to the topic. The voices in the conversation are:

THE SUN: I found a copy of the SUN, a British popular newspaper, while out on a walk when deciding how to write this paper. In it was an article about the future of women. I decided to incorporate the article as an example of futures research reaching ordinary people via the media. The paragraphs appear in the same order as in THE SUN.

BUCHAREST : The statements about communication media are the most relevant example I could find of futures writing. They are taken from the Report of the Communication Working Group at the Third World Futures Conference, Bucharest, 1972. This report struck me as being very helpful to us as it is about "the problems of communication in a conference.... concerned with the total future of man".

KIPLING: The poem FEAR by Rudyard Kipling, appears line-by-line throughout the paper. I was reminded of this poem when I read in the Bucharest Report of the fear of giving official information about the future to the public.

BUCKINGHAMSHIRE: THE WORDS IN CAPITALS are taken from a list of twenty-four natural and man-made things or events that I noticed during my riverside walk in Buckinghamshire, while collecting

material for this paper. They are meant to bring the present moment into a paper that would otherwise refer only to the future, the past, or to other imaginary abstractions.

ME :                   These comments are my own opinions. In each case the chance process selected a topic from my rough notes and told me how many words I had to write about it.

The chance process consisted of using a table of random numbers to select which voice to speak next and in some cases to choose a statement from a text or determine the number of words.

The effects of presenting a paper composed by chance is to take the author off his pedestal and make him a member of the audience with whom he shares the active process of perceiving the text that has been assembled automatically. In a conventional paper the author does this active perceiving alone and in private leaving the audience with the passive process of attending to the pattern he has already perceived. This paper has yet to be interpreted and everyone's interpretation could be different.

Chance composition is, in this case, an escape from the academic convention that "man", the topic of the conference, is outside ourselves. As interpreters of this collection of man-made messages we are, I hope, conscious of being inside the topic. As Heisenberg writes, quoting Neils Bohr "When searching for harmony in life one must never forget that in the drama of existence we are ourselves both players and spectators".\*\*

\* Diary: How to Improve the World (You Will Only Make it Worse)" in A YEAR FROM MONDAY: NEW LECTURES AND WRITINGS BY JOHN CAGE, Calder and Boyars: London, 1968.

\*\* Werner Heisenberg, PHYSICS AND PHILOSOPHY, Harper Torch Books, Harper and Row: New York, 1958.

- THE SUN: Superman has had his day!
- KIPLING: Ere Mor the Peacock flutters, ere the  
Monkey People cry,
- BUCKINGHAMSHIRE: PLASTIC SHEETS
- THE SUN: By 1980, man's bluff will finally have  
been called.
- BUCHAREST: Problems of communication in a conference,  
especially a conference concerned with the  
total future of man. How may greater  
participation in such conferences be  
brought about? How may new ideas emerge  
which transcend established disciplines and  
specializations?
- ME Humanise ME?
- BUCHAREST: .....communication can take place only  
within the power constellation of a society,  
.....
- THE SUN: The struggle of women against thousands of  
years of male domination will be over.
- THE SUN: And the rate race will have slowed to a  
happier, healthier pace.
- BUCKINGHAMSHIRE: THE NOISE OF MACHINES IN A LONELY FIELD.
- ME: Are we living now in a future that was  
foreseen and described by the prophets of  
the past? I feel that industrial life would  
not have evolved without the influence of  
Moses, Aristotle, Jesus, Descartes and  
others. I also feel that Rousseau, Marx,  
Mumford, Marcuse, Ellul, Cage, McLuhan and  
others have shown how to escape its  
inhumanity.
- THE SUN: This revolutionary theory is, surprisingly,  
the brainchild of a man - American political  
scientist Konrad Kellen\*
- THE SUN: The change will come, he says, not just  
because women will take over more jobs, but  
because womanly qualities - warmth, compassion,  
calm - will replace men's pre-occupation  
with power, competition, aggression, money  
and technology. Life will become human again.
- THE SUN: Family and sexual problems will diminish,  
he says, because people will be less hostile,  
less exhausted. Politics will become saner  
as He-manism declines.

- THE SUN: Historians, he says, will record this century as the period when men faced the fruits of their own power - growing crime, drug addiction, rebellion, inflation, strikes, racial strife and social unrest.
- BUCHAREST: ....the flow of communication. Is it a one-way, outward flow from the centre and from established authorities, or does it permit feedback, interchange, confrontation across society?
- ME: I am tempted to give up futures research because futurists write in a machine-language that is grandiose, inhuman and uninspiring. Academic detachment cuts us off from experience and prevents us influencing events.
- KIPLING: Ere Chil the Kite swoops down a furlong sheer,
- KIPLING: Through the Jungle very softly flits a Shadow and a sigh -
- THE SUN: Woman Power, predicts Mr. Kellen, will free men as well as women. It will create an entirely new life style - the Partnership Society - which both men and women will eventually enjoy.
- BUCHAREST: The potential dangers of manipulation through the media.....
- ME: This news story from a popular paper shows a change in public consciousness. "Superman has had his day" is closer to the spirit of our times than is our slogan "the Humanization of Man".
- THE SUN: Certainly a man will no longer have a vice-like grip on a woman's life, confining her to the home, denying her equal pay or opportunity if she does work, refusing to reveal his income, making himself master of her body.
- KIPLING: He is Fear, O Little Hunter, he is Fear!
- THE SUN: Woman is not just tired of serving man. She is particularly tired of serving modern man, says Mr. Kellen.
- BUCKINGHAMSHIRE: ITS TOO HOT IN THE HUT.
- ME: Fifteen years ago I had a grand plan for eliminating traffic congestion, road accidents, and parking problems by gradual automation of traffic control. It was ignored. I now

think that the abstract language in which the plan was phrased removed the possibility of its inspiring anyone to try it out. Another difficulty is that traffic automation requires changes in consciousness.

ME: What is the effect of futures research: to assist social change or to inhibit it? Both, I guess. In either case it is tempting to look only to the imagined past or future while ignoring the present, the only reality.

ME: The term "post-industrial" is misleading. It can mean a hopeful change to a less oppressive way of life that is free of contradiction, bureaucracy, specialisation and the like. It can also mean a super-industrial life more oppressive and more organised than at present.

ME: Although I set out to question the use of objective language in futures research, I find myself writing objectively in these paragraphs. Why is this? Is this because the future is itself an abstract idea?

BUCKINGHAMSHIRE: THE RIVER BENDS.

KIPLING: Very softly down the glade runs a waiting, watching shade,

THE SUN: A man who slogs for 20 years to become boss of his firm, and begins - from the day he is promoted - to be pushed out again, either by a younger man or a heart attack, is not an ideal partner for any woman.

THE SUN: It is one thing to be carried across the threshold of a castle by a romantic knight. And quite another to share a home with a pill-swallowing, nervous wreck, who is always overtired, nervous, suspicious, eats and drinks too much, and is a selfish and unsatisfying lover.

BUCHAREST: Is communication reinforcement of the status quo or how may it serve as a force of change,.....

ME: Many of the T.V. programmes entered for the Prix Futura in Berlin were dismal variations of Brave New World or 1984. Marshall McLuhan states that modern art is the best source of accurate visions of the future.

BUCHAREST: The social and organizational structures required for communication to promote participation in a changing society.

BUCKINGHAMSHIRE: THE RUSTLE OF GRASS

BUCKINGHAMSHIRE: THE SOIL OF BUCKINGHAMSHIRE.

THE SUN: Women expect equality at every level of society, from the Cabinet to the kitchen, from the boardroom to the bedroom.

BUCHAREST: .....the importance of communication as a tool for society to overcome internal cleavages and differences.

BUCHAREST: .....improvement of communication among people who hold different values, are of different cultures and adhere to different ideologies, are of different social and semantic backgrounds.

BUCHAREST: Establishment of mutual awareness, understanding and co-operation among different intellectual and academic disciplines, and specialists involved in shaping the future of man as a whole.

BUCHAREST: ....the dangers and shortcomings of present communication systems and practices.

BUCHAREST: ....information which is vitally required for making decisions and taking a position concerning the future is withheld from the public....

BUCHAREST: Governments and corporations which are responsible for some of the best future studies are not releasing them since they recognise that foreknowledge is power.

KIPLING: And the whisper spreads and widens far and near.

BUCKINGHAMSHIRE: A WOODEN POST.

BUCHAREST: Restriction of information, and a patronizing attitude which discourages the public to feed back views and reactions, is due to wide-spread fear that information may challenge present structures and policies.

THE SUN: Women in politics will have a soothing influence.

KIPLING: And the sweat is on thy brow, for he passes even now-

BUCHAREST: .....can there be a constructive future, and future research, under conditions of fear?

THE SUN: They will be more serious and honest with voters. And they will not waste public



money as barbarously as billion-spending politicians brainwashed into thinking that, except for force, money is the answer to everything.

BUCHAREST: Why are authorities afraid of divergent opinions among the people.....

BUCHAREST: ....initiatives to promote critical examination of key issues among the people might be "subversive" to existing political, social and cultural patterns.

BUCHAREST: ....the trend of the world is only toward concentration into relatively few monocultures but also, and perhaps preponderantly, towards diversification, heterogeneity, and personal or group identity.

BUCHAREST: The use of power, it was realised, is basic to the function of communication in society and the opportunities for participation.

THE SUN: Marriage and family life will thrive as never before in the 1980s. The, marriage - divorce - remarriage cycle, and the agony it brings, will vanish.

KIPLING: He is Fear, O Little Hunter, he is Fear!

THE SUN: Because changing sexual attitudes - less hypocritical, less inhibited - will strengthen families. Couples will be freer, but will have a more mature approach to life and loving.

KIPLING: Ere the Moon has climbed the mountain, ere the rocks are ribbed with light,

BUCHAREST: Fear, above all, stands in the way to advancing toward full participation in communication.

BUCKINGHAMSHIRE: HAIR IN MY EYES.

THE SUN: Men and women will select better mates, because they will see each other not as Moon-in-June dream figures, but for what they really are.

KIPLING: When the downward-dipping tails are dank and drear;

KIPLING: Comes a breathing hard behind thee - snuffle-snuffle through the night -

BUCKINGHAMSHIRE: STONY GROUND.

BUCKINGHAMSHIRE: WONDERLOAF.

KIPLING: It is, Fear, O Little Hunter, it is Fear!

THE SUN: Men and women from a sex point of view, will be less tense with themselves and each other. As they function more normally, frigidity will decline and the result will be more rewarding sex lives.

BUCKINGHAMSHIRE: A BRICK.

KIPLING: On they knees and draw the bow; bid the shrilling arrow go;

KIPLING: In the empty, mocking thicket plunge the spear!

THE SUN: Men's contradictory fantasies about woman as, on the one hand, the angel, the mother, the Madonna, and on the other as the slut, the bitch, will give way to a less romantic, less evil conception.

KIPLING: But thy hands are loosed and weak, and the blood has left they cheek -

BUCHAREST: ..... "the only thing to fear is fear itself".....

THE SUN: Woman Power will, in fact, make women REAL to themselves, as well as to men.

BUCKINGHAMSHIRE: EXAMINATION ATTENDANCE MARKS SHEET.

BUCKINGHAMSHIRE: TO BE COMPLETED BY THE SCRIPT MARKER.

THE SUN: Once men begin to live like men - instead of supermen - there is hope for us all.

KIPLING: When the heat-cloud sucks the tempest, when the slivered pine trees fall,

KIPLING: When the blinding, blaring rain-squalls lash and veer,

KIPLING: Through the war-gongs of the thunder rings a voice more loud than all -

BUCKINGHAMSHIRE: SEWERS

KIPLING: It is Fear, O Little Hunter, it is Fear!

BUCKINGHAMSHIRE: THE NETTLES STING MY BARE FEET.

KIPLING: Now the spates are banked and deep; now the footless boulders leap -

KIPLING: Now the lightning shows each littlest leaf-rib clear -

KIPLING: But thy throat is shut and dried, and thy heart against thy side

BUCKINGHAMSHIRE: A BRIDGE

KIPLING: Hammers: Fear, O Little Hunter - this is Fear!

METHODS IN OBTAINING INPUT FROM GRASS-ROOTS

By Magoroh Maruyama  
Anthropologist

In the following pages I discuss the distortions which take place when the usual data collection methods developed for middle-class populations are used in non-middle-class communities.

Distortions in Social Data Collection

The nature of transducers involved in social data collection is different from that found in the transmission of "information" as formulated by Shannon.

In the Shannonian formulation, data collection may be conceptualized as "information" being transmitted from objects via some media to measuring instruments, and then to a coding and registering device. In such a system, "distortions" or "errors" are due to "noise", overload beyond "channel capacity", inaccuracy of the measuring instruments, or inadequacy of the coding and registering devices.

In social data collection, however, other types of distortions affect the data much more than the distortions due to noise, overloading or inaccuracy. The distortions in the Shannonian formulation may be called "information distortions". The other types of distortions, which we will discuss in this paper, may be called "meta-informational distortions".

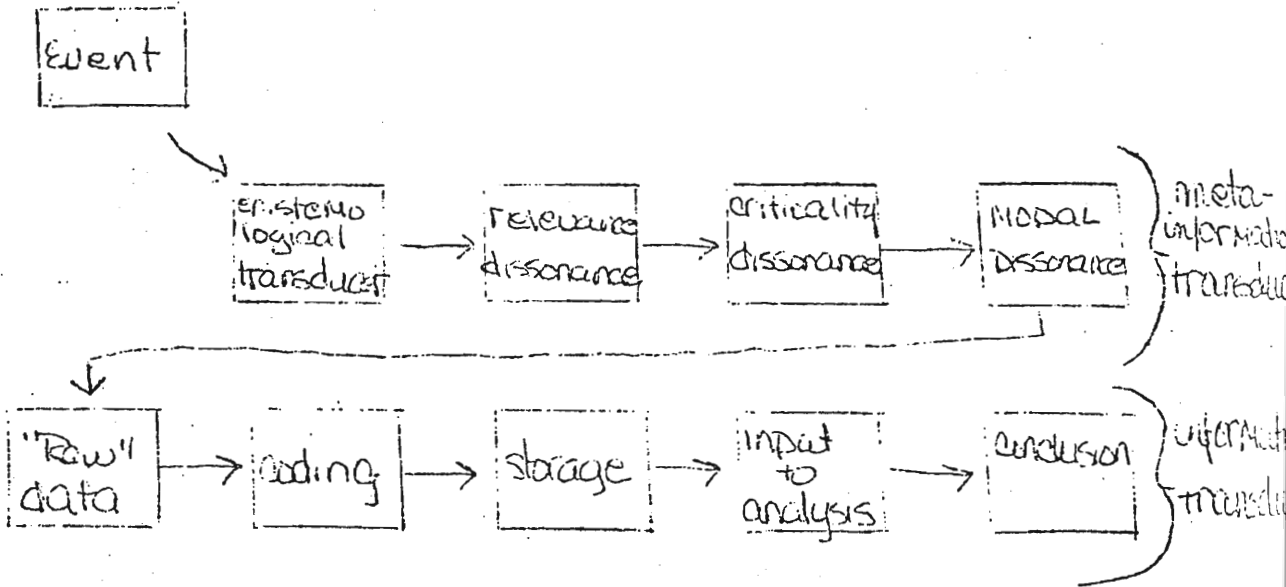
Often meta-informational distortions are overlooked while meticulous care is taken in minimizing informational distortions. In such cases the whole effort may be wasted.

Meta-informational distortions may be conceptually subdivided into the following components:

- a. cross-epistemological distortions: "Receiver" is unaware that the "transmitter" of the message lives in a universe epistemologically different from that of the receiver. The receiver interprets the message in terms of his own epistemology, not that of the transmitter.
- b. relevance dissonance: The transmitter (for example the interviewee) perceives the purpose of the message-seeker (for example the interviewer) as irrelevant to the former's own purpose. The transmitter feels exploited by the message-seeker's purpose. The transmitter may give phony "information" to keep the receiver happy and away, or he may counter-exploit the receiver.
- c. criticality dissonance: The transmitter knows that the receiver is unaware that the information, if leaked, may bring harm to the transmitter. The transmitter knows that the receiver is naive regarding the danger of the information, and he fears that the receiver may unwittingly and unsuspectingly pass the information to a wrong party. The transmitter therefore protects himself by giving phony information to the receiver.
- d. modal dissonance: The modes of communication are culturally different between the transmitter and the receiver. Therefore the receiver mis-decodes the transmitter.

(a) and (d) are unintentional distortions. (b) and (c) are distortions intended by the transmitter, devised not to be suspected by the receiver.

Conceptually we can visualize the set of these metainformational distortions as four transducers connected in series:



Some of the four meta-informational transducers may be inactive in many cases.

Cross-epistemological distortions

There are several types of epistemologies in the world as well as in our own society. For example, the Greek/European/White-American epistemology is mainly characterized by the logic of unidirectional deduction and exclusion, ontology of substance and objects, "science" structured upon categories, hierarchies and unidirectional causality, ethics of right and wrong, theology of monotheistic, infinite (i.e. "larger than anything else" in theological conceptualization), "most" perfect, omnipotent and omniscient prime mover, and philosophy compelled toward discovery of "universals" and unique "truth".

On the other hand, the Navajo epistemology is characterized by nonhierarchical mutuality and harmony; the Chinese epistemology by complementarity and lack of ontology of substance; and the Japanese epistemology by situational interpretation of events, multiplicity of meanings and polyocularity.

Interestingly, contemporary science is moving away from classical "science" based on substance, categories, hierarchies and unidirectional causality. Mutual causal relations, particularly systems of equilibrium by means of deviation counteracting feedback, and systems of diversification, differentiation and growth of complexity by means of deviation-amplifying feedback, have been recognized and applied in electronics, ecology, embryology, genetics and other fields of science, not to mention the change in the notion of substance since quantum theory and the theory of relativity.

Distortions occur when the epistemology of the researcher differs from that of the culture under study. For example, a researcher whose epistemology is based on a rank-order structure may reduce and deform by his use of rank-order value system analysis, O-sort technique or "leadership" structure analysis an alien culture whose epistemology is essentially nonhierarchical. Or a researcher whose epistemology is classificational may distort, by his use of psycholinguistic category analysis, a culture whose epistemology is essentially relational. Another example is a researcher who tries to apply the assumption that behavior is motivated by desire for acceptance by peers, to a culture in which behavior is governed by the necessity to defend oneself physically against his peers. Interpretation of one epistemological universe by a researcher from outside may produce a theory which is self-consistent and is therefore satisfactory to the researcher, but nevertheless is incorrect or irrelevant from the point of view of the universe being interpreted.

On the side of implementation, imposition of an outside epistemology upon some cultures have produced disruptions in them; Requirement of hierarchical structure (formation of "tribal council", "incorporated town", etc.) by government upon nonhierarchical cultures such as Navajo, Eskimo and Aleuts have resulted in artificiality, and in some cases frictions, within the communities. Some community action programs have failed for the same reason. Imposition of an outside epistemology upon a culture tends to put cultural deviants into power.

#### Relevance dissonance

In the white middle class environment, data collection is generally accepted as a tool for direct or indirect improvement



of the life of people from whom the data are collected. The purpose of data collection as perceived by the people coincides with their own purpose. There is relevance resonance between the data collection and the people. This is not the case with some other environments. When the people perceive the purpose of the data collection as irrelevant to or even harmful to themselves, they may give phony information or may attempt to counter-manipulate or counter-exploit the data-collection project. Often the researcher is convinced that his research is useful for the people, and people can contrive ways to make him believe so, while at the same time feeding him phony information.

Let me illustrate this with examples.

#### Example 1, ghettos and prisons

Prison inmates and ghetto residents are often interviewed by newspaper reporters, magazine writers, student interns, sociologists, criminologists and psychologists. Each of these interviewers comes with a certain purpose which, in the perception of the interviewees, is often irrelevant. The most frequent purposes of the interviewers as perceived by these interviewees:

Journalists and writers: to write articles which will sell, i.e. to make money; to reinforce what the public wants to believe; to manipulate the climate of opinion for a political, economic or business advantage; to advocate writer's own point of view; to help the "power structure" in imposing its distorted reality upon the public.

Student interns: to earn certificates, academic credits, do-gooder status or "professional" status of having worked with the "poor" or "criminals".

Academic researchers: to test academic hypotheses and to perpetuate academic theories which are blind to what is actually relevant in real situations; to produce publications as a tool for recognition, reputation and promotion; or simply to earn a living from the research salary.

The interviewees, on the other hand, want the interviews to accomplish the following purposes:

- (1) to make the public aware of the living and working conditions, physical and mental abuses and some inadequate or arbitrary procedures which often fall far below what the public is made to believe.
- (2) to make the society see, from an inside perspective, the conditions of the environments which produce poverty or crimes.
- (3) If the interviewer is suffering under specific injustice or abusive practice, to open a channel for rectifying the injustice.
- (4) To improve through public pressure the often substandard vocational and educational programs.
- (5) To express their feelings and opinions which they think are entitled to be heard by the public.

As will be discussed under "criticality dissonance", an information leakage in a ghetto or a prison may become a matter of life and death. Ghetto residents and prison inmates therefore have a very sophisticated complex technique of giving phony information, tailored to each specific type of interviewer, which satisfied the interviewer and at the same time protects the inmates. Inmates are quite often versed in sociology, psychology and psychiatry, and know how to fool professional researchers. One of the standard

games the inmates play with the prison psychiatrist is to manufacture symptoms of severe mental disturbance, play them out before the psychiatrist, and reduce them gradually in order to get a report of "improvement".

The interviewees detect relevance dissonance in several ways:

(a) noticing an instrumentalizing attitude in the interviewer; (b) giving reaction tests to the interviewer; and (c) observation of the interviewer's action before and after the interview.

Instrumentalizing attitude of the interviewer manifests itself in one or several of the following ways:

- (1) Using pre-set tests or pre-set questions which do not accommodate what the interviewer really wants to communicate.
- (2) Considering the interviewee as a response machine without allowing interchange or independent contribution.
- (3) Considering the interviewee as a statistical or clinical object.
- (4) Relying heavily on "official records" of the interviewer, attributing more validity to official records than to the interviewee himself.
- (5) Building his knowledge on books and theories, even though he is unacquainted with real situations.
- (6) Posing himself as an "expert" while discrediting the interviewee's experience and insight as "unscientific".
- (7) Distrustful of the interviewee.
- (8) Insensitive to, unresponsive to or unaware of the interviewee's feelings.
- (9) Lack of interest in or desire to know the interviewee's point of view and concern.
- (10) Evasive in expressing his own points of view, attitudes, feelings and goals.

- (11) Aloofness.
- (12) Patronizing or condescending attitudes.
- (13) Naivety regarding the way the police, the social workers, etc. operate.
- (14) Apathy or lack of cause, involvement and commitment.

The reaction test consists in (1) value test; and (2) click-in test. In the value test, the interviewee drops hints and observes the reaction of the interviewer in order to detect the interviewer's value orientation. In the click-in test, the interviewee mentions some topic casually to see whether the interviewer catches its relevance and picks up the topic or remains unaffected by the topic. Examples of such topics are: police harassment, court-appointed attorney, school teachers, store owners, genocide.

The action observation method consists in seeing whether the interviewer puts in action what he promises or advocates; how promptly and energetically he does so; and how skillful he is in maneuvering through obstacles.

Example 2, American Indians (Native Americans)

In most of the American Indians' perception, the purpose of too many anthropological researches is usually to benefit the academic community or the museum, or to satisfy the researcher's curiosity or vocational drive, or to contribute to the researcher's reputation or promotion, or simply to produce salaries for the researchers. Indians see the researchers as leading an extravagant (by Indians' standards) life made possible by the research salary. In this sense the researchers are exploiters. Even the medical and educational researchers are often suspected, because the white man's philosophy of medicine and education is built on assumptions, values, goals and epistemologies incongruent with many aspects of the Indian cultures.

In addition, the historical context of government administration contributed toward Indians' resentment toward the researcher. There are numerous surveys and researches conducted by the government which have produced no visible benefits relevant to the Indian Way while creating highly paid positions for the administrators of new programs which grew out of the research findings. Some of the programs resulting from researches, politically manipulated, have produced detrimental effects on Indians, for example the livestock reduction program on the Navajo Reservation.

When the real or perceived purpose of the researcher is incongruent with the purpose desired by inculture persons, the people under study tend to give restrained or disguised information. This may occur even when the researcher intends to be "helpful" to the inculture persons. For example, in health surveys, the interviewees may hide their illness because of fear of hospitalization, if the hospital life contains elements which conflict with their ethical and religious views or with their cultural practices. The interviewees may hide the number of their children because of the fear that the children may be taken away to boarding schools. They may hide the size of their livestock because of the fear for livestock reduction programs. Some questions may be simply irrelevant, for example the questions regarding plumbing and kitchen facilities, as in 1970 census, asked on the Navajo reservation. Relevance-dissonant or irrelevant questions tend to produce phony answers. Even if a survey contains some relevance-resonant question, if there are too many relevance-dissonant or irrelevant questions the whole survey may be perceived as relevance-dissonant or irrelevant. The researcher may remain unaware of it throughout his research.

In order to attain relevance resonance, the researcher needs to make his purpose converge to the purpose of inculture persons. He must not attempt to make their purpose converge to his. The purpose of inculture persons must be the ones that are expressed by the inculture persons themselves, not the ones that the outsider assumes to be the purpose of the inculture persons. One must also be aware that the inculture persons may express phony purposes if they perceive the researcher from outside as relevance-dissonant or irrelevant. The researcher must first become relevant. (This topic will take another paper to discuss).

Criticality dissonance. The life in certain environments involves several types of dangers which are unknown to the middle class and are therefore unsuspected by and disbelieved by the researcher from middle class background. The interviewee, who is aware that the researcher is unaware of the danger, fears that the researcher may unsuspectingly let the data leak to what the researcher assumes to be a safe place. In such cases the interviewee gives phony data to the researcher for the purpose of self-protection, not necessarily for the purpose of deception. Such distortion of data due to the awareness of discrepancy in the knowledge of danger is called "distortion due to criticality dissonance".

The dangers which the inculture persons fear may come either (1) from persons connected with the authority system imposed from outside; or (2) inculture members of the community.

In both cases, the existence of the primary danger sources can be used as a leverage by those who manipulate the fear of the primary danger sources. These manipulators are the secondary danger sources. The term "secondary" does not mean "less dangerous". In fact, the secondary danger sources may be as deadly as or deadlier than the primary danger sources. Then there are those who manipulate

the fear of the secondary danger sources. These are the tertiary danger sources. To be more specific:

Primary danger sources: prison guards, policemen, thieves, money collectors, murderers, livestock reduction agents, etc.

Secondary danger sources: snitches (finks, informers) who give real or purposefully fictitious information to the primary danger sources for the purpose of having the primary danger sources strike the informers' enemy, rivals or for the purpose of being rewarded by the primary danger sources.

Tertiary danger sources: counterspies, snitch-killers, false-jacketers (Those who label an innocent man as a snitch in order to have him killed by snitch-killers).

Fourth level danger sources: the false-jacketed (who must retaliate and kill the man whom he believes to be his false-jacketer), detectors of false-jacketers, etc.

#### Example, Ghetto

There are two sources of danger in the ghetto: other ghetto residents, and those who have legal power such as policemen, probation and parole officers, social workers and shop keepers.

#### Danger from other residents.

Fist, knife or gun fights may result from unpaid debts, insult, challenge to manhood, gambling, theft or simply from accumulated frustration. A materially insignificant matter may have serious implications. For example, if someone owes you one dollar and refuses to repay, he may be testing you to see how far he can take advantage of you or can ignore your existence. If he gets away with one dollar this time, he will try you for ten dollars next time. You must get the one dollar back, even with a gun. The ghetto residents do not get much protective service from the

police. A crime committed by one person against another in the ghetto is usually settled by a direct retaliation.

Information to be hidden from neighbors.

Place of work: An illustrative example: A woman worked as a secretary at the City Hall during daytime. Since the income was insufficient to support her family, she worked as a prostitute in the evening. A neighbor, who wanted to get a job at the city hall, told the City Hall that the woman was a prostitute. The woman lost her job, and the neighbor got the job. In this case it was dangerous to let her neighbors know of her place of daytime work. It was also dangerous to let the City Hall know of her place of work in the evening.

Working hours, hours of absence from home. This information may be used by thieves. The ghetto resident often leaves the radio or a lamp on while absent, in order to give the impression that someone is home.

Possession of small, handy appliances such as a toaster, coffee maker, iron, or a small stereo set. These items attract thieves. The ghetto residents prefer to have a bulky stereo set which can be nailed to the wall in order to avoid theft.

Money on hand, wins and losses in gambling. This information may be used to pressure repayments of debts, making new loans, refusing new loans etc.

Danger from legal authorities: As in prison, the ghetto residents experience much harassment and abuse from some of the policemen, probation and parole officers. Furthermore, some policemen may receive bribes from gambling places, narcotic dealers and pimps.



They may "confiscate" into their own pockets, on the ground of suspicion, possessions or cash which ghetto residents have earned legally. Social workers may practice favoritism in exchange for sex.

Example: A youth, who worked at a gas station, was standing on the street on an off-duty day. He had just been paid \$130 the day before, and had the cash in his pocket. A police car came by and slowed down. The policeman shouted: "Hey, Nigger, why aren't you working". The policeman stepped out of the car, ordered the youth to stand against a wall, and searched his pockets. The policeman found \$130 and told the youth: "Punk, I know you couldn't have gotten this much cash unless you stole it. Well, I will let you get away easy this time. I will give you \$20 back. Make sure you keep your black mouth shut." The policeman kept \$110 to himself.

Example: One of our inculture researchers asked a friend of his to bring a taperecorder by car to an interview place. The taperecorder belonged to our project. A policeman stopped the friend's car, found the taperecorder and confiscated it on the ground that the man had no "proof of purchase" with him.

As in the prison, there are harassments and abuses which contain a message and provocation. There is an additional consideration in the ghetto which does not exist in the prison. It is loss of present and future employment due to arrests or confiscation without proof of guilt. Many ghetto residents are arrested simply because they resemble someone wanted by the police. Ghetto residents can seldom afford a bail. Detention on the ground of suspicion or impounding of a car causes loss of job. Moreover, the "arrest" record will handicap a person in obtaining future employment even if he has been proved not guilty.

There are also unreasonable regulations which can be used as a tool for harassment by those who have authority. For example, regulations may require that a parolee cannot associate with another parolee, a prostitute or a member of "radical" organizations. A parolee, who has no choice but to live in a ghetto, cannot avoid running into other parolees, prostitutes or members of "radical" organizations. Usually violations of these regulations are tolerated, but they can be used for harassment by a parole officer who has a personal dislike toward certain parolees.

Information to be hidden from the police

Place of employment: The police often come to arrest a person at the place of his work. The employer, seeing the visible arrest which creates an embarrassing image for his business, may fire him, or a detention of a few days may cause the detained person to lose his job even if he is later found not guilty. The ghetto employment is seldom permanent. When an employee is absent, the employer hires another person.

Home address, names of friends and relatives, and location of hang-out places: Used by the police for arrest.

Possession of guns: Necessary for self-defense, but technically illegal.

Selling of narcotics, gambling. These may be indispensable for income, but are technically illegal.

Information to be hidden from the social worker

Employment: Until recent revisions, unemployment was usually a requirement for welfare eligibility. Underemployed persons needed welfare yet had to keep the employment secret to the social worker.

Presence of husband or boyfriend. Often absence of husband was a requirement for welfare eligibility. Presence of a male visitor may be misinterpreted by the social worker and make the recipient ineligible.

Information to be hidden from census takers, survey researchers, sociological interviewers, etc.

Name, address, place of work, working hours, marital status, age:

As we have seen, these are highly dangerous information which the ghetto residents would not easily give even to their own neighbors. They have no reason to give this information to anyone unless they see some advantage which overweighs the danger. The level of danger is much higher than the outsiders can imagine, and what the outsiders conceive as advantages for the ghetto may not be advantages at all from the point of view of the ghetto residents. Even if some concrete benefits are promised, they are usually very slow in materializing, to the extent of making the promises appear empty. The assumption that the ghetto residents would cooperate with the data collection and give "true" data is often erroneous.

Housing conditions, plumbing, etc. The ghetto residents have had enough of bad experiences in urban renewal, in which they were evacuated and displaced, and unable to pay the "low cost housing" and thus unable to find any place to live. They fear that their buildings may be condemned and they would lose a place to live in. The 1970 census intended to survey housing conditions, but this type of survey would get false information from where such information is mostly needed

Example 2, Navajo Reservation

Between 1934 and 1943 the U.S. Government instituted a "Livestock Reduction Program" which destroyed more than one half of animals owned by Navajos. The purpose of the program, supposedly, was to prevent overgrazing of land. But many cases are known in which the animals, taken away from Navajos, were given to white traders who kept grazing the same animals on the land of Navajos. The political pressure from the white livestockmen in Southwestern States who feared the competition from Navajos was partly responsible for the creation of the program. As a result of the program, a great percentage of the Navajos were impoverished and could not recover economically for many years. Even now the Navajos are reluctant to reveal the number of animals they possess to visitors from outside. Many Navajos also fear the compulsory internship of their children into the government boarding schools, and tend to conceal the existence of their children.

Modal dissonance

Another type of meta-informational distortion is modal dissonance. This can occur in three ways: (1) mismatching of philosophy regarding communication; (2) mismatching of logical modes of communication; (3) mismatching of social modes of communication.

An example for the first is the difference between Danes and Swedes. In Sweden, the main purpose of usual interpersonal communication is transmission of facts. In Denmark, on the other hand, the main purpose of usual interpersonal communication is perpetuation of the familiar, Swedes strive for factual interest and objective accuracy, while Danes cultivate the art of not hurting anybody's

and one's own feelings. In Denmark, question-asking and expression of knowledge or feelings are considered aggressive and are avoided as much as possible except in very specific situations. Factual questions, even on impersonal matters, are impolite because they may reveal someone's ignorance who cannot answer the questions. Explanations are also impolite because they assume that someone is ignorant enough to need an explanation. Factual discussions are avoided in most cases because a disagreement implies that someone is wrong. Only on arts, literature, music and other subjective topics can one disagree without embarrassment. There is a feeling that subjective interests are nature while objective interests are immature. Because the direct expressions of strong feelings are avoided, the Danes cultivate psychological projection, introspection, subjective interpretation and the art of guessing one another's feelings.

When Danes and Swedes communicate, Danes tend to over-read meanings in Swedes, and Swede's efforts to be polite by factual communication tends to appear to be impolite or aggressive to Danes.

The second type of modal dissonance occurs in mismatching of logical modes. For example, in Persia unpleasant information is phrased in pleasant terms. This is not deception, because the sender expects the receiver to "decode" the message. However, outsiders may not know how to decode the message and feel deceived, and consider Persians as liars. On the other hand, Persians may "decode" in the Persian mode the "straight" message from outsiders, and after discovering the discrepancy between the outsiders' behavior and the "decoded" message from them, the Persians may decide that the outsiders are liars.

The third type, mismatching of social modes, can be illustrated by taking American Indians as an example: Most of the American Indians do not respond either to interviews or to mailed questionnaires, simply because this mode of communication is socially impossible.

An American Indian, who wants to obtain information from another American Indian, must proceed as follows. First, he obtains some personal intermediary. Let us say X wants to interview Y. X first tries to find someone Z who knows Y. X may ask Z to introduce him to Y, or X may show up to Y's place and say that X came because he has heard about Y from Z. Then he will talk with Y for a few hours just to get acquainted. He will return to Y again a week or two later, and talk with him more, still casually,, to get acquainted better. He will continue this process for a few times, and when they have gotten acquainted with each other, he gradually asks a few questions, not too many at a time. It will take him several visits to ask all the questions.

It is unthinkable for an American Indian to send a questionnaire to another American Indian. It is simply impossible to send a questionnaire to an unacquainted Indian, and it is an insult to send a questionnaire to a friend. You must visit a friend.

An American Indian would throw away the questionnaires sent to him; Most of the questionnaires come from white men and he considers them as irrelevant; and American Indians would not send out questionnaires. (There were some instances, however, in which American Indian Organizations did send out questionnaires. It turned out that many of those who received the questionnaires threw them away.)

### Example 3, Prison

(a) danger from other inmates: The prison life is characterized by extreme scarcity of things and occasions which fulfill basic human needs. These needs range from material needs such as cigarettes and toothpaste, physical needs of sex, to emotional needs such as opportunity for expression of manhood, proof of one's own worth to himself, recognition by others, autonomy and privacy. Therefore a conflict over one pack of cigarettes, one small insult or inadvertent physical contact may lead to physical fights and murder. In the prison project the inmate researchers listed sixty-four categories of the "interpersonal factor" plus numerous other categories of the institutional and situational factors contributing to physical fights. Here are excerpts from some of the categories of the interpersonal factor: Collector: Example: Z loans Y one carton of cigarettes for two weeks at 100 percent interest rate (repay the double). After two weeks Y is unable to pay. Z raises the interest rate to 200 percent and hires X to collect for 50 percent fee. Y is still unable to pay, or refuses to pay. X stabs Y.

Teach lesson: Example: X loans Y some shaving cream. The next morning Y takes some shaving cream without asking X. X hits Y to teach him to always ask.

### (b) Danger from prison guards:

There are two forms of danger from prison guards; harassment and abuse. Harassment is hostile behavior within legal limits or with a legal pretext on the part of the guards. Abuse is illegal hostile behavior such as physical assault or denial of medical care. Let us emphasize that there are individual differences among prison

guards. Some are calm. Others have tempers. Some are fair. Others are sadistic. Some are respected by inmates, others are despised. Not all guards practice harassment or abuse. But what is relevant in the inmate life is that there are harassments and abuses which become the source of a realistic fear.

Harassment and abuse have three functions: message, harm, and provocation. The message is : "I hate you. I am doing this to you because I hate you. You hate me but you cannot do anything to me". The harm may be physical or otherwise: beating, shooting, suspension of a privilege, denial of a legal right, destruction of personal belongings, inconveniences, etc. Provocation has the purpose of inciting a hostile attitude in inmates to rationalize the guard's abuse which follows the provocation.

The direct harm may be negligible as compared to the message it intends to communicate and to the provocation it intends to create. The message and the provocation, much more than harm, create resentment and tension. Outsiders tend to see only the direct harm without realizing the message, and provocation and the resulting tension. This is why the outsiders are unaware of or inappreciative of the fear and the indignation in the prison inmates. Examples of harassments are:

Shaking down: The guard stops the inmate and searches his pockets, etc. Probably message: "You are on the black list. Better be careful, or you will get busted."

Strip down: The guard orders the inmate to get completely undressed. This is usually done in full view of the prison population. Then the guard orders: "Pull up your balls (testicles)", "Spread your ass (rectum)" etc. The guard as well as the inmate and the onlookers know that there is nothing hidden under the testicles or in the



rectum. Message: "I hate you especially. This is why I am humiliating you in front of everybody."

Cell search: The cell of an inmate may be searched for legitimate reasons such as a check on narcotics or knives. But a cell search may be done for harassment. The search "squad" may cut up the bed mattress, tear the seams of clothes, slit the toothpaste tube, and scatter the family photos or the religious symbols on the floor. The family photos or the religious symbols are often the inmate's only means to maintain his tie with his family or to remind him that he is an individual, not a number. If the squad drops these objects on the floor, the inmate feels as if his whole family or his whole individuality is slaughtered.

Cigarettes and toothpastes are purchased by the inmate at the canteen. If they are destroyed, it becomes a net loss. The inmate may owe some cigarettes to another inmate. If he is unable to repay, he may get stabbed. Clothes are "issue items", but the inmate is made responsible for their maintenance. The trousers and the jackets are stamped with the inmate's ID number. Though the uniform is the same, many inmates express their individuality by having their shoes shined and the trousers pressed and creased by inmates who work in the laundry, etc., paying them in cigarettes. If these clothes are destroyed, the inmate loses his pride in individuality as well as cigarettes which function as money.

A vicious variation of cell search is a "planted" violation. While the inmate is away from his cell, a guard places some illegal item in the inmate's cell. The guard then calls the squad to raid the cell. This is one of the ways the guard can get a clean inmate busted.

Information to be hidden from other inmates:

amount of cigarettes one possesses: Cigarettes function as money in the prisons. If it is known that an inmate has many cigarettes, he may be pressured to repay his debts, to make loans to someone or to engage in wheeling and dealism as a partner. Or if it becomes known that his supply is depleted, his bluffing and bargaining power decreases.

amount of other items in possession: to prevent theft, this information should be kept secret.

amount of debts: If this is known, one may become victim to loan sharks, or someone may offer financial help or physical protection from debt collectors in exchange for homosexual acts.

payment to protector: If it is known that an inmate is paying someone for physical protection from enemy, others may offer this service for less fee, and this is likely to result in violence among protectors.

Other types of information such as amount of gambling gain or plot against other inmates should be kept secret.

Information to be hidden from the guards. There are reasonable as well as unreasonable regulations. The inmate may violate regulations for good or bad purposes. Inmates protect one another from punishment, harassment and abuse. An inmate would rather suffer a false accusation by guards than to disclose another inmate's hidden facts.

Information against guards and prison authority: Inmates who expose to outsiders the "irregularities" practiced by the prison staff are retaliated against by the guards and the staff. They may be punished or subjected to greater harassments and abuses. Their release may be postponed.

Inmates have good reasons to suspect that the information given to researchers can fall into the wrong hands. The researchers may make their best efforts to keep the data confidential. But they may be unaware of all the dangers of information and all the complex channels of information leakage, and may unwittingly pass information to someone who may snitch or slip. An inmate has no reason to give any information to anybody unless there is a very worthwhile cause for which he is willing to risk the danger which may result from the information-giving, and unless there is an evidence (promise is not enough) of absolute confidentiality. "Isotope test" is a frequently used technique. First the inmate gives a person a very safe information or fictitious information, and observes where it will leak, just as an isotope is used to trace the path of materials in the body of an organism. If no leakage is found after several days, the inmate will give the person an additional dose of slightly more dangerous information and observes the results. The process is repeated. If at any stage there is an indication that the information has leaked to the wrong sides, the inmate will from there on give phony information to the person. If information leakage occurs, not only the researchers but also the interviewees become suspected as snitches, and they may risk physical danger, even death.

RUMOR-MONGERING IN KENYA:  
A CASE OF SELF-AMPLIFYING SYSTEM

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Rumor-mongering as a form of communication has been one of the serious concerns of the Kenya political system since the independence. This system of communication seems to have had exponential growth with consequences that other channels of communicating public truth seem to have been thoroughly impaired. In many conversations of Kenyans the question 'what is the latest one?' meaning (rumor) is a very common expression. What this common behaviour implies fundamentally, will have to wait for more research. Anyway the allegers and allegees of rumor-mongering seem to cut across all the sections of Kenya's civil and political hierarchies and oligarchies. In a majority of cases it is the Wananchi who are accused of this 'malicious crime' but occasionally the policy-makers are also accused of engaging in this vice. To the Kenya's political strategists, (those who guide the affairs of State) rumor-mongering is an activity designed by those disgruntled subversive and seditious elements in the country to confuse and mislead the masses. Moreover, these dissident elements accuse <sup>the</sup> government for having done nothing for the Wananchi except a creation of lop-sided development which benefits a certain class of individuals well-placed in Kenyan social system. On the other hand, allegees claim many of those privileged individuals played an insignificant role in the nationalist activities of the past. Some of them in fact collaborated with colonial rule to suppress genuine African nationalism. These accusations and counter-accusations lead government to consider all rumors a threat to the national security and one can be imprisoned for it under treasonous activity. The following selection, going back to early years of independence, attempts to review the nature and the growth of this self-amplifying communication. After the

selection an effort is made to interpret the problem along the lines of self-amplifying systems, public truth and symbiotizing logics, etc.

As mentioned earlier, rumor communication is considered seditious and subversive activities by those who man the country's security. As early as in 1964 just a year after independence allegation and counter-allegations of political 'power struggle' starts the 'initial rumor kick' - warning to rumor mongers  
Minister denies seeking power:

"K.A.N.U. Vice President, Mr. Odinga denied at the weekend the allegation which he said was made by imperialists that he wanted to seize power from the Prime Minister, Mr. Kenyatta .....addressing a rally attended by several thousand people at Kangundo in Machakos District, the Minister who was accompanied by Mr. Ngei said that the allegation was "all false and rubbish".....African seized power from imperialist who had been ruling Kenya for a long time sucking our country, but I would not like to seize power from Africans" (E.A.S. 13.7.64).

As one can see from the quotation, the context of rumor in this case surrounds the issue of political power struggle in the initial years of independence. Immediately after independence nationalist functions attempted, under various party groups, to

steer the country into various 'power poles' of the world. No one was quite explicit at that time on how to go about it. Consequently their philosophical and ideological sentiments were swallowed by system of information distortion. It seems at that time the nationalists were presumably under certain foreign influences of the main political power-blocks. The innuendos of these relationship formed the substance of information distortion.

"Diplomats warned on subversion". If diplomats tried to divide Africans in Kenya they would be expelled like the former Assistant Commissioner of Police, Mr. Pridgeon.....Mr. Moss told a K.A.N.U. rally at Bahati, Nairobi yesterday. (E.A.S. 13.7.64).

The influences of foreign diplomats were presumably extended to cover not only the politician but those secret groups whose activities were known before independence and had some form of power in the future of Kenya.

"K.A.D.U. asks Mr. Odinga who is to be blamed. The minister for Home Affairs Mr. Odinga was criticized by the general secretary of K.A.D.U. Mr. Shikuku yesterday for spreading anxiety among the people of Kenya. Mr. Odinga's repeated denials in the press and on television of what he calls stupid rumors are not helping.....

the country at all, he said. As soon as parliament reconvened he hoped to raise the matter and to demand that Mr. Odinga tell who were spreading the rumors and who intended to take over the government and why it was necessary to go on denying rumors which other people had not heard" (E.A.S. 14.7.64).

As mentioned above secret meetings and militancy of some of the groups did present some forms of threat at least according to some leaders. Moreover, the confusion of who was in what political camp made the initial 'kick-off-rumor-mongering' an impossible task to analyse and even to attempt to predict its future course, as the following illustration shows:

"M.P. claim on secret society denied. Criticism of the member for Nakuru East, Mr. Kubai came from Nakuru K.A.N.U. branch officials yesterday. The Vice-chairman Mbote denied Mr. Kubai's claim.....that there was a secret in the area plotting against the government....Mr. Kubai had alleged that meetings at Naivasha and Nakuru had been conducted by a few dissatisfied people - Ex-land freedom Army members" (E.A.S. 18.7.64).

The confusion created by the exponential growth of information-distortion became a matter of very serious concern to those

in position of guarding the security of the country. The initial kick-off had gone beyond "Odinga-phenomenon" as illustrated by the quote from the Minister of Defence:

"Rumor no basis for action. The Minister for Internal Security and Defence, Dr. Mungai declared yesterday in the house that the government was not going to accept rumor as a basis for action. We are very careful and we are always very careful in terms of what is said, so that we are not misled by anybody ..... only yesterday he heard that there were two members of the house who were intending to overthrow the government.....'I was most surprised to hear that Vice-President was rumored to be one of them and the other one myself', Dr. Mungai added" (E.A.S. 1.12.65).

One can observe that the rumor had evolved from "Odinga phenomenon" to the actual organ of national security itself in the name of minister of Defence. Looking over the Kenyan border to Tanzania, we encounter a parallel development. The only difference is that Tanzania took some measures to counter rumor-mongers while Kenya still dwelt on pronouncement of public condemnation.

"The modern Mark of Cain - a novel form of punishment has been meted to 17 people held responsible for spreading rumors in Tanzania. Their names are being published in the news-



papers and broadcast in radio news bulletin. A modern version of the Mark of Cain has been devised for their discomfuture and they will be made to suffer heavily from public disgrace. The Dean of Diplomatic Corps is also being interviewed by President Nyerere with a warning against participation of embassies in "rumor-mongering" (E.A.S. 16.5.66).

This particular case is important in the history of East African rumor-mongering. The information-distortion is not such a serious problem in Tanzania as in Kenya. The flow of public information is not confined to the upper layer of political and 'heavy' administrative bureaucracy. In other words, rumor, as self-amplifying process, is reduced by making government policies known to all the layers of societal system. Moreover, important decision affecting nation are publicly discussed or at least elements of arbitrariness and authoritarianism on all levels of societal structures is minimized by strong party organisation. Thus flow of information is checked and rechecked by party functionaries on all levels. Moreover there is a concerted effort to tell the public the real truth. One also sees the innovations devised to counter information-distortion. The introduction of 'Mark of Cain' technique of punishing the offenders would seem more effective than merely evoking constitutional or personality or oligarchical authority. Furthermore, involving the highest authority of political system (President of the country) to discuss this matter on radio with foreign diplomats is a genuine gesture to inform the Tanzanian masses about government policies and

those who are attempting to stifle the efforts i.e. reversion of deviation-amplifying mutual system with indeterminism (Maruyama, 1963). On the other hand Kenya's effort along this line lack this synchronized innovative impact. The solution devolves into stable systems of constitution (prime ordeal state/order) and individual rights which are presumed to be a negative entropy underlying Kenya's societal process. The following statement is a clear proof:

"Warning from Mr. Njonjo - the Attorney-General. Mr. Njonjo yesterday issued a severe warning to what he described as 'busy rumor-mongers' who were trying to misinterpret government intentions on issues concerning national development and national security .....(he) reaffirmed the government's unshakeable determination to wipe out subversive elements in all their guises .....although freedom of speech was entrenched in Kenyan constitution people should remember that to spread malicious rumor which created alarm and despondency was an offence" (E.A.S. 25.2.67).

The notable fact in this illustration is over-emphasis of negative feedback in a situation of deviation amplifying system. The application of positive entropy in this situation cannot be effective since the matter is constrained by primary mutual causal rights (constitutional entrenchment). There is an obvious paralysis of morphostatic and morphogenetic forces the consequence of which is inertia or in action. This apparent

ineffectiveness illustrated further by reference to the judicial final cause (prime ordeal) order, five months after Attorney General's statement.

"Careless talk - A spokesman from the Attoeney-General's office yesterday afternoon reminded people that to discuss matters which are "sub-judice" was tantamount to contempt of court and broadly speaking was an offence. The spokesman pointed out that it was an offence to spread rumors likely to create ill-will and hatred among various members of the community and which would also create alarm and despondency" (E.A.S. 6.12.67).

Authoritarian causality stated here illustrates allengers limited understanding of the nature of self-amplifying systems and their mechanism of indeterministic controls. Moreover these complex societal sub-systems need another form of cybernetics if an assault of complexity of deviation-amplifying system is to be made achieved. In majority of cases when faced with this complexity the explanations tend to revert to 'primeordeal reaffirmation' of static systems and equifinality.

"Imprisonment for divulging East African Community secrets - the East African Community has tightened its security. Legislation enacted yesterday by East African Legislative Assembly in Kampala means that all officers..

and employees of the Community will have to swear an oath of secrecy when joining the community.....the Bill provides for the preservation of the secrets of the community and its institutions and now replaces the former Official Secrets Act of 1964 which has been rendered incomplete and of restricted application by reason of the establishment of the community and various institutions within it" (E.A.S. 15.8.68).

Oath as a final cause has entered into many institutions and professions of western man. The authority of the Bible (holy scriptures of the primeordeal order) which descends from Greek and Judaic cosmologies is widely used in judicial and secret situations of western man. East African Community which is an extension of western man's system of organisation and thinking similarly use the same measures in order to preserve its identity. My query here is that single source of authority has a tendency to homogenization whose consequences may lead to totalitarian fascism, apism and authoritarianism which lack innovations even that of self-awareness. Homogenization can lead to self-affirmation and righteousness which corodes the internal functions of a system. The following statement tend to confirm uncritical righteousness and self-affirmation.

"Schoolboy jailed having Mao's writings - a youth who admitted possessing a prohibited publication which stated that 'political power grows out of the barrell of a gun' was on

Saturday sentenced to two years by Nairobi magistrate, Mr. McCready....Mr. Bell told the court that the principal theme of the book was revolution by force. It contained such phrases as 'political power grows out of the barrel of a gun, revolution and revolutionary wars are inevitable, war is the highest form of struggle for resolving contradictions, the settlement of the issue by war is the central task and the highest form of revolution'." (E.A.S. 10.2.69).

The reason for including this statement of over-reaction is due to the fact that it is seditious and subversive and according to the thesis of this paper it forms a subject of rumor-mongering (information-distortion). Homogenization leads to uncritical rationalisations of the system's functions. Hence unidirectional flow of information in this case merely polarize 'viceous circle' the consequences of which cause and effect become one i.e. the end justifies the means within the system as "the schoolboy" illustration shows many unrelated issues are tagged to justify the authority's action. The following statement attempts to justify the systems functions along cause-effect equation:

"Rumor-mongers greatest enemies -  
 rumor-mongers who spread falsehood and lies  
 were the greatest enemies of any state, the  
 Treasurer General of C.O.T.U., Mr. Mukuna  
 said yesterday. Since the assassination

of Mr. Mboya these evil-minded have been busy in the streets, in the bars and all around the countryside spreading rumors as to the motives behind the murder of our beloved minister. These rumors have not helped the government to trace the assassins but instead have caused tribal friction and aroused people's emotions" (E.A.S. 24.7.69).

Apart from justifying cause-effect equation system, homogenization tends to reject any input which may cause dissonance either positive or negative. Complementarity and situationalism as alternative explanation of systems functions are rejected on the grounds of their illogicality i.e. non-hierarchicality as seen in the following:

"Saboteurs of Unity warned - rumor-mongers to be exposed. Kenya's Vice President, Mr. Moi last night gave a warning of stern action against rumor-mongers and trouble makers who were sabotaging stability and good order.....there has of late been dangerous propoganda by some divisive elements mainly K.P.V. who working against national unity have tried to lead astray members of Luo tribe by inculcating unfounded fears among them. President Kenyatta has instructed me to repeat the assurance already given,

namely that the Luo will be given protection by government in everyway despite any malicious rumors to the contrary and as in the case of all other tribes will also be given the opportunity to play a full part in the nation building..... I would now like to touch on seditious material. The government is aware that some individuals or groups of individuals are trying to circulate seditious petitions and pamphlets. The public should be aware of this and anyone coming across such documents should hand them immediately to the nearest Police Station or district commissioner's office" (E.A.S. 24.10.69).

The existence of any variant political group in a cause-effect equation is seen as a source of instability. Hence destruction of the principle of complementarity. In the meantime the reassertion of hierarchical system is established by appealing to the supreme order of governmental hegemony which can reward or punish. The condition which generates this sort of information-distortion is somewhat glossed-over. No effort is made to attempt to tell the public (rumor-mongerees) the truth of the situation. Instead the public is further accused of indulging deeper into subversive activities and seditious literature. Information-distortion is not always confined to the invisible authority. Functionaries associated with the invisible system also facilitate the flow of misinformation. The analysis of mis-information flow depends on one's general orientation or the condition under which a particular system functions. In other

words functionaries merely manifest the attributes of cause-effect orientation of deviation-amplifying systems. As part of cause-effect system functionaries are justified in presuming or assuming the attributes of the major system - at least for survival factors. The following statement attempts to illustrate the logics of the relationship between ultimate cause and its subsequent functionaries:

"Rumor-monger wrong again - in the days before the President's speech the dismal jimmies had been having a field in the old Kenya custom of rumor-mongering. All sorts of dire economic moves were said about to be introduced, ranging from devaluation to bank nationalization. The press naturally ignored as it has long since learned too little truth they contain and in any case newspapers in this country do not like to spread alarm and despondency ..... Independent Kenya has a record of looking before it leaps in such matters..... this is why Kenya maintains its reputation overseas as order of the worthiest countries in the continent for investment and why the President said yesterday, 'we stand now on a platform of financial strength, with a currency that is sound and with substantial reserves in our own Central Bank'.....a sentimental insistence on economic independence at all costs can result in a country having complete control but over an economy which is stagnant ..... by taking a



realistic view point rather than doctrinaire one is building on a sound foundation which enables it to have an ever-growing control over expanding economy". (E.A.S. 2.6.70)

In this particular alleged rumor, it is very difficult to decipher whether the functionaries (in this case the newspaper media) are alleging rumors for themselves (in order to survive as foreign business and political institutions) or for the sake of super structure. The statement would seem to suggest the presence of both super-structure and functionary elements. The 'dismal jimmies' participating in the 'old Kenyan custom' would obviously be located in Kenya - since this is a Kenyan logic of existence (according to the newspaper). On the other hand over-emphasis on Kenya's reputation overseas as one of the 'worthiest countries in the continent for investment' is obviously an external input into Kenyan system. Moreover, the statement 'sentimental insistence on economic independence at all costs can result in a ... complete control but over an economy which is stagnant' is a clear affirmation of functionaries self-interest. The over-lapping of interest in this case could be one of the reasons for information-distortion. The so-called 'dismal jimmies' raise a rather serious problem of public truth on public issues. The allegers, on the other hand, may be used as the instruments of internal and external forces with distorted views about Kenyan system. Thus reaffirming further the hierarchical structure of unidirectional logics.

Functionaries are not necessarily confined to mass media but touch all aspects of the general system. In tuning

with super system the functionaries would play all types of role for the major system even if it means harping the same tune irrelevantly and illogically under any circumstance.

"P.C. hits at rumor-mongers - Nyanza P.C.

Mr. Cheluget said that rumor-mongers and those who went around sowing seeds of discord were the greatest enemies of development.....He told Dunga people that they must consider themselves lucky for being near a fresh water lake from which fish could be obtained for sale and consumption" (E.A.S. 19.10.71).

This alleged rumor-mongerism seems to imply that the Dunga should be grateful to the grace of the original cause for having given them fresh water and fish which forms the base for economic development. There are other people around the lake whose conditions of life are different from these Dunga and have different orientation e.g. Baganda. Anyway this circular and irrelevant allegation still point to the critical inability of the allegers to face the challenge of deviation-amplifying systems. Being on the top of information-flow does not necessarily imply understanding its cybernetics - a fact rumor-allegers do not seem to understand.

Other functionaries also are visible in rumor allegation. The survival factor is not so obvious in this case except in political terms.

"President Amin warns Luo rumor-mongers - General Amin has warned Luos in Uganda against spreading rumors about government of Kenya. 'They will be dealt with severely if caught'. he told a defence council meeting in Uganda. The meeting attended by 40 high-ranking Uganda army and air officers was told that some Luos had been alleging that Kenya was under the control of Kikuyus who were actively discriminating against other tribes" (E.A.S. 3.8.72).

The relevance of functionaries survival here is very remote. However there is no question with regard to the hierarchical information flow. This case, moreover, illustrates the principle of interference in the information-distortion. Amin comment can only serve as a rumor-exercibating mechanism. in Kenya's rumor-dynamics i.e. polarization of information-distortion by empathizing with either Kikuyus or Luos. This has also feedback effect on other ethnic groups - viz. anxieties over rumors on Kikuyu-Luo axis.

In addition to distorting information flow the rumor allegation gives a great deal of folk epistemology of the local conditions as the following case shows:

"The political spray-guns - once again certain payukaring politicians have been heavily criticised in Kenya this time by the

Vice-President, Mr. Moi dubbed them Nyanga'u (hyenas) using other strong words to condemn their unconstructive criticism. He doubted as many other people do, whether they could lead the country for an hour even if given the chance.....thus they attack the government. trying to show little is done for wananchi whereas they know all the answers and could wave magic wands of achievement .....witness the refusal of an Assistant Minister, Mr. J.M. Kariuki to go into details about his accusations against Lonrho and this paper" (E.A.S. 14.5.73, p. 6).

This particular statement brings very interesting epistemology. The term kupayuka in Swahili means to make utterances heedless. The 'ring' part of the word is an effort to infinitize the term in english i.e. payukaring in English is equivalent to kupayuka in Kiswahili. It also denotes unfounded allegations. In this context it has implied insanity or unbalanced mental judgement orientation. To a certain extent it is an utter contempt to describe the people who man the legislature and the judicial organs of the state. Nyanga'u in Kiswahili means a hyena. In Kenyan folk epistemology it is equivalent to 'Bastard' in western sense. The common name for hyena in Kiswahili is fisi, and one uses nyanga'u when he is in utter contempt. Nyanga'u denotes vultures, an abuse and ultimate bestiality. Wananchi politely means the 'children of the soil'. Otherwise the term denotes a peasant, a common person, or a proleteriat (in marxian sense).

The final selection of rumor allegation expresses a sense of despair. In other words, it has been accepted with bitterness that rumor has become a very effective weapon for attacking public figures or those supposed to carry out government policies.

"The season of rumors - so notorious is the rumor-mongering habit that ministers and even the President have felt compelled to issue warnings from time to time against spreading false stories and believing all the nonsense you hear in pubs and the clubs not to mention private houses.....(you know - who can he ought toknow). that certain prominent persons have left Kenya never to return. That other intend to do so in the near future, bound for U.K., Australia or wherever. That at least two well-known people have been beaten-up so badly they had to retire to their beds" (E.A.S. 18.6.73).

This final selection represents almost an institutionalized rumor-system of communicating, damaging or distorted information on government personalities. During this time the above rumor a prominent person was ill and it was reported that he was confined in bed on the doctor's advice. This was clearly reported in local mass media. In the meantime two personalities had gone overseas for the normal leave and yet the rumor had it that they had escaped to avoid serious measures about to be taken against them. All these rumors have turned-out to be false

claims. The rumor in this case seems to have become legitimate method of expressing dissent against government establishment. This point will be discussed further a little later.

From this selection let us now move to the other level of analysis. In the first instance let us examine the nature of rumor as observed in the above selection. Rumor, according to the above selection is a very effective weapon in distorting information regarding government establishment and its policies. It is quite clear the allegers in majority of cases are those who are already in government establishment. They include civil servants, labor union leaders, politicians and cabinet officials. Furthermore, included are some disgruntled members of the establishment in addition to 'wananchi'. The targets of rumor-communication are Kenya's present structure of political power and the distribution of developmental benefits throughout the country, as perceived by allegers. This is the first level in understanding evolution of rumor in this country. In attempting to explain the initial 'rumor-kick-off' one has to go back to events preceeding independence. The history of nationalism in Kenya as far as it can be ascertained seem to have developed in tribal structures. The reason for this development was the impact of conflict between internal and external forces (colonial-tribal contacts and conflicts thereof). In this sense every tribe in the country played a role in nationalist conflicts - at least in maintaining tribal integrity and territoriality. The intensity of nationalism depended on the acquisition by colonial power of the tribal resources. In the areas where land formed the major resource of tribal survival continuous conflicts were the order of nationalism. In cases where

grazing land was the major resource for tribal survival that formed the nationalistic conflict. For those whose survival depended on cattle resource their nationalism was intensified along that aspect. Although in the late forties and early fifties an effort was made to unify tribal-colonial conflict into a coherent or unified nationalism the effort was thruttled by colonial powers and consequently the emergence declared. The struggle for political power diffused into labour unions as they were the only ones allowed to form an organisation to defend worker's rights. Thus the transformation of collective nationalism into labour unionism with emphasis on individual worker's rights created further disintegration i.e. raggid individualism of the workers survival. In the middle and late fifties the labour union became the tools for nationalistic forces. Note also their field of action was in urban areas where factories were located. This development of urban nationalism tended to alienate the rural communities who were under the control of strict colonial administration. Another dimension which goes to this turmoil of eclectic nationalism is the various cadres of nationalistis. Prior to independence the 'urban nationalism' got a strong support from many ethnic groups. The leadership was somewhat young and vigorous with wide spectrum of national outlook (at least unified tribal support). On the other hand there were those leaders whose tribal clashes landed them in colonial imprisonment. These imprisoned leaders were claimed to be the true leaders of independent Kenya and no independence could have any meaning unless they formed part independent Kenyan government. This lack of clear focus as to who was the leader of nation (ultimate authority of nationalism) amplified more divisions within nationalist cadres. The young

leadership felt the old leaders were gone once and for all. At any rate they were fighting for tribal pieces of lands and not socio-political and economic independence. There was counter-movement led by Odinga who stuck guns for his old comrades in jail. Independence movement was the only unifying force as can be deduced from this macro-view of condition just prior to independence since cleavages along tribe, age, old leadership, young vigorous unionism, urban nationalism, race, creed etc. had already undermined the possibility of unified flow of public truth. The consequences of this eclectic representation was a further proliferation of politics scale around independence or there about. The 'Odinga phenomenon' was merely a logical consequence of the inhibitions of public/national authority - a function of preceding events. Thus the initial 'kick-off' of rumor-mongering seems to have been triggered by lack of coherent/collective nationalism coupled with complementarity and heterogenous elements of Kenya society (societies). This Kenyan heterogeneity was the base from which the 'politics of scales and oscillations' evolved. K.A.D.U. catered for disadvantaged ethnic groups of the coastal and outlying districts. It had also sympathies of minority racial groups. A.P.P. could be seen as a development of identity crisis i.e. lack of coherent role to play in the nationalistic game. K.A.N.U. attempted to symbiotize 'national societies' without ideology or knowledge of symbiotic principle. In other words K.A.N.U. presumed that political existence depends on the 'survival of the fittest'. The fittest in this sense implies to a number of things viz. manipulation, modernized, non-tolerant, dominance, adaptedness in the politics of scale. Symbiosis in this context means supremacy of mutual existence irrespective of similarities and differences.



All these factors were responsible for failing to develop a strong political party which could guarantee the highest command of political heights. The consequence of this lack of unifying force on party level was the development of politics of personality. Persons became more important than nationalism (unity of Nation). To carry this matter to its logical conclusion persons became one with political order, law and source of public truth or the public itself. This situation from one theory seems to be responsible for the development of the present information-distortion. In short one cannot get the truth about certain realities without encroaching on personality involvement. Moreover, one cannot talk of these personalities since in the opinion of wananchi they are archtypes of law, order, authority and power. All one can expect in this situation is a tangential flow of information from personality functionaries. This is what constitutes rumor as currently perceived and conceived in Kenya.

Apart from the eclectic nature of Kenyan reality, rumor-mongerism can be seen as a natural process characteristic of biological and social systems.

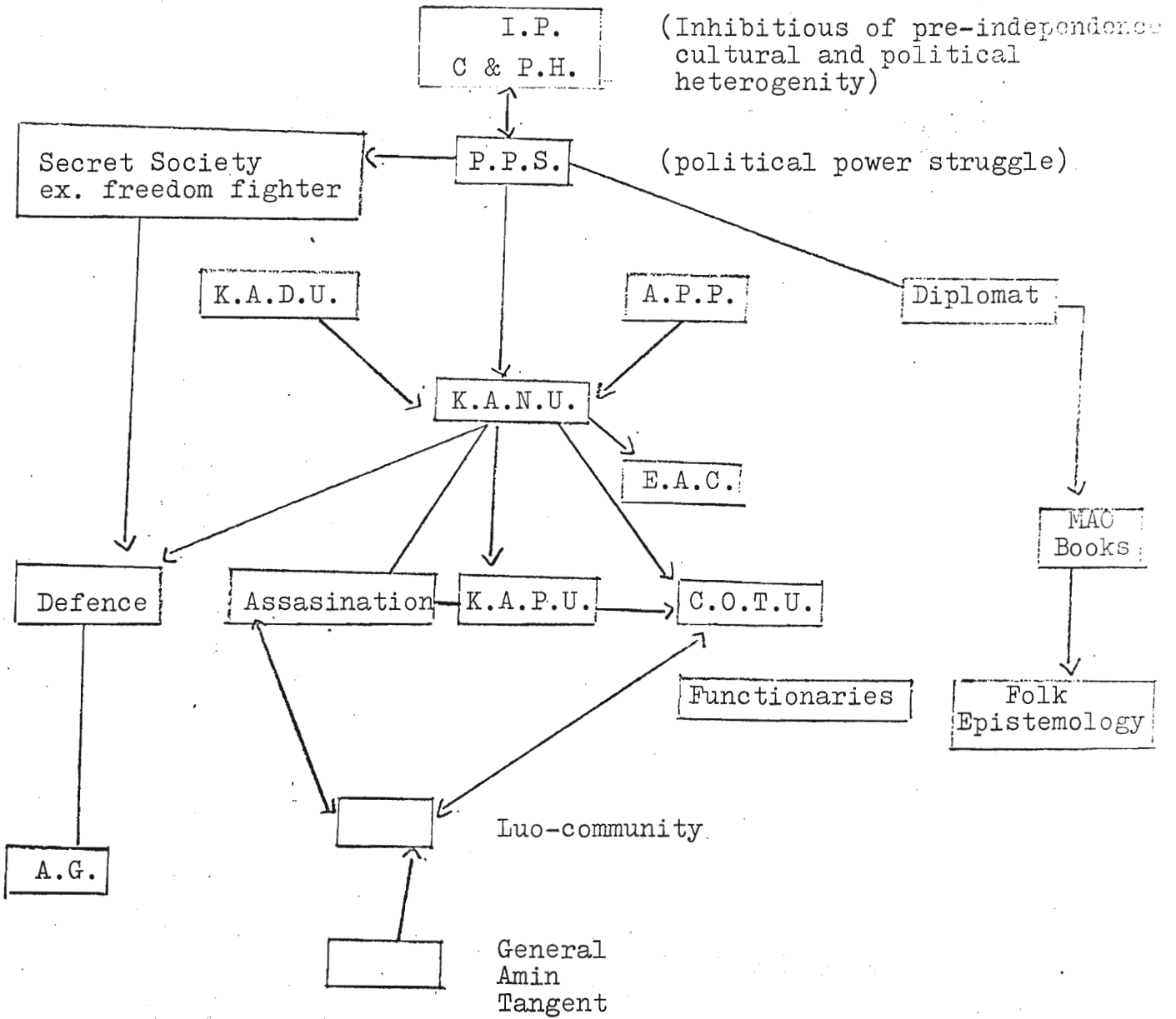
"The general rule of the biological and social universe is increase of diversification, heterogeneity and symbiotization. What survives is not the strongest but the most symbiotic" (Maruyama, p. 5 A.A.A.C., 1972).

The general view of "rumor-mongering" stated in the above selection is that it tends to be non-undirectional in causality; emphasizes

dismilarity in public and private information; disrupts national security according to the Kenyan establishment and ultimately disturbs peace. All these allegation in a way point the tragedy of the 20th century man of which Kenya's case is of menifestations or attests. This tragedy is engrained in the belief that science and technology, with their entrenchment in Greco-Judeo-Christian unidirectional causality, tends towards uniformity, similarity, generality, all of which are virtues to be striven for in this world. Unidirectional causality assumes that there is only one way of analysing systems i.e. cause - effect relationship. This logic characteristic of western man system of thinking has become the dominant logic at least in the large portion of this century. It is only within the last decade or so that it has been recognized such logic makes little impact in explaining so-called 'open systems' (biosocial system). In simple terms cause-effect relationships apply to non-living systems where teleology or purposeness are altogether disregarded as serious questions in scientific venture. On the other hand, the 'biosocial systems' or living systems have intrinsic value which raise the questions of teleology and purpose as serious matter in all scientific ventures. Open or self-amplifying systems raise serious issues which cannot be brushed-aside by 'cause-effect equation' of 'classical models of physics'. Self-amplifying system tends to go against the second law of themodynamics which assume the decay of structure with increase in heterogeneity. Kenya's rumor-mongering is a self amplifying system which teleological issues and purposiveness are important in Kenya's societal objective. Moreover as a function in the social universe rumor diversifies, heterogenizes and symbiotizes in self- edification. FIGURE I attempts to represent rumor in its own field as illustrated by the rumor hypothetical

intent structure in the selection.

'Rumor's Initial Kick-off'



The growth of rumor in Kenya since independence has been exponential except that the growth path is not mitotic. It is not a simple biological growth predetermined by previous sets. The growth is in complexity where interactions emerge depending on specified issues. The growth is relational and heterogeneous.

From this intent-rumor-structure several factors do emerge. First, why rumor-monger? This question is not easy to answer because the context from which rumor-function is itself very complex. One of the causes of information-distortion is cultural heterogeneity. Lack of common language could be a source of misinformation. Kenya's case suggests that language could be partly responsible for misinformation. Issues of public interest are usually announced in the Official Gazette which is always written in English. It is estimated that only about 2% of Kenya's population speak some English. The rest do not understand it. Hence the 98% has to depend on secondary interpretation for official announcement. Even though Kiswahili is estimated to be spoken by over 80% of the people, still cultural, and linguistic heterogeneity will tend to vindicate homogenization of any form. Thus rumor-mongering may be an indication of a very fundamental logic which characterizes Kenyan reality.

"If world view existed for Akamba it would be in the form of an array of categorizations. All function in harmony for mutuality and in the meantime each maintains its categorical unity in one form or another. Although such segmentary existence may seem exaggerated among the Akamba,

it is not an uncommon phenomenon throughout Africa and a close look at tribal life manifests it" (Ndeti, p. 64, 1972).

What seems to be rumor-mongering may be an indication of a fundamental principle underlying the eclectic existence of African reality. Obviously the secret of survival as seen in the above quotation is the recognition of similarities and differences and their mutual harmony in existence. In other words, the world as seen from African epistemology is composed of multiplicity similarities and dissimilarities and it is illogical to establish the primacy of one over the other. The issue of "survival of the Fittest" does not arise, but that of harmonious-symbiotics does because differential competition/conflict are resolved. Thus the so-called "rumor-mongering" could be a reaction to this fundamental logic of African mutual harmony.

"In medieval thought science could be dismissed at pleasure, but this is impossible in the case of Yoruba thought, since faith and reason are mutually dependent. In modern times, God even has no place in scientific thinking. This was impossible to the Yorubas, since from the Olodumare an architectonic of the knowledge was built in which the finger of God is manifest in the most rudimentary elements of nature. Philosophy, politics, social theory, land law, medicine, psychology, birth and burial all find themselves logically concatenated in a system so tight that to subtract an item

from the whole is to paralyse the structure of the whole" (Adesanya, p. 38, 1958).

This quotation confirms the harmony of mutual symbiosis in African logical systems. The undirectional logic of Europe as represented by Levy-Bruhl called the African system "prelogicalism". i.e. this system of logic has no place in European thought. Complementarity or coincidence of opposites is the order which the rumor-allegers in Kenya fail to recognize.

Finally, I would like to touch the issue of public rumor-mongering apart from the conditions raised above, occur in a situation where effort is deliberately made to bar the public from official truth. I believe the best way to counter-act rumor-mongering is not to hide behind the mystic of bureaucracy a crime not uncommon among Kenyan establishment but to tell the facts and let public pass a judgement. We all realize truth hurts and it is more so if efforts are made to protect personalities against public corruption. Furthermore, the issue is complicated in cases where public scandals are allowed to pass without due punishment to the offenders. All these conditions and others are the circumstances which enable rumor to thrive. The best way to kill information-distortion is not by threats of imprisonment and public pronouncement but by laying bare the facts about public issues and policies. Public is the source of power in whatever form. On the other hand public leaders are merely convenient fictions of power i.e. they possess power as long as they are under the umbrella of public power. Rumors will continue self-amplifying as long as Kenya's establishment ignores the real source and dynamics of power.

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COMMUNICATION. LEARNING FROM THE PEASANT

"The participation of all people towards their self-realisation through communication."

by Brian St. Quentin Power  
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This ideal not only supposes that everyone, including the many poor peasants in the world, should be allowed to participate (today rather than tomorrow) in all matters affecting their lives; it also asks educated people, however highly qualified, to be open to receiving from the peasant both what he has to say and how he says it.

All over the People's Republic of China that is attempted. When I re-visited China this year I saw displayed in many places the appeal: "Learn from the peasant." In the commune where I stayed, professors, students and administrators were working side by side with the peasants. This promotes an exchange of views and experiences between educated people and the humblest workers; it also lends vitality to the way in which they communicate with each other.

"Think wise thoughts but speak the language of the common people." The advice is well known to Europe. It is easily uttered, but extremely hard to practise. The Greeks knew it. Montaigne could say: "Down in the field there is a man digging and it is he and his like who live the real life and speak the real language. There are more of the qualities that matter among the unschooled than among the educated." No wonder that Montaigne was barred from schools for two centuries, ostensibly on the ground that his free and spontaneous style did not follow the accepted school-room rules of order. The poet W.B. Yeats, leader of the Anglo-Irish literary movement of the early 900s, was inspired by the language of Irish peasants. J.M. Synge the playwright found among the Arran islanders veins of thought and expression which have enriched Irish literature and drama.

But nowadays we in the West have largely forgotten that advice. Well meaning, we appeal for education to be provided for all, as if the traffic of education were only one way. What of the knowledge we might receive from the unschooled? Apart from primitive art have we nothing else to learn? We dispense information and opinion in a variety of ways. Experts produce more or less obscure books for a small and cultivated class. Oracles address audiences from raised platforms, condescending to answer a few questions (with apologies for leaving so little time) at the end of their monologues. In so far as communication implies an exchange, they communicate half-heartedly. On the other hand, our popular means of disseminating information often water down wise thoughts to a trivial level for vast numbers of urban consumers.



Until recently, specialists such as research scientists felt little need to justify their activities publicly. But now an increasing number of ordinary people demand that science should be more relevant to the practical needs of society. They want a greater say in the affairs of science and technology. When one considers that one fifth of all scientists in the world are employed by the military, it is not far-fetched to claim that science is too important to be left to the scientist. There is now less awe of the specialist, and we may expect less tolerance of his obscurities.

The obscurantists of any generation are, in the main, the practitioners of the dominant method of thinking and their imitators. The Law has had its day; although from the backwaters it continues to issue vapours of mystifying language, and its child the bureaucratic mind is still with us. Today it is the turn of scientists and their satellites. Scientific methods dominate to such an extent that teachers and experts in branches of learning and activities far removed from science are anxious to appear scientific. Thus are bred many so-called sciences whose practitioners mix objective, quantitative statements with human value judgements. The result is utter confusion.

The temptations to be obscure are many. A code language with which only the initiated are familiar, will guard knowledge as private property. The use of complicated words will make the simple sound difficult and the well known sound new. The up to date obscurantist knows that if he is really to impress, his words should have a "scientific" ring; so, for instance, he says "correct within an order of magnitude" when he means "wrong". How ironic all this is when one realises that most concepts of science are relatively simple once they are understood and grasped concretely.

At the universities it is notorious that specialists from different disciplines find it difficult to communicate with each other. The difficulty is largely of their own making; it comes from the arrogant attitude of some academics to their own subjects and to other people's. As for learning from the peasant, apart from students of folk lore, that suggestion would strike most specialists as too ridiculous to be taken seriously. Isolated from the rest of humanity, they exchange data and truths in the chaste tongue of the intellect unsullied by human experience.

From the universities many graduates bring with them a language deficient in vitamins. Most of all they lack spontaneity. In my experience, the chief difficulty in teaching them skills of communication is to show that communication involves the whole person and not just the intellect; and to draw out their moral, imaginative, dramatic, sensuous and physical sides. Their cramped ways of communicating reveal the frustrations that come from competitive examinations.

At their new places of work, where the management is often bureaucratic, those cramped ways are hardened rather than relaxed. They complain that they are made to write in an impersonal style which gives the appearance of objectivity, and at meetings their scope for participation is small. Many resign themselves to becoming cogs in a machine.

At its worst, an obscure machine language by an educated class can be a form of oppression because it deprives the uninitiated of the chance to participate. How can people respond to what they do not understand? Life is dehumanised when the human touch in language is extinguished by the impersonal.

But do peasants really want to listen to the scientist and the technologist? It was a moving experience to see, as I did on my recent return to China, workers in factories and peasants in communes so full of enthusiasm to learn. They follow up their learning by organising their own courses and making their own text books. When they acquire skills and when they solve problems, they do not hoard their knowledge, but communicate it to other communes. Everyone is a teacher. There is a constant traffic of experience and ideas passing between communes where education is seen as a life-long process. The 1949 Constitution of the People's Republic declares that the education and culture of China are scientific and popular. "Love of the people, love of labour, love of science and the care of the people's environment shall be promoted as the public spirit." Little promotion is needed among a people who have awakened to the fact that the land is theirs to develop and conserve.

What of the peasants' potential for learning? Norman Bethune, the Canadian surgeon who served with the Red Army in the war of liberation against Japan, trained peasant boys who had never been to school, to become good doctors. Now young barefoot doctors serve the people in their homes, in the fields, and in factory clinics. When they come to hospitals for formal training, they bring the keen edge of interest of those who have already been involved in the most practical ways with the health of the community. Like the university students, they are chosen by their local community, being thought likely to serve the people rather than use their skills to acquire privileges and promote their own interests.

In Sian in Shansi province, about 5000 people, mostly poor peasants, visit the Historical museum each day; just as in Mexico City the Indians throng to their museum of Anthropology. On Sundays, when admission is free, Indian peasant families, the women carrying babies on their backs, come to the museum from the country. They clearly regard it as a convivial place of learning.

To communicate involves receiving as well as giving. Even if the professionally qualified did speak to the people clearly and humanly, their task of communicating would only be half complete; there remains the need to receive from the peasant not only what he says but how he says it,

Those who work with peasants find that their language is re-vitalised. In spite of poverty, oppression and official persecution of their language, peasants all over the world retain a vivid, elemental, concrete speech, reflecting acute powers of observation. This is true of the Hebridean Gaelic speakers as it is of the Mexican Indians. When they have something to say, peasants express themselves with the whole person. An alert posture, a primitive richness of voice, physical gestures, a sense of the dramatic, a lively imagination, and a feeling for the poetic combine to sustain and enrich what they actually say in words.

Of all languages, Chinese is perhaps best suited for simple concrete expression. The very strokes that make up its ideographs are rooted in peasant life : sheep's leg, trunk of an old tree, a falling rock, a vine stem, a rolling wave. The Chinese describe rather than use labels; this is noticeable in their medical terms. They say "blood pressure calculator" where Western doctors say "sphygmomanometer". China is concerned to keep alive the rich variety of minority languages spoken in the fifty-four autonomous regions. The principle of variety within unity is well demonstrated at the College of the Nationalities in Peking where students from Tibet, Mongolia and other regions are taught their own language and literature up to an advanced level as well as the Han (Chinese) language.

Sharing the life of the peasant and learning from him are extremely difficult and painful, especially for the older intellectuals. One must first reach the peasants; I met some students from Tientsin University who had walked 1000 kilometres to reach the mountainous commune in Shansi province where they worked. The austerity, the long hours of farm work from early morning until dark, the strangeness of the language; all these are hard to bear and demand constant effort. And what of excellence? Must it be sacrificed? Mao Tse-Tung has expressed his sympathetic understanding of these real difficulties. A change of attitude is called for. Excellence, for instance, can be seen to lie in the ultimate purpose of creating good relations between people and not merely in perfecting skills. Only the experience of living among people can give one a real understanding of their way of life and the way they feel. Professor Tsien Ling-Hi, a teacher of science for thirty years, reveals that until he lived with the peasants he never really faced the question : knowledge, research - for whom? Gradually, he came to have a common language with the peasants. Only then could he serve them.

Needless to say, the peasant's way of thinking, so clearly reflected in his speech, is far removed from Cartesian rationalism which became the dominant intellectual current in the seventeenth century Europe. Knowledge for the peasant means understanding what it is to strive, want, fear, imagine, hope; and he "knows" things differently from the way in which men "know" logical truths. His "knowing" is founded on personal experience and imaginative insight into the experience of other men. He has, therefore, a remarkable capacity for giving one his full attention; a rare quality in communication. In China I was struck by the way people would gather spontaneously and join in a conversation; laughing when one joked, falling silent when one was serious. There were no strangers.

This quality of imaginative insight and sensitivity to the emotions of others is a healthy corrective to the practice of analysing social relations by quantitative, "scientific" methods which can lead to de-humanising techniques and a tendency to classify human beings in mechanical ways, ignoring their spontaneous desires and feelings.

Spontaneity was the quality that impressed me most at the meetings I attended in China. Taking part in meetings has become a way of life for the Chinese. They have come to see themselves as members of a society with responsibilities to it; a surge of ideas flows from the people. Their meetings are lively and free of formality and procedures. Young girls speak up without inhibitions. As a rule the surroundings are aesthetically pleasing and the atmosphere convivial.

Our intellectual achievements are wasted if we lose the zest for life of fully rounded persons. The peasant's relish for the experience of life, which he expresses so vividly in his speech is a lesson for us all. He has an instinct for putting human values first, so that his speech conveys an awareness of purpose and one feels on listening, that besides life as it is, there is also life as it ought to be. To communicate with him at an intimate level is an invigorating experience.

POTENTIAL APPLICATIONS OF COMPUTERIZED CONFERENCING  
IN DEVELOPING COUNTRIES^

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INTRODUCTION

With all the demands for scarce resources facing those dealing with a developing country environment, it may, on the surface, seem absurd to recommend a relatively new "high technology" communication process for serious consideration. It is my own feeling that the resulting benefits in a developing country situation from both a physical and a psychological viewpoint are tremendous. I hope by describing a number of applications to convey this feeling to the reader. However, in order to lay to rest the concerns associated with the problems of implementing such a system, let me first summarize the physical requirements for implementation.

Physical Requirements

Let us assume, as an example, that we wish to tie together via computerized conferencing 100 villages or small towns in a geographical region. It is first necessary that there be a reasonably reliable telephone system (radio or hard wire) capable of connecting each of the 100 locations to a central point, and that sufficient power is available to run the equivalent of a few television sets at each location. Under these minimum conditions, the following equipment is needed:

<u>ITEM</u>	<u>COST RANGE (Dollars)</u>
One mini computer	100,000 - 200,000
One terminal at each location (\$1000-2000 each)	<u>100,000 - 200,000</u>
Total cost	200,000 - 400,000
Cost per village	2,000 - 4,000

We see that the cost of installing such a system is about equivalent to buying a small truck for each village. In terms of viewing

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^ The views expressed in this paper are those of the author and do not necessarily reflect official policy of the Office of Emergency Preparedness.

^^ "Party-Line and Discussion: Two Computerized Conferencing Systems" by Murray Turoff, Proceedings of the First International Conference on Computer Communications, October 1972, available from IEEE (Institute of Electrical and Electronic Engineers, New York City).

"Human Communications via Data Networks" by Murray Turoff, Computer Decisions Magazine, January 1973, Hayden Publications, New York City.

communications as a substitution for travel, this cost comparison is a useful one to keep in mind.

A keyboard that utilizes a TV set as a screen currently sells for about \$1000 at single unit price, and a complete hardcopy terminal can be obtained for about \$2000. The costs could be higher if the phone system is of sufficiently low quality that special equipment is needed to reduce noise-generated errors in the phone lines and switches.

In addition to these requirements, an individual at each location must be taught the operation of the system. Experience indicates that the hardest part of that is probably the acquisition of a casual typing skill.

Costs of equipment are declining at a rapid rate, and by perhaps 1976 they should be about half what they are today. In addition, if planning efforts for improving the two-way communication network in a developing area by either wire or radio-TV give careful consideration to installation of this type of capability, costs could be further reduced. As part of an integrated design, the marginal costs for adding this capability should be minimal.

### Applications

What we have, once this equipment is installed, is a large blackboard with each village or location having a long piece of chalk. We would divide this blackboard into various segments, each devoted to a different purpose -- in essence, a separate conference. Our system differs from the more common information system configurations in that our information is that which the users are putting in; i.e., system data sources and recipients are synonomous. In other words, the system is devoted to information exchange among the various participants. Some obvious applications are:

(1) A "bid and barter" conference

If someone in one village has something he wishes to exchange, sell, or rent, he can put in a notice, or if he is seeking something he can also place a notice.

The responses would also be entered, as well as a final agreement and physical arrangements for the exchange.

This particular conference would possibly aid the economic viability of the region, providing a village and its individuals with a much wider market. Temporary exchanges of equipment among villages would facilitate more efficient resource sharing.

(2) Regional Planning and Issues

Here villages in a given area could set up a conference to discuss some project that affected them all, such as a new road or improvement to a water system.

This type of capability could have a tremendous psychological impact of producing a feeling of regional cohesiveness among villages that previously felt somewhat isolated or independent. It also means a region could arrive at its own consensus, which might represent much stronger input to plans formed at the national level. It presents a unique capability for building up regional democratic processes which could only be duplicated otherwise by time consuming travel among representatives of all the village.

(3) Regional Crop Planning

Here villages could compare notes on various plans for agricultural products. Villages could compare how much planting of a particular crop they plan and perhaps arrive at a more efficient distribution.

Once again this type application would aid in producing a feeling of working together as a region. It also provides a forum for specialists to participate by offering advice on particular plans. This leads us into another application.

#### (4) Use of Specialists

A number of conferences could be set up on particular problem areas, such as insect control, public health, and crop diseases. Villages can submit their questions, problems, requests for special aid or visits. Each conference would have a specialist who could respond directly.

In any developing area it is likely that specialists are in short supply. Such a capability would allow better use of specialists' time and probably allow better planning of his travel around the region. Such an individual could interact with the conference from any of the villages and modify his travel plans as appropriate at any point in his trip.

#### (5) Governmental Information Exchanges

could be entered through one conference where all the villages observe what is taking place. There might be a separate conference for each of the major government divisions -- public works, education, etc.

Such a conference would have the benefit of eliminating duplicate requests from different villages. It would also put psychological pressure on government departments to be responsive in a timely manner, since everybody sees a written record of how quickly responses are forthcoming. Given that the government would be responsive (this is not a foregone conclusion, even in developed countries) this could have the obvious benefit of producing in the villagers a feeling of being closer to their governments. Note that this visibility of the quality of government services is likely to be unpopular with government officials, which can jeopardize implementation or support of the whole system.

#### (6) Personal Messages

The system can be used to allow an individual to send a message to an individual in another village. In essence, this could be an ability to send short letters.



This personal use of the system is important to overcoming any psychological blocks to using the system. It might also be argued that the government department that handles the postal service would be a logical vehicle for instituting the system, as it could be viewed as an electronic mail system. On the other hand, extensive use of this capability can overload the system and reduce the effectiveness of other functions, so that some form of control or upper limit must be considered for imposition when necessary.

As with all forms of communication, the particular user environment and experience will no doubt generate a multitude of applications beyond those suggested above. The use of the computer as a storage medium for the content of the communication also allows the ability to structure the communications for any particular purpose. This runs the gauntlet from free discussion formats to highly structure voting procedures.<sup>^</sup>

#### A Word of Caution

Systems of the type I have discussed are intended for use by non-technical people. A lesson I have learned over many years is that several seemingly mundane considerations are exceedingly critical to achieving successful use. Such items as the layout of the keyboard, the form of the terminal interaction, and the number of functions or symbols that have to be learned and remembered, can make tremendous difference in how easily individuals can learn to utilize these systems. Such problems are often overlooked by individuals wrapped up in the technology. I would urge that any effort to implement such a system receive special emphasis on this aspect of its specific implementation from individuals having extensive understanding of the behavioral patterns of the intended user community.

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<sup>^</sup> See "Human Communication" by Murray Turoff EKISTICS, Vol. 35, Number 211, June 1973.

One approach to implementation is to train one individual in the village as a "village communication." His role would be analogous to the radio operator on a ship. Assuming the individual can read and write, this training should not take more than a month and most of the effort would be to develop a typing skill. Since such a position is likely to carry with it a degree of respect within the village structure, motivation should not be a problem. It is probably better from a psychological standpoint to train a villager for this function than to bring in an outsider.

### Conclusion

One can utilize computerized conferencing procedures to accomplish almost any function performed by other media of communications. The use of the computer introduces certain efficiencies in the use of time on the part of individuals that for many applications justifies the necessary investment in equipment. I would normally emphasize this aspect in justifying the system for use in corporations or governmental bodies. However, in the developing country environment I tend to believe the potential psychological effects are far more significant. Distance in a developing areas is a much more critical dimension, and time a more demanding quantity. Applications that I have discussed, and others that no doubt will be thought of, could go a long way to reducing time and distance constraints. The result could be to produce a new air of closeness and cooperation, both among villages in a region and with the central government.

From a more general viewpoint a detail cost analyses would probably show that the concept of placing a terminal in each village is cheaper and more advantageous in the long run than attempting to place a phone in each family unit. In other words, the developing country would be better off in bypassing the evolution of communications that took place in developed countries and move directly into "store and forward" forms of communication systems which is more representative of today's digital communication technology.



