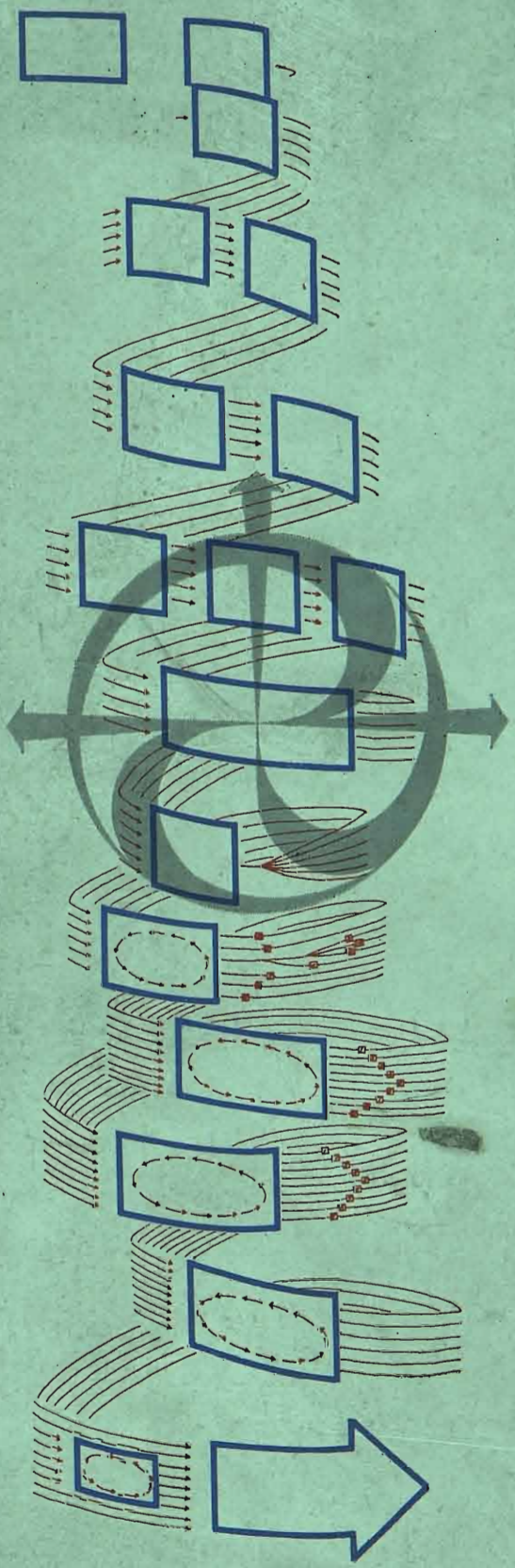


HUMAN NEEDS
NEW SOCIETIES
SUPPORTIVE TECHNOLOGIES

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

VOLUME II

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

WORLD FUTURE RESEARCH CONFERENCES
Continuing Committee

HUMAN NEEDS
NEW SOCIETIES
SUPPORTIVE TECHNOLOGIES

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

VOLUME II

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

WORLD FUTURE RESEARCH CONFERENCES
Continuing Committee

Published by IRADES, Institute of Research and Education in Futures Studies, via Paisiello 6, 00198 Roma, Italy, and distributed by Edizioni Previsionali, via Paisiello 4, 00198 Roma, Italy

---

SUMMARY

VOLUME I

- *Summary*
- *General index*
- *Contents*
- *Foreword*

CONFERENCE PREPARATIONS:

- Memoranda
- Program

CONFERENCE PROCEDURE:

- Introduction
- Basic papers *(abstracts)*
- Panel
- Working group 1

  Alternative concepts of human development, including personal development as a complement or alternative to economic development: presentation of images and conceptualisations of persons whose development depends not only on food needs etc. but also on communication, interpersonal relationships, etc.

VOLUME II

VOLUME III

VOLUME IV

VOLUME V

CONTENTS

GROUP 2

The need for man to accept responsibility for what is required of him by social institutions, and the need for institutions to become true facilitators in the man-society interaction.

May 1973

"The need for Man to take Responsibility".....

by Sir Richard Acland

So we want ordinary people everywhere to take personal responsibility for living and working through the social changes (many initially painful) required by our living on a limited planet.

This will depend, no doubt, on ten thousand little decisions each requiring technical expertise. But these will all be useless unless they are based on two Major Decisions that depend on Wisdom.

(1) The People must Understand the reasons for the social changes. This requires that in each country and continent a large organisation (hereinafter called Stable State Initiative) must clearly take responsibility for a vast public campaign in favour of Stable State Society against Exponential Growth Society.

(2) The People must Approve of the ultimate objective to which the whole social effort is being directed. This requires, amongst other things, that the leaders of Stable State Initiative must positively (1) proclaim that we must now begin (2) to make up our minds that in due time (3) we shall get the whole of privately-owned (4) money-making Big Business (hereinafter called the Corporations) off our backs so as to establish, in one or other of its possible forms (5) the Common Ownership of all the great (6) resources.

Let us be clear: (A) The establishment of Common Ownership does not, itself, do anything at all to create any sense of responsibility. Yet (B) the proclaimed determination to achieve Common Ownership allows for the growth of responsibility if it can be generated by other forces. By contrast (C) the determination to preserve the Corporations absolutely vetoes the emergence of responsibility even though the forces necessary for its generation might otherwise be present. (7)

Footnote figures refer to sections where each point is expanded below

Section 1. The Need for a Positive Statement.

Some people think that the Stable State Initiative need make no declaration on this subject one way or other. Thus, it is supposed, it can have the best of both worlds, by bringing into its ranks both those who would agree with the proposed declaration and those who would disagree.

This is literally impossible because, on any issue of this magnitude, silence is the loudest way of supporting the status quo.

By the very fact of saying nothing at all, the Stable State Initiative would be positively and very loudly saying that its aims can be achieved within societies which are in effect dominated by the Corporations.

Section 2. What is it that must happen "Now" ?

It is not necessary that we shall "now" establish the whole of Common Ownership with all its innumerable detailed problems all tidied up. We only need now to begin to make up our minds that "in due time" it shall be wholly established.

Section 3. What happens until we arrive at "Due Time"?

Doubtless, for many years, any western country or continent will have to make use of the Corporations, while trying to bend their behaviour towards the practices required by Stable State Society, by all the "stick and carrot" financial policies that the Chancellors of their Exchequers can think of.

Section 4. Why does Ownership matter?

Now that decisions in the Corporations are made, de facto, by the Corporations' Technostructures (see Section 7 below) some people have adopted the belief that the private ownership of the share certificates in the great Corporations is an irrelevancy. This is nonsense. It is nothing other than the shareholders' de jure ownership of their shares which, de facto, puts into the hands of the Corporation's Technostructure, the whole control over the public money paid for the Corporation's goods or services so that, after paying whatever taxes may be legally due, after satisfying the shareholders with their customary dividend, the entire surplus is unqualifiedly at the disposal of the Corporation's Technostructure so that they can deploy it, in whatever way they think best, for enlarging the "Empire" of "their" Corporation.

Section 5. What IS Common Ownership?

Up to now, in western countries, we have seen Common Ownership in two main forms; undertakings have sometimes been Nationalised, sometimes Municipalised. Under either form we have seen a wide variety of internal organisation. Most particularly we have seen some where detailed local actions depend absolutely on orders emanating from some centre, and others where wide local autonomies have been delegated to the people on the spot. We have also seen some where traditional "cash accountancy" has been the main criterion, or at any rate one of the main criteria, for deciding about the allocation of resources between one unit or another within the nationalised or municipalised undertakings; and we have seen others where such decisions have depended wholly or mainly on quite different criteria. No one can lay down in advance, for any particular kind of enterprise, that one and only one kind of arrangement is appropriate.

But why must we halt our ideas at municipalisation and nationalisation? Why could not the really great resources of mankind be directed, and in effect owned, by representatives of a whole continent, or even of the whole of Mankind.

I, for one, would not mind so much that the oil bosses have diddled the British Government out of our proper share in the profits of North Sea Gas and Oil if I could feel that ALL the cash profits of the World's Oil Department, would be handed over to some international agency charged with mounting a real attack on the poverty of the World's Poor. What makes me wild is to think that these profits, which should have been largely ours, will be at the untrammelled disposal of the oil bosses for the purpose of Oil Empire Building.

Section 6. What resources are not "Great".

Once, while he was a guest in my father's house, I heard David Lloyd George say: "Beyond doubt you have great difficulty in drawing an exact line between Day and Night. But I never heard that this prevents a general from making a night attack if he wants to." In the same way it may be difficult to draw exact lines between small and great resources. But, to offer some kind of idea, up to some fifty employees, there is no reason why thousands and thousands of little privately owned firms should not operate under the general umbrella of the Common Ownership community: just as today thousands of them work under the umbrella of the giant Corporations.

Section 7. Why does express or implied determination to preserve the Corporations put an absolute veto on the emergence of any sense of social responsibility.

If the immediate appeal for an immediate increase in social responsibility is to stand any chance of being effectively heard, then the long-term intention of those who make the appeal must be that

in due time men and women shall live in societies that can function as communities in principle.

Under the Corporations this cannot happen. In a typical western country or continent there are no institutions in and through which the representatives and salaried servants of the whole community can ask and try to answer the three essential community questions which are:-

(1) What are our resources?

(2) What are our needs?

(3) How shall we deploy our resources to meet our needs in some agreed order of social priority?

Under the Corporations, the only great question which ever exercises Government Ministers, Members of Parliament, Civil Servants and (at election times) Electors is:

> How shall we arrange the financial aspects of our common affairs in the hope that other people (i.e. the faceless men who run the Corporations) will be induced, in pursuit of their Corporation's self-interest, to do some of the things that we want doing?

Except in the name of an utterly outdated kind of chauvinistic Patriotism, no one can make an appeal for responsibility to any community unless he unambiguously proclaims that, in due time, he intends absolutely to end the legal basis on which this appalling travesty of a community is now based.

Put it another way. So long as all the important people in any society, openly or by their silence, proclaim that they see nothing wrong with a state of affairs in which all the really important decisions are made by very rich men at their Board Room tables on the criterion of "What does this mean to us?" then what hope is there that the generality of men and women in the middle and at the bottom of the industrial set-up will ever make their decisions on any other basis than "What does it mean to me?".

LABOUR MIGRANTS IN A KHARTHOUM DEIM

By Ahmed, Nizam Uddin
Lecturer, University of Khartoum

The present article is based on the materials from a sociological study which was carried out on labour migrants in Khartoum, the capital city of the Sudan. It has concentrated on some important aspects such as demography, education, household and family, occupation, migration, and attitudes of the migrants. In this research no attempts were made to test a hypothesis. However, the study, in general, has revealed much interesting and useful information about labour migrants in the Sudan.

Khartoum became a capital of growing importance after the Sudan achieved her independence in the year 1956. The city expanded in almost every direction; new and more surrounding areas became part of the capital, population increased, new offices, industries and shops grew up, and formerly Gordon College turned into a university to meet the needs and aspirations of an independent nation. All these offered jobs and created opportunities for a better economic life which attracted the people, particularly the youth, from all parts of the Sudan. Many of those who flocked to the capital got good jobs, accommodation, etc.; others like the migrants under study, for some reason or other, ended up with low paid jobs, or no job at all, and with settlment in the Deim.

The settlement of the labour migrants is located near the government sugar store in the Industrial Area of the city, a west-end suburb of Khartoum. (1) The settlement is known or referred to by the government officials as well as the public as the Deim. The word Deim in Arabic is generally used to mean an offshoot settlement or slum area. The Deim under study is one of the five situated in different

parts of the city. All these Deims are officially considered as illegal settlements, which means, that the inhabitants have settled down on government land without official permission and do not pay any taxes; neither do they settlers get any Municipal services. According to information received from the Khartoum Municipality, there were a total of 820 households and a population of 2650 in all the five Deims of the city.

The selection of the particular Deim, where this research was carried out, was done mainly on its size;it was neither too big, nor too small in size and population, and considering available time, staff and resources, it was very well suited for research. In the Deim there were a total of 90 households; all the heads of the households were interviewed, but, in the final analysis, the questionnaires of two heads of househplds were rejected for incomplete information. Interviewing was done mostly by the students of the Univerisyt of Khartoum in March-April,1969. Besides formal interviewing, there were infrequent visits to the area and informal meetings with the migrants.

The labour migrants in this paper have been discussed from three different angles: Firstly, as migrants, and secondly, as rural and urban migrants; finally, I have also attempted to compare the findings of the present study on the labour migrants with relevant information on the whole of Khartoum and the Sudan whenever those data were available mostly from the two Census Reports of 1955/56 and 1964/65 in order to find out whether migrants of a small selected area in the city under study do show any characteristics with regard to the migrants in general in Khartoum and the "ever - lived - in- the - city" population. It might seem that it is difficult to draw any sustantial comclusion from the results of such a comparasion between a small Deim and the whole of Khartoum and the country. Firstly, because, the labour

migrants in the Deim seem to belong to poorest section of the community in the capital; secondly, in level of education, types of jobs, quality of housing, etc., the Deim migrants seem to belong to the lowest strata of the urban community. However, it was thought that such a comparative discussion on certain general characteristics such as sex-ratio, the rate and source of migration, education, might reveal some interesting information. And the final analysis and discussion of data surely have given us some general interesting information.

A population count done by the interviewers showed that out of a total population of 371, there were 57.1% males and 42.9% females in the Deim. According to the Census Report of 1964/65 which was taken four years earlier than the present research on the labour migrants in the Deim there were about 63% male and 37% female population among the "in-migrants", and 52% men and 48% women among the "ever-lived" population in Khartoum. These figures show, therefore, that the percentage of the male population among both the labour migrants and "in-migrants" in Khartoum is significantly higher in relation to female population than the male population among the 'ever - lived' in the city in general. From the percentage-figures of the male - female population as cited earlier two interesting conclusions emerge. Firstly, the much higher percentage of males in relation to females among the migrants in general than among the 'ever - lived' would strengthen the general hypothesis that a higher percentage of men in relation to women migrate to modern African cities (Little, 1965) (Schapera, 1947); secondly, the significantly lower percentage of males among the labour migrants in the present survey which was carried out about four years later than the 1964-65 Census would suggest that the sex-ratio among migrants to the city is getting lower, i.e., the number of female migrants to the city is relatively increasing.

This is in line with the general trend of more and more women migrating to sity in almost all parts of the world (Davison, 1962),(Fallers,1967). It may be noted that the total 'in-migrants' in the whole of Khartoum accounts for nearly 46% of the population of the city as it is recorded in the 1964/65 Census.

As mentioned previously, in the Deim there were 90 households; all heads of households were interviewed and in the final analysis a total of 88 interviewees were regarded as correct. In calculating the age-structure of the population only the all-male heads of the households provided the information. It appears that over half of the population (55.45%) are under 30 years of age, between 11 and 30 years of be exact, and there are only about 17% between 41 and 60 years. This is surprisingly similar to the percentage of male 'in-migrants' in Khartoum between 13 and 32 years of age.

In the 1964/65 Census nearly 55% of the male migrants are under between 13 and 32 years. The fact that the migrants in general are relatively younger is proved by the relatively higher percentage of the male population in both the present survey and the Sudanese National Census of 1964/65.

In the Deim information on education based on the interviews of all-male heads of households show that nearly 31% have some school or Koranic education. Krotki said that "slightly more than half the adult population has some school education in Khartoum. As expected, the difference between the sexes is striking - 72% with school education among the males and 28% among the females"(1958, 14). The low percentage of adult male population among the labour migrants in the Deim is most likely to be attributed to two things: Firstly, the migrants originally come from rural areas where the rate of literacy is generally very low compared to city; secondly, the higher percentage adult male

population having school education in Khartoum, in general, include the entire population of the city, both 'in-migrants' and the 'ever - lived'; the latter, in particular, is likely to have a much higher percentage of literacy than the others. In the Deim no information on the rate of female literacy is available, but it may be noted that the adult female education in general is very low in Khartoum, only 28% compared to adult male education of 72%. Among the labour migrants in the Deim there were no secondary or university educated, but according to the 1964/65 figures, there was 9.7% secondary and 5.4% university educated among the male population in Khartoum.

Among the labour migrants the average size of the family (in which both parents were present) was 3.9 persons, and the average size of the household was 4.1 persons which was higher than the average size of the family. The size of the family of the Sudan in general was 4.7 persons according to the 1955/56 Census Report. So, the size of the family among the labour migrants in 1969, appears to smaller that the size of the family in the whole country in 1956/57. It is possible that in general the size of the family has become smaller than than what it was about a decade ago. Field-data shows on the average women in the Deim married at the age of 20.4 in the range of 10 to 30. No information has been collected on the age of marriage among men.

Nearly 90% of the migrants appear to have married relatives, Out of a total of 78 married men, a total of 19 or 24,4% married more than once in which, again, 18% married twice, and 6.3% married three times. It could be mentioned here that those who married more than once, did so when the first or their wives were dead or divorced.

In the total population of Khartoum 34% made up the labour force, in which only about 5% were unemployed. This was according to the 1964/65 Census Report. The labour

migrants under study (made in 1969) showed a higher percentage, about 9%, of unemployment than the total unemployment figure for the whole city. This might be due to the fact that a higher percentage of skilled and educated people are found among the total population of Khartoum, which is made up with both 'in - migrants' and the 'ever - lived' in the city population. Among the labour migrants who were employed, 71% were workers and the rest were following sich occupations as gafir (night-guard), murasala (messenger), servant, etc.

The majority of the labour migrants came from the two provinces of Kordofan and Darfur , 53.4% from Kordofan and 37.6% from Darfur. According to the 1964/65 Census Report Khartoum had a migrant population as high as nearly 48% of the total city population of 173,500. Of the total migrants only about 12.6% were from outside the Sudan. The majority of the 'in - migrants' according to the 1964/65 Census Report came from the Northern Province, 43.4% from Northern Province, only 11.4% from Kordofan, 8.1% from Darfur, and the rest from other parts of Khartoum. So it appears that before 1964/65 more people migrated from Northern Province, but afterwards, as it appears from the present study, more migrants are coming from Kordofan and Darfur to the City. It is not known why more migrants are now coming from Kordofan and Darfur and not from the Northern Province.

In general about 76% of the migrants in the Deim have had two years of residence and, out of this a little over 20% have been in residence less than one year. During the investigation migrants reported having left their villages homes as long as 32 years ago. The rate of the flow of migration, during the last ten years preceding 1969, the year when the fieldwork was done, increased nearly 200% from the following ten year period. Khartoum, in general, had an increase of nearly

83% from 1955/56 to 1964/65. Obviously, some parts of the city had more migrants-settlements than others. In the present research, in answer to a question as to why the mogrants originally had left their village homes and had come to the city, the overwhelming majority said that they did so for jobs in the city. But when urban migrants were asked why they left their previous place, about 54% said that they left because of high rent. Among other reasons for leaving the previous places were that the construction work of the houses (where they were working) was completed, or they lived too far from work, etc.

Not all the migrants sever their relationships with their village homes and relatives when they come to city. Our field-data shows that a total of 27, or about one-third (of 88) did go to see their relations during one calendar year preceding the interview. In answer to the question about what they would do if they got, by chance, say, one hundred pounds, the most urgent felt need appeared to be housing.

So far I have discussed labour migrants in general and ccompared som of the findings, whenever possible, with those of the 'in - migrants' and the whole population of Khartoum, and sometimes, of the whole country. Now, it is intended to talk about the rural and urban migrants.

In this paper I have termed those migrants who migrated to the city direct from their village homes as "rural" as contrasted to those who had already lived for quite some time in the city, the same city where they are now but in another area of it or in a different city; I have referred to the latter as "urban" migrants. Among the rural migrants, there were 56% men and 44% women, and among the urban migrants it was 57.6% and 42.4% respectively.

Therefore, though, in general, there were more male migrants than women, urban migrants had a higher percentage of men than the rural migrants; conversely rural migrants had relatively more women than the urban migrants.

Investigation shows (based on the information of the heads of the households only) that the rural migrants are relatively younger than the urban migrants. For example, in the age-group 11 to 20 years, there were 15% (of 32) rural migrants and only 7% (of 56) urban migrants. The rural migrants appear to have a higher percentage of literacy (34.4% out of a total of 32) than the urban migrants (30.35% out of a total 56). This percentage information about literacy is for men only. There was no woman among the heads of households and no information is available on the rate of literacy on women.

The percentage of elementary families is higher among the urban migrants then the rural migrants. The average size of the household (which is the smallest residential unit) among the rural migrants is smaller (3.9 persons), than the urban migrants (4.3 persons). On the other hand, the size of the family is a little bigger ~~than~~ among the rural migrants than the urgan migrants. This might be most likely due to the fact that more single men have migrated to the city.

Rural migrants had a higher percentage of single men. There were 18.8% single and 81.2% married people (men) (out of a total of 32) among rural migrants; and there were 7.1% single and 85.7% married men (where both parents were alive) (out of a total of 56) among the urban migrants. There were no households of "divorced or widowed family"(in which either of

the parents was dead, divorced or deserted) among the rural migrants, but there was one case of divorce and three cases of widowhood among the urban migrants. It is interesting to note that the average age for marriage of women was found to be higher among the rural migrants. Women among the rural migrants married, on the average, at the age of 22.4, in the range of 10 to 30 years, while women among the urban migrants married, on the average, at the age of 18.5, in the range of 11 to 30 years, Though the average age seems to be higher among the rural migrants, yet they start getting married a year earlier (at 10) than the women among the urban migrants. The rural migrants had a slightly higher percentage of men who married more than once; out of a total of 26 married men among the rual migrants, a total of 7 or nearly 27% married more than once, and the urbanm migrants out of 52 married men, a total of 12 or about 23% married more than once.

Among the migrants in general no one was reported to be married more than three times, and it should made clear, that, in all cases husbands had one wife only at a time; they married twice or three times only when they were widowed or divorced. More rural migrants were reported to be married to relatives than the urban migrants.

In our enquiry into the reason for coming to Khartoum the overwhelming majority of the migrants, in general, said that they had come for jobs. But not everyone could get one. There was a higher percentage of unemployment, about21% , among the rural migrants than among the urban migrants who had only one unemployed out of a total of56 heads of households. The The urban migrants were found having more diversified occupation than the rural migrants. Most of the rural

migrants were workers, and a large number, nearly 16% , still continued with the riverside farming. The number of people working as gafirs, tailors, etc.are much more among the urban migrants. Investigation shows that a relatively higher financial need per month among the urban migrants than among the rural migrants.

Field data suggests that the rural migrants were relatively newcomers to the city in comparison to to the urban migrants. A higher percentage (about 40%) would like to return to their village homes, whenever possible, in contrast to the urban migrants among whom only about 18% would like to return. The reasons given for returning to their village homes by both the rural and the urban migrants were mostly bad living conditions and hard work in the city. This might suggest that the urban migrants who had left their village homes earlier and had lived longer in the city somehow adapted to the city living more than the relatively newcomers rural migrants. As mentioned earlier, about one-third of the migrnats in general visited their relatives during last one year preceding our interview.Field data shows that 34% of the urban migrants want to see their relatives in the village as against 24% of the rural migrants. Therefore, it appears, that, for reasons yet unexplained, more urban migrants want to see their relatives than the rural migrants.

This paper does not pretend to be a comprehensive work on the labour migrants in the Sudan; nonetheless, it is believed that such a study will contribute to the need for more research on this problem, and may be used as a guide-line for future research in this direction.

The Democratic Republic of the Sudan today is beginning to experience rapid socio-economic changes. The process of urbanization and industrialization have

aleady affected the Sudanese society and culture in so many ways. When the migrants come to city mainly for jobs, the urban way of life affects their outlook, behaviour, dress, food-habits, etc., and when they go to village (with which a large number of them do keep contact) either for good or temporarily they themselves become agents of change. So far not much work has been done on labour migrants in the Sudan. It is hoped that this study will not only benefit the Sudan but will contribute to comparative studies.

NOTES

(1) About two years ago all the migrants from different Deims, including one where this research was done, in the city have been removed to an area called Green-belt of the city of Khartoum,

This project was financed by the Sudan Research Unit of the University of Khartoum. I am grateful to its Director for financial and other help

I am also grateful to the Municipality and police of Khartoum and must thank them for their cooperation.

I would like to thank my colleahues in the Department of Sociology and Social Anthrc ology at Khartoum University for their valuable suggestions and comments.

I must thank the students of the University of Khartoum for helping me in interviewing and coding of data.

REFERENCES

DAVISON, R. B. 1962 West Indian Migrants. London: Oxford University Press.

DEPARTMENT OF STATISCITS. 1960 First Population Census of the Sudan: Town Planners' Supplement, Vols. I & II. Khartoum: Khartoum University.

1966 Population and Housing Survey. Khartoum: Khartoum University.

FALLERS, L. A. (ed.). 1967 Immigrants and Association. Hague: Mouton.

JANSEN, C.J. 1970 Readings in the Sociology of Migration. Oxford: Pergamon Press.

KROTKI, K.J. 1958 21 Facts about the Sudan. Salzberg: R. Kiesel.

LITTLE, K.L. 1965 West African Urbanization:a study of voluntary association in social change. Cambridge: Cmabridge University Press.

PIDDINGTON, R.(ed.) 1965 Kinship and Geographical Mobility. Leiden: Brill.

SCHAPERA, I. 1947 Migrant Labour and Tribal Life: astudy of conditions in the Bechuanaland Protectorate. Oxford: Oxford University Press.

THOMAS, B. 1954 Migration and Economic Growth. Cambridge: Cambridge University Press.

****

Some Observations regarding the Man-Society Interaction

Mihail Botez
Laboratory for Prospective Research
University of Bucharest

1. I shall start from the simple statement that Man cannot be isolated from Society, and therefore man's problématique[x)] cannot be investigated without covering the social problématique. Even if we distinguished - as does M. Bell de Bal [(xx)] - between man as a product of society and man as a producer of society, we should identify in both images the Man-Society interaction.

If we are to take a sober outlook, man is, obviously a product of the society in which he lives (and which has also moulded him, instilling in him certain values and standards) and, simultaneously, a producer, a creator of society working to improve the society to which he belongs and to contribute to the projection of the future society, while being careful not to block any further development by his constructive over-eagerness. The Man-Society interaction ought to be viewed, therefore, through the angle of a systemic interaction between two systems - Man and Society -, which cannot be realistically investigated in a way other than their mutual relationship.

---

x) We use the term "problématique" in the meaning given by H. Ozbechan.

xx) Europe 2000. General Prospective Studies, Haga, Martinus Nighoff, 1972 (2 volumes).

2.How can the Man-Society interaction (or man-social institutions, the form under which this interaction is most clearly manifested) be identified?

To answer this question we shall review some of the most frequently used manners of describing systems[x)] and after their critical analysis, going beyond the traditional modelling, we shall suggest a different approach, closely related to the well-known "Systems Approach"[xx)].

We shall consider primary notions, the notions of <u>object</u> and of <u>observer</u>. Without going into the details of a philosophical discussion, we will mean, by <u>objects</u>, parts of the reality (either present or past), including, of course, in the reality the multitude of information and of problems being generated by them, in relation with all the possible observers.

A model A^* of an object A, in relation to an observer H is another object which enables the observer H to obtain through A^* <u>information</u> on A. Identifying by $\mathcal{M}$ the set of procedures by which the observer H <u>associates</u> model A^* to an object A, we shall write symbolically

$$A^* = \mathcal{M}(A|H)$$

We shall term $\mathcal{M}$ a <u>modelling operator</u>. The information concept used in defining the model is meaningful only in relation to an observer H.

Formally, this rather confused notion may be avoided, using the mathematical notions of inverse application and of (topological) neighbourhood. If $A^* = \mathcal{M}(A \mid H)$ is the result of modelling, which associates to object A the model A^*, the

x) In this paper, we understand by system a multitude of interdependent elements.

xx) See, for instance, C.West Churchman "The Systems Approach", Delacorte, New York, 1968.

reverse operation by which one passes from an object considered as model A^{M} to an object initially considered, termed $\mathcal{M}^{-1}$ is obviously the inverse application of modelling which we shall call <u>inverse modelling</u>. The development of a whole theory concerning the manner in which it is possible to pass from model to object may be interesting and profitable, involving <u>expression</u> and <u>rhetoric</u> elements. We shall deal with these aspects later on. Let us only mention that the modelling operator is not univoque and that $\mathcal{M}^{-1}(A^{M} \mid H)$, that is to say, the object decoded from observer H in model A^{M} does not coincide specifically with A, but, in general, with other objects $\mathcal{A}$ more or less "similar" to A. From a mathematical standpoint, this similarity or closeness is described by associating a topology $\mathcal{T}_H$ to observer H. Object A^{M} is therefore the model of object A for observer H or $A^{M} = \mathcal{M}(A \mid H)$ if $\mathcal{M}^{-1}(A^{M},H) \subset V(A,H)$, where $V(A,H) \in \mathcal{T}_H$ is a neighbourhood of A suitably chosen by observer H. An <u>observer</u> or a <u>point of view</u> defines then a topology on the set of objects. The description of the entire history, in this formalization, may be profitable for the analysis of continuity and discontinuity concepts in social dynamics, with rigorous diagnosis of the "evolutions" or "revolutions" reported to different social and historic topologies. Space does not permit us to elaborate on these considerations. Let us only note that, from a mathematical standpoint $\mathcal{M}(. \mid H)$ as a function of the object, is an application of set $\mathcal{U}$ of objects, in itself or, possibly in one of its subsets; mathematical modelling is, for instance, an application of $\mathcal{U}$ in the subset $\mathcal{U}^{M}$ of the objects capable of being described by mathematical concepts and

models. By suitably particularizing the set of modelling procedures (therefore operator $\mathcal{M}$) as well as the set of models $\mathcal{U}^*$ and of observers $\mathcal{H}$, it is possible to rigorously define and systematically examine the various types of models used at present, i.e. intuitive models (artistic, sampled, empirical, problem-based etc.) and theoretical models (explanatory, exploratory, normative). The approach suggested by us[x)] permits - for instance in the social field - the unitary study, devoid of artificial frontiers, of the representations obtained through the means of science and art, by experts investigations and by democratic consultation of masses, starting from the states of the art or from their criticism. Large chapters of social research could be formalized in this approach whose development exceeds by far the scope of these lines. Let us only note that the term "information on the object" which we associated to modelling may also comprise elements <u>extending</u> the classical frame of this concept: model A^* is useful to observer H to obtain information on the state of the art of the object A but this information is not always reduced to the mere simplified <u>description</u> of A; it may include for instance systematic <u>avoidances</u> of object A (modelling by absence) deliberately distorted descriptions, in certain senses, of object A (modelling by distortion) descriptions of some partial and intentionally incidental elements of A (modelling by sampling), descriptions of object A by means of <u>responses</u> produced in the observer H (or in a given family of observers $\mathcal{H}$, includ-

x) These aspects are developed in our paper "Principles of Systems modelling" (under press).

ing or not the observer H). The various types of extended modelling are characterized by various types of topologies $\mathcal{T}_H$ defined on the set of objects and various types of modelling operators $\mathcal{M}(.|H)$. An observer H may utilize, in relation to an object A , one or several types of models; the "modelling" application is therefore not univocal. Within the same class of models, we may also consider directed families of models with different levels of association with the object, the meaning of the "association" concept remaining invariant, related to a certain topology $\mathcal{T}_H$ on the set of objects.

From a mathematical standpoint, each observer and modelling type generates, in fact, <u>topologies</u> in the realm of objects, which make possible the assessment of the relation between object and model. However in all these cases, modelling reveals <u>two</u> features which we consider essential: the mandatary inclusion of a <u>point of view</u> in the model (of the observer H) and the <u>monologue</u> aspect of the modelling process which - starting from the object and the observer - consistently develops this point of view.

Let us assume now that we operate in the realm of explicitly time dependent objects A (t) in terms of time - dependent observers H(t) and with time - dependent modelling operators $\mathcal{M}_t$ where t is time; in a more general manner, let us consider that the objects, the observers and the operators, rather than <u>punctually</u> depending on time t, depend on time intervals or on any sets of time moments. If T_1, T_2, T_3, τ are such sets we shall get to the following definition of <u>dynamic modelling</u>

$$A^*(T_1,T_2,T_3;\tau)=\mathcal{M}_{T_3}(A(T_2)|H(T_1))$$

which has the following meaning: $A^*(T_1,T_2,T_3;\tau)$ is the model

of object A monitored over the time-span T_2 by observer H over the time-span T_1 using the modelling operator $\mathcal{M}$ over the time-span T_3, the actual model being constructed for the time-span τ.

For the sake of simplicity of writing, we shall further consider the case in which the time sets T_1, T_2, T_3, τ are reduced to points, to temporal moments; the general case causes only writing difficulties.

It is observed that by suitably particularizing sets T_1, T_2, T_3, τ we may obtain, as particular cases, the <u>historical</u> models of the systems (past or present); the proposed formalization also suggests interesting <u>research themes</u> in social, economic and political analyses. We cite thus the history (the evolution) of modelling operators in relation to a fixed observer - the variation of the <u>form</u> of operators $\mathcal{M}_t, t \leq t_0$ - the history (the evolution) of the models of the same (past) object relative to successive observers with successively simulated modelling operators - the variation of model $A^{*}(t,s) = \mathcal{M}_s(A(t) \mid H(s)), s \geq t$ - the history (the evolution) of the models of the same (past) object, obtained by using the same initial modelling operator, but in relation to successive observers - the variation of model $A^{*}(t) = \mathcal{M}_t(A(t) \mid H(s)), s \geq t$ - etc. These studies may be of interest for the investigations concerning the value dynamics or the sociology of aspirations.

At last, let us mention the fact that the temperature of reality refers only to models involving simultaneous objects and observers; object A(t), modelled by operator $\mathcal{M}_t$ by observer H(t) leads to model $\overset{*}{A}(t)$ and $A^{*}(t)$ in fact, sums up the attitude

of H(t) to the object A(t) (values, etc.), through operator $\mathcal{M}_t$. Retrospective differs from prospective in terms of the meaning given to modelling and to reverse modelling. In a retrospective frame, the model may possibly be confronted with the past object; in the prospective case, any study can be constructed by models alone. In a last analysis, any prospective construction presents the general form

$$A^*(t,\theta) = \mathcal{M}_t\,(A(t)\,|\,H(t))$$

where $A^*(t,\theta)$ is a prefigured element at moment t for the moment t + θ, hence on a prospective horizon θ, starting from a present "pretext" A(t), the present observer H(t), evidently using present modelling techniques of $\mathcal{M}_t$ type. $A^*(t,\theta)$ is however not a model of the reality at the moment t + θ unless

$$M^{-1}_{t+\theta}\big(A^*(t,\theta), H(t+\theta)\big) \subset V\big(A(t+\theta), H(t+\theta)\big),$$

where A(t+θ) would be the "analog" of A(t) at the moment t + θ. Hence it results that the evaluation of any previsional construction, from an axiological standpoint, must include the projection of the future observer (from H(t), to H(t+θ)), hence, from topology $\mathcal{T}_{H(t)}$ on $\mathcal{U}(t)$ to $\mathcal{T}_{H(t+\theta)}$ on $\mathcal{U}(t+\theta)$ and of the future means for the identification and resolution of problems, particularly of the modelling techniques (from $\mathcal{M}_t$ to $\mathcal{M}_{t+\theta}$); in the absence of these elements, we risk to prolong our reasonings in a simplistic manner, with apparently scientific arguments which ignore the very essence of the world "in the process of change".

3. In previous developments, we reduced the modelling process to the "production" of the model by an observer with certain

resources. In reality, things are more complicated. In the first place, the model may express the standpoint of its constructor or may be developed by a group of technicians according to an a priori given point of view; the simulation of several points of view when approaching the same problem is also possible. Therefore the identification and the defining of the observer is not always easy. Second, any model has an addressee, a consumer. Depending on its address, the modelling process makes use of communication techniques of results and of a certain rhetoric of the modelling, whose particular case is what we call the forecasting rhetoric[x]. For the public at large for instance, a mathematical model presented in mathematical language may impose a certain respect; yet it remains beyond the essential knowledge and understanding. An evidence of this fact is the so called "objective nature" which is almost automatically attributed to all modelled investigations, a fact which is so evidently false for the actual constructors of the models. The introduction of the addressee in the model gets to associate to a model $A^{*} = \mathcal{M}(A \mid H)$ a rhetoric operator $\mathcal{R}$ applied to the developed model model A^{*} is thus changed into model $\mathcal{R}(A^{*})$ coded with signs that the addressee can decode. We shall mention the possibilities for distorting and for influenting implied by operator $\mathcal{R}$, particularly when there are common interests or differences between the „addressee" and the „constructor". At last, let us note that the same model A^{*} may be "rhetorized" by different rhetoric operators $\mathcal{R}$. These problems are important in social forecasting (reflexive predictions) and for a rigorous substantiation of the democratiz-

x) Researches in this direction are carried on at the Laboratory for Prospective Research of the University of Bucharest.

ation and of the universalization of forecasting[x)].

4.Even in its most refined versions, the modelling process keeps, as has been observed, the character of a monologue linearly developed, traversing univoquely defined steps (observer - object - model - "rhetorized" model). In particular, this is how a system may also be modelled - the world system, the European system, various national systems, the technological system, the system of relations man-social institutions. A series of widely-spread ideas in the contemporary prospective sociology can be systematically found, following the approach described by us.

We shall mention some of them: the system of relations man-social institutions may be modelled from the point of view of the individual observer, or from the point of view of the kind of observer which is a social institution or a social system; there is a logic of the individual, and there is a social logic; various models are obtained for various types of individuals and for various types of institutions; an observer may simulate - or may be induced to simulate - other points of view than his own, and he may find a rationale for behaviours which go against his own interests but which are results of a certain logic, different from his own; it is here, perhaps, that the key to the understanding of society by man must be sought; finally, a control of the instruments of rhetoric modelling may help in measuring the reliability of the codification and decodification of social "messages" - from man to society and from society to man - which are essential in building that kind of climate of social sincerity

x) At the [illegible] Futures Research Conference in Bucharest, we elaborated [illegible] these aspects in the paper: Perspectives in the forecast[illegible] methodology: methodologic democratization and universali[illegible]

without which the authentic democracy is meaningless.

Could one ever overcome the monologue inherent to modelling? Is there a mean for describing reality and for projecting developments, while preserving the innate tensions of the object and the perpetually new genuineness of the relation between it and the observer?

We saw that the multiple modelling of the same object multiplies its images and enables the dialogue between standpoints. From a formal point of view, this means associating to an object A a family of models constructed by a family of observers $\mathcal{H}$ using a family of modelling operators (and a family of rhetoric operators). The coverage of this multitude of models, be it even linear, really causes a detachment of a certain model, a responsiveness to other points of view, an understanding of the operating mechanisms of the reality which refuses the consecration of the accepted model.

Nonetheless multimodelling remains in the stage of a preprogrammed description of a given reality; and the application of this method to the stage of Man-Society relations and to the projection of these relations postulates, in fact, the same structure of a process having a one way trajectory with an initial point and with a final point. Our suggested approach attempts at formalizing the "continuing debate between various attitudes of mind with respect to society"[x].

The elements replacing the model are :

- a set of observers $\mathcal{H}$ in a continuous change
- a set of modelling operators $\mathcal{M}$ in a continuous

x) C.West Churchman, "The Systems Approach", Delacorte, New York, 1968, p.11.

change (including also the rhetoric operators $\mathcal{R}$)

- a set Σ of rules of the dramatic dialogue, in a continuous change.

We stress that in a very general meaning, the absence of any preestablished rule is, in fact, another rule of the dialogue.

The triplet $(\mathcal{H}, \mathcal{M}, \Sigma)$ defines situations and objects in a different manner than the common modelling. The integration of various points of view (horizontally, vertically - planning levels - temporally - exploratory and normative directions - action - orientation - forecasting as the "inventive core" of planning and rational change processes), the true objective of Systems Approach, is achieved and "spoiled" at the same time, precising, "on the move", the action and decision zones. In this perspective, it is equally justified to start from an object - proposed by an observer as a model - or from another, from the object towards the method or from the method towards the object, from the observer towards the problem or from the problem towards the observer[x].

The relation between the developed models and the observers is a relation of a continuous dialogue; a constructed model begets reactions and asks for its updating; the criticism of other

---

x) The Laboratory for Prospective Research of the University of Bucharest have developed a collective construction methodology of models, integrating survey techniques and traditional modelling procedures; the model obtained is thus a synthesis of models issued from various point of view, in a variety of types, arrived at by different means, coded and decoded according to some general techniques and integrating thus the diversity. Applications of this approach (wich we would like to call "Bucharest approach") are in the process of being worked out for the study of international relations (metric of international relation, bilateral cooperation, metric of security, etc.). This is an attempt at constructively outpace modelling, which we intend to bring closer to the systems approach by the operational introduction of the techniques of the continuous dialogue and of the permanent reconstruction of partial models.

observers perfects its definition; no conclusion whatsoever appears; the distressing unanimity and full agreement gives way to stress and continuous dispute. The formative role of such an approach may be more important than its informative role, and may be, a whole psychology of change having an operational character may be outlined on this bases, leaving behind the metaphors and the statements in principle.

I feel that were these man-institutions social relations placed under this angle of research, the possibility would be opened for a real correlation between understanding, exploration and action.

An incendiary atmosphere of strongly individual models and counter-models, both contesting and completing each other, is the natural environment for the development of a new critical spirit which outdistances the modelling classicism. And a concerted, scholarly uncoordinated action starting from debates such as those carried out at the Conference on Human Needs of the New Societies and the Supporting Technologies, may mark a real onset in this direction.

THE CREATIVE DYNAMICS OF ADVANCING SOCIETIES

by Arthur B. Bronwell
University of Connecticut

Civilization's progress has always been a stumbling, bumbling, haphazard process. During the past half century nations have been forged into their contemporary forms, largely as a consequence of cataclysmic wars, social upheavals, economic depressions, racial crises and innumerable other tumultous and disastrous episodes.

Dean Langdon Gilkey, of the University of Chicago's Theological Seminary has observed that basically man is not a logical creature. This I should like to use as my point of departure. Man creates logical institutions and systems in order to endow himself with great power. Then along comes World War I or World WarII, or the Vietnam war, or an economic depression, or a smashing social rebellion and the logical systems suddenly become illogical. Many of society's most cherished foundations collapse, to be superceded by a whole new structured concept. So often social systems have limited lives. Invariably there comes the catastrophic moment when logical systems suddenly collapse and become illogical and destructively obsolete. An entirely new concept with a higher order of logic becomes imperative.

The author's forthcoming book: The Creative Society - Democracy In The Twenty-First Century deals with the character of change that is likely to develop during the next half century. The philosophical basis of this was set forth in a chapter on "The Creative Society" in a previous book, "Science and Technology In The World Of The Future," A.B. Bronwell, Editor, John Wiley and Sons, 1970.

And we ask ourselves why was all of this monstrous nightmare necessary? Isn't it possible to generate a higher order of wisdom so that societies might make orderly transitions and concentrate their creative energies on the things that really count most in the long run in building civilization's culture and its humane progress? There is certainly no assurance that nations which have been forged in blazing infernos of social upheaval or world conflict are the better for having been dragged through this ordeal. Historically, many nations and civilizations have expired as the consequences of such collisions with destiny.

In all of our universities, our learned societies and our intellectualism, we study logical systems, shaping them here, modifying them there, adding and deleting and shifting the emphasis. We computerize our economics, and seek social indicators and technological forecasting to tell us when things are getting out of balance politically, socially, technologically, or economically. This information is then fed into the machinery of political, social or institutional change. It lacks precision, to be sure, and there is often a long time lag before change takes place. But by studying the system in great detail, hopefully it can be modified on a continuous, rolling adjustment basis.

Then suddenly there comes another cosmic collision with destiny, and the logical rules once again go out the window, as nations start all over again to rebuild. This suggests that we ought to be studying not logical systems, but rather illogical systems. Logical systems are always built upon an ideology and a structured framework of beliefs. If there is any lessom to be learned from history, it is that ideologies

have limited lives, and then they collapse. They are superceded by seemingly illogical systems of ideas which sometimes prove to have in them the seeds of a higher order of logic.

This paper will deal with illogical dynamic systems and how they affect what I shall call the creative dynamics of advancing societies. I am using the term "creative" here in the broadest possible generic sense to encompass the advance of culture and of socio-economic progress, as well as the moral and spiritual uplift of society, admittedly a very large and cumbersome package. But to attempt to break it down into segmental parts would lose the essence of the argument.

The Last Gasp

Civilization moves forward on ideas. The dynamics of progress of nations and their abilities to control their destinies depend largely upon how they deal with ideas. Advanced societies can be philosophically expansive. That is, they can sustain high levels of creative dynamics and high impulse momentum through optimization of their idea-generating and developmental capabilities. Or institutions and societies can fossilize around existing idea structures and ideologies, and thereby fail to understand the character of change that is developing. Such societies are destined to move from catastrophe to crisis along paths of uncertainty and anguish.

As Executive Secretary of the American Society for Engineering Education and editor of its Journal early in my career, I developed strong convictions that the ways in which institutions deal with ideas are far from optimum, and that this severely retards the whole system of the generation and development of important ideas, and their emergence

into the mainstreams of society.

If the institutions of an advanced society are not adequately mobile and philosophically expanding, then they impose a ceiling on a nation's creative powers. This may bring about the inability of society to sustain high creative momentum and to be master of its own destiny.

"The last gasp of dying civilization," said Spengler, in a prophecy of the ultimate decline and collapse of Western Civilization, will be the "refinement of techniques." This is the stage at which everybody is working on the small challenges and problems because the big ones have grown far beyond man' comprehension or ability to do anything about them.

We know very little about how to identify potentially important ideas early - how to find the golden nugget in the haystack. Furthermore, even after important ideas are brought into clear focus, it sometimes seems that all of heaven and earth is dead set against even exploring their possibilities. For example, Woodrow Wilson's idea of a League of Nations that would bring the nations of the world to a common forum where their differences and grievances could be aired, and which would have a peace keeping force and judicial apparatus, was rejected in the United States senate, thereby giving it the kiss of death. It took a second world war almost a quarter of a century later, with its cosmic collapse of mankind's societies and his dreams, to prove that Wilson's idea had universal validity and was destined to become an accepted part of the thinking of all nations and all people.

This "inversion syndrome" where the ideas of greatest ultimate consequences are surreptitiously rejected, while learned societies are overwhelmingly preoccupied with currently visible desiderata has plagued all professions, not only science and engineering, but all of the social sciences, the humanities and the fine arts as well. We simply don't know how to identify the embryo ideas that may have transcendent ultimate importance and how to lift them out of the crowded thoroughfare so as to put them on the expressway for expeditious development and infusion into the mainstreams of civilization's advance. The more prodound the idea will be ultimately, the more certain that the discoverer will be destroyed in academic and professional circles.

Achieving adequate philosophical dimensionality may well be the most important ingredient in civilization's advance. Furthermore, some highly successful methodologies are evolving to bring about the philosophical exploration of ideas far beyond the contours of present-day knowledge.

Professional - Political Relationships

There is another matter of supreme importance which determines whether a nation will be able to deal wisely with its future. This is the relationship between the professional and political sectors in the policy and decision-making processes of government.

Advanced nations all have a propensity to develop a deep schism between the intellectual and professional sectors of society on the one hand, and the political controling elements that are shaping the destinies of nations on the other. In this heirarchy, professionalism at its ablest and most experienced levels is usually relegated to subordinate position,

often below the level of political machinations. Excepting as it agrees with political ideologies, professionalism has little influence in shaping society's evolution or the overall destinies of civilization's advance. Throughout history, tragedy has stalked the trails of ignorance. Nations so often travel the paths of highest conflict and least efficiency. They do not take kindly to drastic changes in their conceptual frameworks. So often institutions, governments, societies and nations just don't move until the get clobbered - then it is too late.

Unmistakably, we are evolving toward a more philosophically oriented society. Suddenly we find that civilization's advance and the stability and peace of the world hang by perilously thin threads of knowledge of how to deal with the dynamics of change. Each discipline of knowledge of half a century ago has exploded into vast galaxies, all separate and distinct. Continued subdivision, driving the pursuit of knowledge farther into the catacombs can be a self-burying process unless it is countered with a proportionate and adequate development of philosophically projective scholarship. This philosophically projective orientation is destined to drastically reorient universities, learned and professional societies, and in the larger perspective, virtually all of civilization's advance. It will requires entirely different kinds of institutions, different idea logistical methods, different organization of learned and professional societies. Beyond all doubt, this transformation in the way that we deal with ideas will be one of the most profound evolutionary developments during the next quarter century.

The fog is getting much thicker as our bodies of knowledge grow astronomically and as the convolutions of the social-political forces of nations and the world become impenetrably more complex. Nations with their backs to the wall, slashing away in rear-guard battles on catastrophes that should have been anticipated and forestalled many years earlier, are not likely to bring forth a great culture or sustain high morality and idealism in its social milieu. Nor can they, in fullest measure, carry forth the torch of civilization's advance.

Conclusions

It is timely that we undertake a direct frontal attack on this whole exceedingly complex subject of the Creative Dynamics of Advancing Societies. We have been avoiding it because of a dangerously false bugaboo that we can't research the future - so we had better stay out of it. But we must replace this outlook with a concept that will most certainly underly civilization's advance in the future, that there is a philosophical world of ideas that is infinitely larger than the pragmatic real world that we know so well.

Youth senses this closing-in of its creative horizons. They sense that not only the population explosion, ecology ceilings, energy crisis, and depletion of natural resources are closing in on their creative opportunities, but of vastly more profound importance, the system of institutionalized society is developing disturbing geriatric characteristics. To many of them, the future just isn't going to be as creatively exciting as the past, when all of this institutionalized society was being created. There isn't much romance in sweeping up the garbage after the ball is over. And this, I believe, underlies a great

deal of the social unrest that is developing among youth world-wide. They are battling against institutionalized systems which preserve the ideologies of an antique world, and which seemingly have no way of breaking through to create a new kind of world for tomorrow.

It is becoming abundantly clear that the world will change swiftly and drastically in the decades ahead. This will call for the philosophical interplay among highly creative and innovative minds in the largest domains of thought. It will require institutions of all kinds, including universities, learned and professional societies, industries, governments and international institutions, to develop far more fluidity, mobility, and adaptability than those which presently exist.

In brief, we are entering a philosophical era in which the pragmatism and materialism of the past must give way to a much larger concept of civilization's advance. It must deal with the nobility of ideas and ideals, and open the floodgates to the limitless creative talents of youth in every field of man's cultural, social, economic and political advance. The character of the times demands it, the accelerated tempo of the future will thrive on it, and the creative instincts of man will welcome it. We are dealing here with the most unique of all of nature's creations - the human mind. The creative mind can rise above society only if it can find visions of the future, outlets for its creative expressions, and the ability to reshape the institutions of society toward a fuller and better purpose.

Acknowledgment: The author wishes to express his gratitude to the U.S. Office of Education and the National Institutes of Health for financial support in a portion of this project.

ARE WE FROGS?

By Rachel Elboim Dror
Head, Division of Educational Planning
and Administration, School of Education
The Hebrew University of Jerusalem

"Frogs will permit themselves to be boiled to death. If the temperature of the water in which a frog is sitting is slowly raised, the frog does not become aware of its danger until it is too late do to anything about it." [1]

This paper is in a way a plea to the participants of this conference to realize that the temperature of the swamp of education is reaching very high temperature. We are already so deep in the danger zone that if we will not undertake immediate and radical measures to change the system, our good intentions will soon lead us to boil happily.

Regarding education as the solution to many of society's ills and deficiencies is a very fashionable attitude. We believe that if we put all children together through the same grinder, they will come out as well-meaning, equal citizens of the democracies of tomorrow. To make this grinder do its job we pour astronomical amounts of money into it and wait for the miracle to work.

Let me, in this short paper, outline briefly where we are heading as a result of present trends in educational administration, and then sketch some needed changes.

Where are we heading? In answering this question, let me concentrate on one phenomenon namely the development of a dichotomy of "two cultures" in education.

The Development of "Two Cultures" in Education

For many centuries, we had only "one culture" in education, that of

the educators. These were not so brilliant people, the mediocre, to some extent you could even say the failures, the left-overs from other professions. Or they were the social climbers, the mobile strata rising from among the skilled labour, farmers and shopkeepers. And of course the women.

It is a culture of conformity, bound to the past and to tradition, it is a culture of maintenance, of passive transfer of the available knowledge and values. Such a culture breeds impotence in regard to planning and management of its own affairs. As a result, the structure, organization and administration of schools did not change much from the days of the Roman Empire. In this culture education seems to grow unplanned, unsystematic and uncontrolled. Its goals and objectives are determined by implicit feelings and its achievement cannot be objectively defined. Its development and resource allocation is the result of a compromise reached by a struggle among different pressures and interest groups, without the benefit of a comprehensive and systematic analysis.

But at long last we are lucky for a "new culture" is developing in education. With growing awareness of the role of education in economic development, in social unrest, in changing the quality of life and as a change agent of society - on the one hand - and the incompetence of the system to achieve its goals and manage its affairs on the other hand - education became a central issue in many social and economic programmes and political campaigns. This new emphasis on growing demands for education and its novel role in contemporary society, increased tremendously the resource allocation for education. Huge amounts of money are now spent not only on the maintenance of the system but also on research and study of its management.

These newly acquired respectability, importance and affluence, are responsible, in part, for the development of a "new culture" in education. Mathematicians, sociologists, economists, subject matter specialists, management experts, statisticians, systems analysts, engineers and other professionals, as well as consulting firms and think tanks, became aware of the old field of education and its new potentials. Budget cuts and unemployment among certain categories of professionals, sharpened the competition for a share of the education money.

The meeting between this "new culture" and the "old culture" of education is most interesting to observe. It seems that the reaction of the old-timers oscillates between two extreme attitudes of either complete denial and rejection, or complete submission and acceptance of the new gospel. But a real confrontation between the different attitudes, values, methods and work techniques of the two groups - is lacking.

Great hopes arose when the "new culture" began to develop in education. Everybody felt that it is high time that something should be done about education. But the new specialists who came to lend a hand to education suffer from the blinding effect of their former occupations. They bring with them a predisposition to look at education from a narrow and monolithic angle. Instead of taking a fresh look at education, study the field from within and trying to understand the intrinsic values, orientations, methods, constraints and characteristics of education - the new specialists come to look on their new field of inquiry within the procrestean bed of their former perceptions and frames of reference. They approach the task with the simplistic attitude that what worked well in industry, in defence, in engineering, in other

branches of government, is sure to work well in education. It is all just a simple matter of transfer of technology from one area to another. Thus, instead of being an advantage their former successful experiences become a serious barrier. Instead of sensitizing the new specialist to the differences and to the need for flexible application of their methods and the necessity to develop new methods to fit the special characteristics of the education system - their trained and experience generated incapacities cause them to adopt an oversimplified image of the phenomena they are dealing with, so as to suit their methods.

Thus, for instance, most of the efforts of the "new culture" in education, are directed at problems that deal with resources, mainly inputs of money and family background of students; some efforts are directed at outputs, as far as these can be quantified and measured by conventional available methods; but nearly no efforts are directed at the problems of the throughputs (which tends to be regarded as a black-box transformation function). The education process, by which the inputs interact, are reorganized, and ultimately transformed into outputs, remain completely the dark, closed box which these analysts do not want and are unable, with their present tools, to open. By operating on the basis of the input-output and blackbox model, the "new culture" does not have to learn and understand the education process and thus it remains blind to education's characteristics. There may also exist an implicit notion that education does not really differ so much from other processes. In any case, the accepted notion is that as long as you can influence and control the outputs by manipulating the inputs, why bother to look at the dark box. What this notion fails to see is that some of the problems in the outputs which they are trying to tackle may

result from faults in the processes of the throughputs. As long as they do not try to understand what goes on in the blackbox of the education processes and to change it, the efforts of the new experts are to a large extent sterile.

To some educators of the "old culture" the "new culture" specialists became the Beautiful People of education (or should I rather say the wise whiz guys) to be imitated and worshipped without reservation or criticism. Thus an anomic ritualism, as Merton has labelled it, developed in education, which causes many to become narrow rationalists, to preach about "goal-free evaluation",[2] "management by measurement", and Planning-Programing-Budgeting (P.P.B.) as the salvation from all of education's sufferings. Anyone who does not speak of systems analysis is "out". One is a little more careful about programme budgeting as this requires some technical knowledge and therefore is not so safe a word to drop in a discussion. The real prestige goes to those who have the technical knowledge of how to deal with subjects such as quantitative techniques for educational planning and evaluation, or mathematical programing models to optimize whatever it might be. These are sure "ins". "In" to get money for huge research projects and "in" for professional recognition.

So it seems that not enough efforts are made by educators to develop new theories and methods to deal with the problems of planning and management of the education system or to adjust existing methods of policymaking, planning and administration to the realities and needs of education. Rather, a competition exists who will be the first to preach and spread the new gospel among the devoted. It is impossible to escape the feeling that education is becoming more and more a completely other-

directed endeavour, which eliminates and suppresses its own special characteristics and inner-directed ideas and values.

It would be misleading not to acknowledge some contributions of the "new culture" to education. As education became a big industry, many new and important projects are developing in the area of evaluation studies, budgeting, educational planning, the use of computers for education, equal educational opportunities and achievements, to mention just a few. The technologies of dealing with such subjects are improving and more and more bright young and agressive professionals are getting interested in applying their methods to the rich soil of education. The outcome is more and more sophisticated studies from the point of view of rigorous analysis and statistical methodology. The trouble is that after you take off the sophisticated crust of objective analysis and incomprehensible mathematical language, the questions that are asked and the answers that are given are very disappointing. The main danger is that better narrow technologists without systematic and broad examination of education as a whole and its goals may in fact aggrevate mistakes and do more harm than good.

Educators are so overjoyed that they too became respectable, rational, measurable, and mathematically analyzed - that they too become obsessed by narrow and limited approaches, where data is relatively easily available and easily quantified. Educators forget that the "ability to quantify and make precise measurements is less important than discovering the right thing to quantify - i.e. finding the signifcant questions to ask of experiment and observation."[3] The situation sometimes reminds me of the unbalanced growing of an adolescent who may at a certain stage be very mature intellectually but is still a small

child emotionally and socially.

It is interesting to note that the more technically professional and analytical education becomes, the more it seems to prefer to deal with training and instruction, with well-defined and short-range objectives, rather than with the ill-defined, long range, diffused and loose goals of education as transmission, renewal and creation of values. This attitude for "clean science" is described by a noted Nobel Prize winner scientist as follows: "Not even the possession of university Chairs gave many the assurance to do clean science; some actually wasted their efforts on useless polemics about the origin of life or how we know that a scientific fact is really correct...All that most of them wanted out of life was to set their students onto uninterpretable details of chromosome behaviour, or to give elegantly phrased, fuzzy-minded speculation over the wireless on topics like the role of the geneticists in this transitional age of changing values."[4]

It seems that education has been penetrated by unloving lovers. They are attracted by the vast resources and opportunities the field is offering, and its growing importance, but their allegiance lies not with education but with their former technologies. They do not call themselves "educators" and do not want to be identified with the traditional connotations that go with it. They want to use education for their own purposes and of furthering their own disciplines. It is an unkind love relationship. Though it lacks warmth and mutual respect, it could develop into a fruitful and productive relationship, if the invaders would be less rigid in their devotion to their technologies and more open-minded towards the phenomena of education.

My somewhat one-sided view is doing an injustice to many concerned

scientists and men of action from different disciplines who devoted their time and talents to education because of deep concern and a sense of responsibility towards the education system. I do so for the sake of briefness and the need for a simplified black-white picture so as to bring the message home clearly; and not because of lack of appreciation. It also is unfair to focus criticism only on the "new culture" for what it has done for education, even if in a limited and partial way, rather than also and even more so criticize the old culture for what it has failed to do.

Lately, we witness some kind of revival of the "old culture" of education, namely, a plea for humanizing the education system and its processes, or bringing back spiritualism into the rational scientific world of the "new culture" of education.

It is difficult to deal with this plea for "new consciousness", "spiritualism" and "humanism" because of its diffuseness, its metaphysical character and its mystic connotations. Leaving these concepts in their primary undefined state, does not permit a serious exchange of views, nor a responsible choice between competing and conflicting approaches and goals. In order to have an impact on the education system, there is a need for better definition of concepts and ideas, a need for explicating the implicit feelings, values and biases that lie underneath many of these ideas, and a need for developing new methods and new tools of analysis to fit as yet unmeasurable variables.

Futurists must become aware of this state of affairs in education if they want to look for useful ways to bridge the Cartesian dichotomy of rationalism and spiritualism.

What Should be Done?

I do not intend to provide in this chapter a new message. Rather, I would like to state some needed changes, changes which we all may know about and yet do very little to bring about.

Education has long become a scapegoat for all of society's problems and miseries. A society torn between conflicting goals and half-truths, stumbling in the darkness to find its mission and to understand its purpose - expects one of its weakest organizations, the education system, to preach the truth which society itself did not yet find, to bring equality to an unequal society and to lead its youth on a clear path when the roads are all blurred.

This is not only an unrealistic expectation, but an impossible mission. The result of this approach is the feeling of hypocrisy among the young generation, which furthers their alienation.

I would like to outline some of the first steps that should be taken in order to break through from this frustrating situation.

First it seems to me that we must break the artificial walls we created between school and society. We have to abandon the naive and shallow concepts of schooling as the first and last phase in human careers, which prepares them for life in an adult society; a phase supposed to give them all answers to fundamental questions and the skills to pursue their chosen vocations. I will not go into the limitations of this traditional concept of education and its biased view of the world as a static, certain, secure and unchanging place. There are voices lately which eloquently express their views on the insufficiency of the traditional concepts and structures of education. From many points of view - psychological, biological, the advancement of science, the

rapid rate of social change, and many others - the first fifteen or twenty years of life may not be the optimal period for schooling and certainly not for constituting the final phase of it. There are many thoughts expressed and even some programmes planned for recurrent education, in-service training, mid-career changes, vouchers for education, alternative ways of schooling, deschooling, etc.

What I would like to stress here in this respect is the need to abandon the concept of education as the organization which has answers to be transmitted to the young generation, and to begin to approach the education system as an integral part of a society which looks for its, as yet unclear, ends. This very difficult process of search, of trial and error, of uncertainty, must become a central part of schooling from the very beginning. Education for uncertainty is a very difficult task indeed, because it requires tolerance of ambiguity, but it means openness, flexibility, and free choice. We do not know what the purposes of life are, we are not sure how to bring about an equal and just society, and how to raise the quality of life. We should invite the younger generation to share these uncertainties with us and to search for novel solutions. There is much more hope in this partnership than in the hypocritical role we now assign to education. If there is uncertainty, there is also freedom to try and experiment, there is a wide range of alternatives to be tried, there are choices to be made and a need for responsible decisions.

The second point I would like to stress is education for responsibility as a central end of the process of education. Two developments made education for responsibility a critical component. One stems from our previous discussion of changing the role of education from

concealing uncertainties to sharing uncertainties.

A society that is conscious about its uncertainties and allows freedom to experiment and try out different alternative ways of living, may become an anarchy Safeguard mechanisms against such developments have to be prepared beforehand by educating members to make responsible choices and be ready to take responsibility for their own decisions.

The second development which calls or education for responsibility as a central aim of the process of education, is the development of our post-industrial service society, and the growing interdependence of organizations and individuals. The fact that we are now entering a new phase in our social-economic development is well-known and discussed by economists and sociologists. In this service society the dependence of each one of us on other individuals and organizations is reaching a new and - till now - unknown and unimagined intensity. There will be no islands left, not self-sufficient individuals, groups or organizations. In this complex, interdependent service society, each individual become weak and insecure, because his well being depends on the professional knowledge, skill and goodwill of other individuals who render him their services.

All the efforts of our present existing education system are devoted to raising the level of the service rendered by training better professionals who possess more and more knowledge and better skills, but very little is done to educate for responsible service beyond the limited legal-professional responsibility - responsibility towards other human beings and not only towards clients. Our schools train better and better service machines, but not service providers.

How narrow our concept of responsibility has become is exemplified

by the reduction of people to taxpayers. Whatever the discussion may be about there is always bound to be someone who gets up and says "the taxpayer has the right to know what is done with his money." Against this right and responsibility of the taxpayer, there is no defence. People as people have no right to know how their children are educated, how the government is run, how the municipalities plan their cities. Only taxpayers have the right and responsibility to know.

The third point I would like to mention is the need to break away from the monotony of our methods and organizational structures in education, and the need to develop many different alternative ways of schooling. In all our societies there are accepted moulds for education, diversity is nearly non-existent. One could enter any school, anywhere on this globe, and find his way right away along the corridors, the standardized classrooms and desks, the always present groups of thirty to forty pupils and one teacher. Structures, methods and technologies take precedence over our ends and aims. First, we build schools, with twenty, thirty or forty symmetric rooms within it, then, we furnish them with the same desks and chairs and blackboards. Methods of teaching to fit such structures and equipment follow while aims and ends are taken for granted and as self-obvious. Thus structures and methods force on us the solution of problems, relationships, and aims. Many alternatives are closed, even before they can be examined and discussed.

The fourth point to be considered is the need to develop new methods and channels for recruitment of personnel for education systems. No matter how good our plans for changes in the education system may be, we can be assured that we will not accomplish any real change as long as the people responsible for the education process will remain the

sam

This does not mean that all educators are incompetent and should be dismissed, but rather that the system should be opened to many different types of people, people with different backgrounds, different training, different experiences and different systems of belief.

The rigid entrance procedures existing now in nearly all countries, that allow only people who are trained in teachers' institutes or in education departments of the universities, to practice teaching and become school principals, create a closed and barren system.

The fifth point I would like to mention is the need for a more sophisticated management system for education. Schools today have a very simple, symmetric and standardized organizational structure, and therefore can be managed even by the managerially unqualified teaching personnel. Developing new alternatives for schooling, increasing the diversity of school aims, structures and methods, recruiting heterogeneous groups of different professionals to work in the educational system - all these will require a highly sophisticated managerial system that will be able to cope with complex problems of coordination, planning, decision-making, communications, and feedbacks.

Last, but not least, one should mention the need to change the reward and punishment system in education. In order to facilitate new experiments, to try new ways and to search for new solutions, one must be allowed to make mistakes. At present the reward and punishment system administered by the education management system encourages conformity and rewards those that just keep the boat from rocking. Trying new ways means taking risks and making mistakes. If the management system will not be open-minded and willing to take such risks and encourage

deviance, creative people will flee the education system looking for more freedom outside the conforming system.

Speaking about the need for immediate and radical change in education, I cannot escape the feeling of the child who shouted "wolves, wolves" while people laughed, because he used to do that so often, and they stopped believing him. Till one day the wolf really appeared, but no one was ready to face him.

Footnotes

[1]Robert Theobald, What New Direction for Society? Los Angeles Times, Sunday, May 24, 1970, Section G-7

[2]See Michael Scriven, "Pros and Cons About Goal-Free Evaluation," Evaluation Comment, The Journal of Educational Evaluation, Center for the Study of Evaluation, UCLA, vol. 3, no. 4, December 1973, p. 1

[3]Pfaffman, as quoted by W. I. Jenkins and I. Velody, in The Social Sciences and Government: Do the Natural Sciences Show the Prescribed Path?, Paper presented at a seminar on Social Science Policy at Loughborough University of Technology, 1968, p. 17

[4]James D. Watson, The Double Helix, The New American Library, 1968, p. 53

EXTRACT FROM THE SEPTEMBER-OCTOBER 1972 ISSUE

"SCIENTIA"

(RIVISTA DI SCIENZA)

Rivista Internazionale di Sintesi Scientifica - International Review of Scientific Synthesis

B. de Finetti

PREJUDICE AND LIBERTY

PREJUDICE AND LIBERTY

1. - THE URGENCY OF THE PROBLEM. — The initiative taken by «Scientia» for a debate on such an important and difficult problem is yet one more proof of the journal's seriousness and foresight. This discussion should not only develop along the lines of encouraging scientists to express and compare their ideas and convictions but also leave the sheltered world of the experts for open discussion in the press, thereby succeeding in interesting and firing the public at large, promoting in them watch-fulness and awareness of the gravity and difficulty of the problems which face us.

They are in fact problems which concern us all and must be carefully examined by all, in complete contrast to what seems at present to be the almost universal attitude: the tendency of almost everybody, illiterate or educated, blinkered or broadminded, ignorant or academic, to accept irresponsibly the existing situation and development, with all the distortions of today and the threat of even worse disasters which they portend in the minds of those who are not or refuse to pretend to be blind.

To pretend to be blind in order to avoid worrying might even be wise if the evils and threats were both incurable and inevitable: where there is absolutely no possibility of remedy or defence, one might prefer light-hearted fatalistic resignation to premature despair. What else could one do should the earth be threatened by collision with another celestial body?

The distortions which afflict us and the threats which weigh us down, however, are not beyond the range of the intelligence of man, or indeed scientific knowledge and the technical applications of that intelligence, providing we have the will to behave intelligently. Remedies can be applied, or at least one can and indeed must study whether and how such possible remedies exist or may be created. Dangers can be averted or at least one can and must look for possible ways of averting them. Then one must not forget that indeed many of the distortions and dangers are caused by man himself through narrow-mindedness, ignorance or lack of foresight, and in these cases one can simply stop creating and perpetuating them by choosing harmless alternatives-or at least as harmless as possible.

2. - THE ROLE OF SCIENTISTS AND TECHNOLOGISTS. — In our struggle against the distortions and dangers, we shall need, as mentioned above, every body's wholehearted concentration and commitment; and furthermore the opinion of all must be sought for a consensus on the best balance to be made between immediate sacrifices and future benefits.

But the possibility of analysing the situations, of diagnosing the dangers, of outlining and comparing new hypotheses and of arranging methods and criteria to carry them into effects are tasks which require the mind and ability

of all scientists and technologists because we are dealing with tasks and fields of research and planning which, more typically than all the others, require the cooperation of all branches of learning.

To develop these qualities and prerogatives and to carry out the tasks which can of necessity only be carried out by them, scientists and technologists are in just the same position as every-one else, except from the point of view of their particular know-how. The commitment which is required of them in the interests of the common good is exactly the same as that required of everybody else, with the same rights and the same obligations. An essential condition for the correct carrying-out of their function is precisely the exclusion of any risk that they may more or less intentionally, or perhaps even inadvertently, find themselves like gnomes shut up in a dismal pentagon, in a position to choose off their own bats not only means but also ends, which is certainly not their duty or their concern. None the less, it is certainly their duty to enlighten the public on the choices to be made, giving objective information on the pros and cons of each alternative and of the respective degrees of risk involved, forcing themselves to break down the normal squalid and obtuse temptation to conformity and the conventional wisdom, to conservatism and masterly inactivity, and therefore to more and more backwardness.

It is in fact above all the scientist's duty, but, at least in part, also the duty of technologists and thinkers, to cultivate, defend and support the very precious quality of openmindedness; naturally an openmindedness which enables one to see things clearly in perspective without submitting to the tyranny of commonplaces and conformist conditioning and certainly not one which consists in unscrupulously following one's own petty interest.

It is this openmindedness which enables one to imagine things which at present do not exist, and which indeed normally have never existed, and which perhaps have up to the present time never been imagined by anybody else; this openmindedness enables us to compare these things with others already existing without submitting to the common suggestion of considering the new idea as utopistic in a disparaging sense, or at least as less realistic or less realisable than what is today - perhaps mistakenly, unfortunately and unpleasantly - reality.

3. - Commitment for liberty within the sciences and outside them. — This same desirable quality of open-mindedness should save every scientist from intolerance so that he is always amongst the ranks of the defenders of liberty and freedom. This is naturally also the case when intolerance strikes at people and ideas with whom and with which he disagrees; we are all capable of doing the contrary including, and especially, the intolerant.

There are many aspects and problems both in the field of thought and action (some in all countries, others only in those countries with totalitarian régimes of one sort or another) which are still today subject to various forms of oppression or conditioning, whilst a more or less radical liberalisation is to be hoped for and would appear wise.

It is useless to waste time giving examples on which in general everybody would probably be in agreement; it would nevertheless also be intolerance to maintain that all should be obliged, instead of being able to choose for themselves according to conscience, in each individual case.

But one liberalisation which is too prejudicial for all the others, for anyone

to permit himself to lose interest in it, is a liberalisation in the field of information; effective freedom of information, of being able to spread any and every opinion, and therefore of discussion and reflection, is a necessary condition, and, if well used, sufficient, for all other problems - in the first place those concerning other types of liberalisation - to be thoroughly examined, evaluated and resolved in accordance with the opinions and motives for and against which emerge from their discussion.

Scientists should take part in this discussion in order to enlighten others on the basis of their knowledge and individually on the basis of convictions which they themselves have worked out. It will be no bad thing if they have even partially different opinions, for this would at least help us to see the essential and effective nature of the question by making a clean sweep of all those inexact, superficial or distorted arguments which normally influence the general public.

Still more directly, freedom should be the rule within the scientific and teaching fields, permitting new ideas - which may at first seem both revolutionary and unpalatable - to be understood, welcomed, known and judged without running up against the dogmatic tyrannical taboos of the academic mafia. In any case, however, every scientist or scholar should always have the courage and the honesty to expound and defend his own hypotheses and ideas-providing they have been sufficiently thought over and considered, and providing they are prepared to recognise their possible falseness or erroneousness- without undue sense of reverence.

4. - A FEW MORE OR LESS RECENT EXAMPLES. — For example, Bolyai and Lobacevsky gave adequate proof of such honesty and courage when, young and unknown, they published their discoveries on non-Euclidian geometry, whilst Gauss, already a celebrated leading mathematician, although having obtained similar results had kept them secret in order to avoid « any furore ».

And yet it was not, as it had been for Galileo, a question of challenging the « Ipse dixit » of Aristotle with the risk of being burnt at the stake as guaranteed to him by the Church, always inexplicably prone to link the logical defence of her theological truths to that totally unsustainable defence of conceptions and institutions superseded in every field, from the philosophical-scientific to the political-social. For Gauss, it was only a question of challenging the « Ipse dixit » of Kant, and only risking a reprimand from the Establishment, which was naturally satisfied by the new bastions of a priori certainty based on perfected sophisms in whose mists Kant had prudishly veiled the liberating revelations of Locke, Berkeley and Hume.

Only recently, for example, in the heated discussions against the theory of relativity and against the indeterminism of quantum physics one saw, mixed up with serious arguments and excusable misunderstandings, preconceived opposition tied up with metaphysical taboos. Certainly, sometimes there is quite objectively the risk of mistaking the protagonist of a new idea or hypothesis - exact or not will be seen later, but in the meantime well worth examination and discussion - for a simple charlatan. And perhaps in this sense one can concede extenuating circumstances for those scientists who, when faced by the first scanty indication of the cosmogonal hypothesis of Immanuel Velikovsky in « Worlds in Collision », 1950, considered them to be based on unfounded reasons while - although unusual - they are based on a number of factual refer-

ences and observations, and supported by explanations and interpretations, the plausibility of which cannot hastily be excluded. But one thing is certain, and that is that the persecution which was systematically carried out was both scurrilous and unworthy, based as it was on arguments against sentences taken from their contexts or misrepresentations of Velikovsky's text without even publishing his replies, or taking them into consideration in repeating objections which had already been disproved, and without recognising the agreement of much of the data supplied by exploration in space with his predictions[1].

His theory may even be true; however, its history would already be useful as a memento to all these scurrilous or triumphantly arrogant scientists[2]. One could also mention « Ricordatevi del caso Velikovsky » just as was recommended to the judges in Venice « Recordève del povaro fornareto » in order to avert the death penalty being given to some other defendant who might have been innocent as the poor little baker had been.

5. - Some introductory examples. — Before examining the individual aspects of the problem more specifically, I feel that a digression is necessary: a simple clarification due to the fact that I cannot understand completely questions put in general and abstract terms, like those envisaged in the editorial giving advance notice of this debate on the relationship between science and culture, and similar ones.

It can be taken for granted that I completely agree with considering science as the most advanced and significant part of culture, being the most glorious and typical manifestation of the human intellect - excepting only the admiration for the sublime qualities of art and poetry - and I find ridiculous the petty or Croce-like mentalities who express a contrary opinion. But I can not see how and why the possible acceptance of this point of view - ridiculous or nonsensical as it may be - could or should involve for the scientist a lesser « awareness » and exonerate him from « obligations and responsibilities ». I also agree, as will be made quite clear from the following, with the analysis of particular defects of the present social, economic and educational structures as well as with those structures which guide a great part of present day research. But also here I do not see in this fact a circumstance which in any way determines the question. Every situation alters, restricts or enlarges, in one sense or another, the breadth and nature of the repercussions of every act or decision of an individual or group in whatever field, scientific or not; consequently, awareness of the obligations and the responsibility of every individual or whatever action he takes or decision he makes must extend to the repercussions which can be forecast in relation to the existing situation.

In every case, the responsibility is always individual and inescapable even for collective decisions. There cannot exist abstract absolute standards, which

[1] One of the so-called 'absurdities' for which Velikovsky was most reproached by astronomical experts was his assertion in 1950 that Venus was very hot, whilst according to their calculations it had a temperature of —25°C or more. After the Mariner mission in 1967 and other observations, its temperature was estimated at between 500° and 600°C or more. A long and detailed « Record of Success » can be found in the pamphlet of *Pensée* quoted in the following footnote.

[2] A thorough critical report of the whole affair can be found in « *The Velikovsky Affair* », pub. Alfred de Grazia, 1963 (distr. FOSMOS, 1503 Connecticut Avenue NW Washington DC 20063). More up-to-date information is available in *Pensée* (Student Academic Freedom Forum, P.O. Box 414, Portland, Oregon 97207) Vol. 2, no. 2, May 1972. (completely dedicated to Velikovsky, who was also the subject of successive issues). In Italian there is an article by B. de Finetti, which is principally concerned with the Velikovsky case, entitled « Remore e freni sul cammino della scienza » in *Civiltà delle macchine* » 1961, No. 3; May-June.

prevent an individual from having to question his own conscience for every separate instance, and obey it or silence it for reasons of advantage or cowardice or any other reason. This is how I see the problem; I am not a lawyer and I don't know if the idea is formulated well or if it corresponds to the viewpoints of lawyers. Certainly, specific limits would have to be laid down, but I don't know how this would be done, nor am I interested.

However, the responsibility for possible negative consequences of scientific discoveries should certainly not, as one so often hears said, be heaped on « science » or the scientific spirit which refuses usually to be content with the world as it is!

Every new discovery, at least potentially and to begin with, unforseeably opens up possibilities of technical progress which may have either good or harmful effects on civilisation. The responsibility lies with the person who makes the harmful choice. Would it be sensible to attribute to Prometheus (or the spirit he symbolises) the merit and the blame for all the good and all the evil which humanity has derived from the use of fire?

6. - THE SIMPLEST CASE. — In initiating a more specific examination of the different types of situation which are possible, I want now to consider the simplest case: the case of research carried out expressly to implement a practical application which may well be negative when judged morally: this is certainly the case for the production of new weapons, harmful foods, industrial plant which causes pollution, defective instruments which are dangerous for those who use them or for third parties, and so on. The scientist (and any collaborator or person who applies the results of his research) who willingly accepts working on such a project is responsible and guilty without any possible shadow of doubt.

And yet ... even in such a clear well-defined case there are possible counter-arguments which may be rejected (as I myself reject them as a matter of principle) but which cannot be ignored by refusing them a hearing. The research for new weapons is undoubtedly to be condemned; and this is even more evident now that we have before us the example of Vietnam, where the criminal lunacy of four or five hawkish generals and advisers, who believe that it is less dishonourable to be tainted with genocide rather than admit frankly their own errors and defeat, has prevailed.

Better: let us consider the example of Brandt, who knelt humbly on the site of the massacres at Auschwitz. But if on the other hand one casts one's mind back to the first atomic bomb, to the dilemma facing Fermi and Rasetti, what is to be said in their case? Who was right, who wrong? Being wise after the event, the answer is easy, but at that time the choice was undoubtedly agonising: will the other side make the crucial break-through first?, and what will the fate of the world be then?

In other cases the usual alibi will crop up: « if I don't do it somebody else will accept », and then there is « I must keep myself and the family », and similar reflections. All right, they are not valid and should be rejected, I agree, but - and there is a large but! Then, in many cases, for those who are only concerned with a small detail there is the further excuse of « I am only concerned with a small cog-wheel and I don't even know what it's for ».

Then for the entrepreneur there is another cast-iron alibi: « If I don't do it, my competitors will ».

I don't want to play the rôle of the Devil's Advocate, and it is precisely the devil who teaches us to justify ourselves in this manner, but it seems to me very necessary to note how things become more and more complicated when one takes a close look at them. And everybody stands a good chance of shuffling off and diluting their own responsibility in the ever-increasing and intricate network of collective responsibility with all its many nuances; particularly if this possibility is not contested, and if one is not offered a way of avoiding pressing necessities.

But there is certainly a kind of collective responsibility which is at the bottom of all these problems: namely the eternal distortions in the midst of humanity; the distortions as a result of which war is still an acceptable and conceivable phenomenon which indeed occurs from time to time; distortions as a result of which success in business, or the possibility of having a job with a living wage, often depend on being able to deal in and dispose of bad products, or on polluting the atmosphere, rivers and seas, or on working for someone who is successful in this. Therefore if a scientist seriously poses the problem of his own responsibility he can't help recognising the fact that he can't limit himself to his own sector of research or even the entire scientific field, but must include, in his view of the distortions which need correcting, the entire system of the existing framework of society.

7. - THE UNFORSEEABLE RISKS. — A case apart from the others, in so far as its technical aspects are of over-riding influence, is the case of products, processes or practices whose harmfulness or dangerousness is only revealed after a certain lapse of time, which is often long. The examples which come immediately to mind are those of Thalidomide, DDT, and plastics; I am not sure whether in these and other cases there existed hidden motives for a priori fears and that it was imprudent to have neglected them, or whether it was a matter of completely unpredictable consequences with very belated effects.

More or less well-founded doubts can also exist (an expert was telling me with regard to DDT) concerning the prevalence of advantages or harmful effects. The problem here is to know whether and how the risks of harmful effects can be reduced by means of preventative research and systematic checks, and compare these risks with the possible benefits, establishing in which circumstances it would be advisable to refuse to use the product concerned on account of suspected unknown dangers.

When any possible harmfulness has been ascertained, i.e., the prevalence of harmful effects over advantages, the guilt of those who persist is obvious, in so far as it comes within the above-mentioned hypothesis. The difficult problem - and I cannot imagine how it can be dealt with - is still that of the responsibility for the damage caused during the period when all still seemed to be going well. I am referring to responsibility in the moral sense: the legal responsibility I believe exists in any case.

There is however one point, which seems to me to involve more than any other, the concept and precept of scientific honesty, and it concerns the behaviour of scientists and technologists in their guise of independent technical experts. It is said, and I don't deny that it is true, that the arguments employed by lawyers engaged in illustrating every element in favour respectively of the prosecution and defence help the judge in making an impartial judgement;

and yet I myself am unable to justify and respect any lawyer fighting a case for which he is paid when he believes or even knows that his case is wrong. And it seems to me that this latter fact must carry far more weight for the scientist or technologist because the nature and degree of certainty and objectivity which can be reached in the scientific field is normally considerably more (and certainly more easily definable, even with regard to presumable margins of uncertainty). It is not a question, as in the juridical field, of a mass of conventional standards, often chaotic and impractical, in the interpretation of which in countries like, unfortunately, ours the quibbles of every pettyfogging lawyer are admitted and considered, whereas every reasonable and essential adaptation to the spirit of the times and the evolution of situations and mentalities is contested.

8. - Consequences deriving from social structures. — The most serious aspects of the question - if we wish to define them in their real terms as 'Scientia' has quite rightly wanted us to - are those which concern the repercussions of the introduction of discoveries or inventions on society because of the political, economic and social structures existing in various countries, more than the utility or harmfulness in themselves of these discoveries and inventions made by scientists and technologists.

It is quite understandable that every innovation generates imbalances which must be overcome, with various adjustments and consequent inconveniences. I don't believe that any system has been able to avoid this, but it is very natural that the inconveniences are particularly serious and badly distributed where the so-called free market economy is in force; because in such systems there is a complete lack of correctives of a social nature as a result of which every imbalance has to be borne mainly by the least prosperous and most defenceless groups, above all through unemployment and underemployment.

An obvious example of this - no different, however, from many others - is precisely that which is at the present time paralysing Great Britain on account of the dockers' strike; namely the advantages gained from the introduction of containers as a means of transport, which are at the expense of the latter and to the advantage of the employers. It is clear that an innovation is advantageous, not if those putting it into effect gain from it by damaging others, but only if by effectively distributing the advantages in opportune fashion, all are better off. However, by advantage one must mean the advantage in real terms of well-being and quality of life; improvements in housing, diet and other useful consumer goods; less drudgery, more free time and more social security, and improvement in cultural and civilised living standards.

Traditional economists, on the contrary, normally refer to fictitious advantages based on simplistic calculations in deceptive monetary terms and maintain that in this sense, in the long run, there will be an automatic appropriate redistribution. But - apart from the fact that this is not certain, but only presumable as a consequence of other presumable adjustments - the fact still remains that in the meantime the people damaged are precisely those, as always, who are the least able to wait for the long-term benefits.

Furthermore, in order to be in a position to consider an innovation or any change, not even the economic considerations considered above, as opposed to purely monetary ones, are acceptable. They must be replaced by socio-

economic considerations with the proviso that any redistribution of advantages should be such that it reduces or at least doesn't increase social inequalities and their consequent injustices and abuses. What most often happens is, on the contrary, (both in Italy, if we consider north and south, and the rest of the world, considering the developed and under-developed countries) that even if all improve their standard of living - and if only they could at least do that - the inequality grows.

9. - THE DEVIL'S MILL. — What causes these distortions? The tragic sophism[1] on the basis of which many believe, or at least seek to make others believe, that the system based on the « market economy » in the régime of so-called economic liberty leads to the « best of all possible worlds ».

In my perhaps immodest opinion, the law of the « market economy » - or, better, the law of the « market economy jungle » - is on the contrary a « predatory, evil, cruel, execrable, aberrant, senseless, feckless and stupid tool »[2], in which « liberty » is nothing other than a grotesque joke for the many who are subjected to the tyranny of those whom «liberty» exempts from feeling any scruples or remorse for their actions and their consequences.

I have recently found this same criticism developed in a synthetic but extremely effective and rigorous manner in a magnificent excerpt from Roger Garaudy[3] from which I synthesise and quote a few sentences below.

« *Any society governed by blind laws of free-for-all competition and individual profit escapes all conscious control of its aims .... It is the first society in history which is not founded on a plan for civilisation* ». It is characterized by « *a radically new phenomenon in history: the extension to a higher and higher level of the absolute law of the market, which accepts no other law than its own and subordinates to itself all other social relationships. In this way an unprecedented structure of human relations has been created: everything can be bought and sold. There is nothing that cannot be devoured by this « Devil's Mill », above all labour, land, and money* ».

« *Buying and selling man's labour* » .... and « *making money marketable (that is, granting it a value even without work) is a manifestation of a blind rush towards profit, producing and selling not what corresponds to social needs but what brings the greatest return on private investments* ».

« *By making land an item of commerce we have subjected man's entire living space to speculation, with consequent pollution of the atmosphere and water and a massacre of the countryside and environment* ». This is a subject which I shall discuss later (Numbers 11 and 12), but these reflections on evident facts which are rendered even more vitally evident by Garaudy, already demonstrate how the task of saving an environment, like that of saving and liberating man, is radically in antithesis with the sophisms, the impostures and the knavery on which one founds and with which one perpetuates the fateful and iniquitous « Devil's Mill ».

[1] « Il tragico sofisma » is one of the articles repoduced in: B. de Finetti, *Un matematico e l'economia*, published by Franco Angeli, Milan 1969, where practically all of the articles touch these problems and the ways they should be tackled.

[2] Cf. the second of the articles in the volume about to be published on the proceedings of the CIME course on mathematical economics, Urbino 1971, entitled: *Requisiti per un sistema economico rispondente alle esigenze della collettività*, edited by B. de Finetti, published by Franco Angeli, Milan 1972.

[3] Roger Garaudy, « Un progetto di civiltà a dimensione dell'uomo », in *Note di Cultura*, No. 75, Florence, January 1972.

10. - A DIFFERENT DIRECTION FOR THE ECONOMY. — It is now time to ask ourselves, and probably the reader already wishes to ask me, how it is that professional economists are unaware of these distortions? The fact is, that they themselves are usually prisoners of the conception and ideology on which the system is based; or at least they are prisoners of an opposed conception and ideology, e.g. a marxist ideology, and consequently are in any case conditioned by preconceived ideas. In my opinion, every conditioning of this kind is counter-productive. These opinions which I express as my own may well be judged as mistaken ones, but, if they have one merit it is that of not being influenced either for or against by having to differ or agree on any particular point with one or other of the prevailing ideologies. I have often said that my criticism is from the left with respect to marxism in so far as it is more radical in criticising the established disorder and all that this entails. This is in a certain sense true, but in another sense I could consider myself as a social-democrat supporter of a more radical version - much more radical - of the Scandinavian-type Welfare State.

However, it is my impression that the more or less theoretical - or even mathematical - edifices erected by professional economists are themselves too much tinged by concepts and underlying implications linked to the systems at present in force to be able to be used to tackle problems ex novo with the intention of ironing out the distortions and getting rid of the preconceived ideas which cloud the vision of those who accept and study and theorize about these structures, even if for the past twenty or thirty years they have rarely idolised them, or created myths about them.

It should also be realised that those who don't « accept » these structures as ideal can only make use of the economic set-up as criticised above if they intend to study the existing possibilities « within the system »: just as in a country where it was forbidden to stand up, the possibilities of reaching any goal whatever more rapidly than at the maximum possible speed at which one can crawl on all fours would automatically be excluded. It would however be a mistake to maintain that one could not get there any faster in an absolute sense, expressing dogmatic assertions that to walk upright is impossible because contrary to physical and physiological laws and not simply because a legislator or witch had prohibited it.

In our case the analogy with the above simile can perhaps be indicated in the following way - which perhaps expresses the essence of the contrast between the economic system criticised above and the one I hope might be set up as an economic theory: crawling on one's knees is the destiny of those living under a system which considers humanity as a « firm » whilst walking upright is the destiny of man in a system in which humanity is conceived of as a family. In a firm if there is an innovation or improvement someone is left without work and without food; in a family, all would have the same - or more - food and would work less, or would produce more and all have something more. This example is sufficient to illustrate the previous points; but the conclusion is the same in any case. Everybody should share both the benefits and the disadvantages, without any privileged classes who get relatively better and better off by profiting to a greater degree from the advantages and at the same time avoiding to a greater degree the disadvantages.

It may seem presumptuous on my part to quote the beginnings of attempts made by me to see the economic problem in this light, independent of the normal schemes and the existing type of frames of reference, but perhaps

someone may at least be inspired to do something better following the above-mentioned outlines and intentions which in my opinion constitute what is necessary to get out of the tangle of out-moded relics which clutter up and obstruct our path towards the future. This article with the title of: « Utopia come presupposto necessario per ogni impostazione significativa della scienza economica » (Utopia as a necessary assumption for every meaningful organisation of the science of economics) will appear in the current issue of CIME on mathematical economics, Urbino 1971 (volume already quoted in section 9 above).

11. - CAN MAN SURVIVE? — A different and more dramatic example of the spirit in which it is necessary to tackle the economic and social problems, when one is aware of the impending threats, has been given in the research promoted by the « Club of Rome », formed on the initiative of Aurelio Peccei, and developed by a research team of scholars from the Massachusetts Institute of Technology (Cambridge, Mass) on the length of possible survival of humanity and perhaps even of life on our planet if we persist in blindly allowing - or even only moderately restricting - population growth, the using up of natural resources, the destruction and exhaustion of cultivable land and worsening pollution.

The prognoses are catastrophic; we have scarcely a century left to deal with the problem, and in appalling and rapidly deteriorating conditions. Articles on the question have also appeared in Italy in the weekly reviews; in particular an issue of the Espresso colour supplement No. 28 of the 9th July 1972 dealt with it. One can read a preliminary summary of the research project in the pamphlet « The Limits to Growth », Earth Island, London 1972.

Opinions differ greatly on the reliability of these forecasts. Further research projects which are at present under way and which have been independently set up will be able to throw new light on the question. Nevertheless the illusion of the ignorant (and often, when faced with unexpected situations, even educated people instinctively react in an ignorant manner) is dangerous and without foundation; it is an illusion arising from the observation that « we can't yet see saturation point ». The unsuspecting should be told of the fable of the lake in which there is an amoeba and in which, since every twenty minutes an amoeba becomes two amoebae, every day the amoeba population multiples itself by one thousand milliard milliards (10^{21}). But the lake is large, and it will take a million years before it is jammed tight with amoebae and we needn't worry. Fine ... but - and this is the fact we should be reflecting on - until a few hours before the catastrophe the presence of amoebae was imperceptible: everybody would be able to cross the lake in peace and sleep peacefully by the side of the lake for a million years, until one day on waking up they would find that a danger they had never perceived had unexpectedly and catastrophically exploded without warning[1]. In the same way not even in our case would the visible warning be in time.

12. - CONCLUSION. — However, even if we play down the dismal forecasts, it seems that it will be very difficult for us to ignore the logic of the conclusions: that is, we cannot avoid the necessity of setting up, and setting

[1] This version of the well-known fable is taken from D. B. Suits « Applied Econometric Forecasting and Policy Analysis » in *Forecasting on a Scientific Basis*, Inst. Gulbenkian de Ciência, Lisbon 1967.

up soon, even if not immediately, as the calculations resulting from the MIT research would indicate, a strictly drawn up programme based on the prerequisites of satisfying the essential social needs of humanity on an egalitarian world-wide basis. Naturally such ideas meet with fierce opposition in many circles, but it is symptomatic and indeed indicative that they have found a convinced supporter in Sicco Mansholt, the authoritative economic counsellor of the European Economic Community.

Taking the preoccupations of « The Club of Rome » and developing them with extremely closely argued and practical reasoning and premises, the MIT researchers have reached the same conclusions about the economic problem - and indeed the problem of any future economy, if this economy can have a future - as that which was reached quite independently by the mathematical hypothesis indicated above in Section 10. This is one more reason for believing that it is a correct approach: the approach, in which the scientists who tackle the problems which have been raised in this article - thanks to the initiative taken by « Scientia » - will find guidelines to go more deeply into these problems, an approach which the world and humanity needed to find.

B. DE FINETTI

Translation: P. Clàre - Rome

MAN-INSTITUTIONS RELATIONSHIP WITH SPECIAL REFERENCE TO THE PROBLEM OF EDUCATION

A NOTE

By Giovanni Gozzer
Director
Centro Europeo della Cultura, Ro

1. There is no doubt that the educational institutions are currently passing through a critical period. The crisis affects both the quantitative phenomena, arising from the growing social demand for instruction, and the qualitative phenomena, referring to the "school" institution's specific comportment in its normative and programmatical functioning. The crisis besetting the educational institutions is closely allied, even though in ways not always evident, to the crisis of all "total" institutions, in other words those institutions governed by the logic of a differentiated relationship. The institution, then, should be accepted and respected, not attacked simply because it is an institution. To the contrary, the individual who utilises it must adapt himself to its demands, and limit his critical interventions at the utmost to constructive aspects and suggestions which, in one way or another, can improve that institution's formal efficiency and thus contribute toward reinforcing it. It is easy to cite other sectors, such as the penal, corrective, psychiatric and the many welfare institutions; but even here we find primarily a logic of dependency bound to situations of non-parity and therefore of the subject's non-freedom, although such conditions take different forms when a schoolboy, a prisoner or a mental patient is concerned.

In any case, today the debate on the crisis of the educational institution is wide open. These brief notes treat only its qualitative aspect.

2. Various responses have been put forth in an effort to resolve the qualitative crisis, corresponding to as many operative attitudes and their consequent strategies. These responses, we believe, can be substantially reduced to four.

The first is merely to "reinforce" the institution. In this interpretation, the crisis is attributable to the failure of authority. It maintains that the problem of the scholastic institution could be resolved by reverting to strict discipline, rigorous selection and "law and order", and thus restoring in full measure the time-honoured methods followed by the educational system.

The second response maintains exactly the opposite, but identifies with the first in many respects, since it mirrors its negative speculative image. This response proposes "confrontation", and it is advanced by those who see a priori in the institution's functioning a deliberate intention to pursue repressive ends. They fail to see the institution as a "historical" consequence undermined by an inertia which must be overcome by corrective measures, not by sterilising negations.

The third response involves what could be called "reforms", It assumes that the institution is capable of responding to new situations and needs by external adaptations -- democratisation, participation, innovation -- which do not, however, alter its intrinsic nature.

The last response calls for "de-scholarisation", a recommendation which has attracted considerable attention in the very recent past. This attitude maintains that the institution should be regarded as insignificant and non-utilisable, and that it should be allowed to lapse into obscurity and drift abandoned, like a derelict shipwreck.

3. None of these hypotheses seems acceptable today, at least not in the prospective suggested below, since the man-institution-society relationship is essentially one of survival.

The real problem lies in adapting this relationship as much as possible so that it will conform to man's situation and needs.

4. With this objective in mind, we must single out:

a) the institution's new roles, and

b) the new procedures by which these roles can be realised.

Where the educational institutions are concerned, it appears evident that a profound modification of objectives, hence of roles, does in fact exist. Destined in time either to provide the socalled basic elements (primary school) or to prepare the elites specialised in administrative and executive functions (secondary school and university), the educational system today is becoming an instrument of social functionalism and permeability vis-à-vis a society with characteristics no longer rigidly structured by differentiated groups and which responds to the needs of an economic, productive reality which is overthrowing traditional sectorial classifications.

To these demands, therefore, must be given new answers, which still remain to be formulated.

MUSEUMS AND FUTURES STUDIES

An Alternative For the General Publics' Participation in Futures Studies

by T. Lance Holthusen
Director, Future Studies
Science Museum of Minnesota

The world is one. The past, our fleeting present and the future - all part of the same continuum. The basic assumption of this paper is that the whole world belongs to all men to care for and to determine its future. One of the primary mandates of religions and governments is to care for people and their environment for living. How governments, corporate structures, institutions and individuals both interpret and carry out that mandate is quite another matter.

It is also an assumption of this paper that governmental structures, corporate structures and the many other forms of social institutions are human institutions. They are not above or extra human, but have the same mandates as individual humans. They, therefore, have the same responsibility and gift for caring, interaction and creativity. Man and his social institutions will purposefully or inadvertently create the future.

The thesis of this paper is that futures studies belongs not only to an elitist few, but is also the responsibility of general publics. Further, general publics need to have access to the tools (technologies) for imaging, modeling, assessing and choosing alternative futures. It is still true that futures studies need a high standard of quality. It is, however, just as difficult to distinguish between elitism and concern for quality as it is to distinguish between general publics and non-quality. For our purpose, however, let us not be as bothered with this distinction as with what is happening in futures studies.

Futures studies has a good start in evoking a creative balance with many of our efforts. We must be careful, however, that we do not let futures studies fall into the same trap that many of our institutions have, that of blind self-perpetuation for its own sake, lack of trust and irrelevancy. We have limited ownership of the future largely to an elite. - The academic, the industrialist and private researcher and the governmental specialist. For various reasons the futurist is still in danger of being guilty of the same faults we attribute to big business - lack of trust, arrogance and sheer profit motivation. Therefore, we need to extend our trust and genuine

---

NOTE: This draft will become part of a publication to appear in 1974.

interaction both in working within structures as well as between structures.

What this means in effect is that all people participate in the process of change and determination of the worlds future. Publics need to experience and understand through new and innovative ways how they are in fact making the future by their present actions. They need to know they have a choice. This is, of course, absurd to many, but our goal should be that all have at least access to understanding and participation.

A good starting point is that the various institutions of society see themselves as human entities. Corporations, for example, come into existence to allow one or more persons and their resources to function as an individual, but also to protect the one or more persons who own the corporation from its actions. This allows the corporation, of course, to be a-human. Governments, the church, the school and even now the family are responding in much the same way in insulating themselves from human responsiblity. The elite, the few who know, invent, decide and implement, can not afford society that heresy.

Institutions pursuing futures studies therefore have two objectives in addition to those usually stated. First to be highly interactive with other institutions. This means trust and willingness to share. It means openness. It also means public ownership of the state of the art. Those engaged in futures research are really public servants. However essential it is to maintain our extremely high level of quality the ultimate test is public understanding and acceptance. The public must be enstrusted with participation in not only assessment of new knowledge and new technologies; it must also be allowed to participate in its creation and shaping. Trust involves a risk not too often extended by those in control of knowledge and information systems. It is not lack of knowledge and information that prevents us from discovering and implementing solutions to our problems. It is our fear of change, our fear of the public - our lack of trust. The easy problem is always the technological question. The difficult problem is the human one. Therefore, the second objective for futures studies is to provide every opportunity possible for general publics to become futurists in their own way. It is not so much the publics inability

to deal with change or their lack of concern, as much as it is their inaccessibility to meaningful participation in their future.

We need continous dialogue among the experts. They are in a position to know certain facts and possible impacts with very accurate prediction. We need, however, the dialogue to be extended. Not just in an interdiscplinary fashion, important as that is, but with the public. The expert needs the public and vice versa. The real genius of invention is still most often found with 'the people.'

There are many institutions which can begin to provide the arena for this partnership in tomorrow. One of them is the museum. Many museums such as those dealing with history, natural history, art and various specialties could be equally appropriate for understanding the future as well as creative conceptualization of the future. We should, however, here suggest the public science museum.

A museum is a public trust. "It is an institution which performs all or most of the following functions: collecting, preserving, exhibiting and interpreting the natural and cultural objects of our environment... Its mission is two fold: the advancement and diffusion of knowledge, and the enhancement of that awareness which affords pleasure and delight... people come to museums to be delighted, not to be taught or preached at, or improved... except by works of art themselves... A museum is - or ought to be - a place where one goes to be refreshed... in short delight as well as education... to make possible the enjoyment of learning (by) dealing with original evidence." - American Association of Museums, The Belmont Report, 1972.

This is the current popularly accepted notion of the purpose of museums in the United States. It is reported one child who recently visited a museum said, "I liked it best because the things I saw were fun, even though I learned things.", quite an exciting comment regarding the above definition in the broadest sense. When one looks at many of our sterile glass cases with their encyclopedic carding and few opportunities for publics to really use the resources and staff, one wonders about that "public trust" claim.

In early history the interest was much more futures oriented, although it really couldn't claim accessibility by the masses. In Greek, museum or μουσειν referred to the realm of the muses. It was a place where man could go beyond the affairs of everyday life and

think about the heavens, yesterday and tomorrow. It was a place for reflection and inspiration. It played not a small part in the shaping early civilizations. The place of the muses was public, however, only the classical narrowest sense of the word, restricted only to the learned. Similarities? In that sense I hope we have come far.

Real public access to the museums has evolved with the temple, the encyclopedic collections of knowledge, to collections of local and world treasures. The museum as we know it today has been public for less than 200 years.

Today the museum is fulfilling a function more and more abandoned by other primary social institutions. The family, the church, the school and governments have to a large degree limited their vision to the present. They have become "now"institutions concerned only about being "with it", modern, - in a sense, therefore, ceasing to grow. It is at that point that one's heritage of the past does become meaningless. Whether that is good or bad is not the point. The point is there is a lacking the concerted effort to preserve and research the traditions of the past to understand it in terms of its impact on the future. Rene' Dubos has suggested that in this sence, perhaps the museum will be the church of the future, the function of the church being that of preserving, understanding and celebrating the traditions of man his culture and his gods. Hopefully it will not be a destroyer as the church has at times. (This is not to assume Dubos is suggesting the museum would or should take over the role of the church.) The point of all this is that the museum, because of its focus on understanding the past in terms of its impact on the future, is an institution critical as a medium through which we become human. What is it to be human? How do people understand what it means to be human? In part by looking at the past. By looking inward. By looking at man's technologies. By shaping man's future.

The science museum is in a unique position to play a role in mediating the future.

- it is public
- it has the reputation of openness and neutrality
- its consumers need not be involved for an academic degree
- it can work effectively with other institutions, especially in coordinating resources, i.e., business and industry, government, community, cultural, as well as individuals in special interest groups.

-its primary resource is life.
-its tremendous storehouse of objects and ability to exhibit in a stimulating multi-sensory way.
-individualized learning opportunities.
-research emphasis.
-freedom.

Since futures studies has recently become a separate discipline (and that is still debatable) there are few departments in any institution entitled Futures Studies, Futures Reserach, Futurology, Futures or what ever. We have attempted however, to discover what is being done in the museum world in futures studies. In reading the world museum directories, not one museum has in its department headings or professional or employee skills listings futures studies.* Dr. Arne Sorenson of The Society for the Study of the Future in Denmark is doing pioneering work in that country in the development of a Futureum, however, it is my understanding that is still in its developmental stages.

Going a step further we have begun a delphi study of museums regarding museums and future studies to determine -

1. What is the state of the art within museums?
2. What could it be like as a museums program?
3. Should Futures Studies be a part of museology?
4. How is it apt to come about?

The first phase of the study has simply been to probe primarily traditional museum personnel - directors and department directors, to gain a preliminary sence of how knowledgeable the professional is regarding futures studies. 261 persons were selected from museums in art, natural history, science and special interest museums such as medicine and historical societies. Thus far 56 or 21.4% have responded. The first phase was not intended to be instructive in any way. Futures studies was not defined nor was the intent of the study. That will be done in the follow up delphi.

The following is some of the information gathered:

1. Do you have any "futurists" on your staff? If so, would you describe the extent of their activities in futures studies.

No - 49
If I understand you - 3
Yes - 2
Yes, I am one - 5

* The one exception is the author who is director of a newly formed department of Futures Studies at the Science Museum of Minnesota.

2. Question two is an attempt to determine generally how widely read in futures studies literature participants are. The Hot List Delphi by Michael Marien was used. In it he lists 34 books out of 268 which were considered by a panel of futurists to be basic intorductory readings. The following is a summary:

a. 3 persons read none of the mentioned works and offere no suggestions save one, the Bible.
b. 1 person read only one work.
c. 9 persons read 2 works.
d. 4 persons read 3 works.
e. 8 persons read 4 works.
f. 5 persons read 5 works.
g. 2 persons read 6 works.
h. 5 persons read 7 works
i. 1 person read 9 works, 12 works and 13 works.

The following is a breakdown of what was read:

1 - Ayres, Robert U. Technological Forecasting and Long-range Planning
0 - Baier, Kurt and Nicholas Rescher Values and The Future
3 - Bell, Daniel Toward the Year 2000
3 - Boulding, Kenneth E. The Meaning of the 20th Century
0 - Brzezinski, Zbigniew Between Two Ages
2 - Clarke, Arthur C. Profiles of the Future
0 - Dror, Yehezkel Ventures in Policy Sciences
0 - de Jouvenel, Bertrand The Art of Conjecture
2 - Drucker, Peter F. The Age of Discontinuity
1 - Duncan, Otis Dudley Social Forecasting - The State of the Art
2 - Ellul, Jacques The Technological Society
2 - Fabun, Don The Dynamics of Change
4 - Forrester, Jay The Counterintuitive Behavior of Social Systems
0 - Forrester, Jay World Dynamics
2 - The Futurist, Articles on Technology Assessment December 1971 and February 1972
1 - Gabor, Dennis Inventing the Future
2 - Heilbroner, Robert L. The Future as History
0 - Helmer, Olaf Social Technology
35 - Huxley, Aldous Brave New World
2 - Jantsch, Erich Technological Forecasting in Perspectiv
2 - Jungk, Robert and Johan Galtung Mankind in 2000
6 - Kahn, Herman and Anthony Wiener The Year 2000
3 - Kuhn, Thomas S. The Structure of Scientific Revolution
0 - Marien, Michael Alternative Futures for the Future
0 - McHale, John The Future of the Future
22 - McLuhan, Marshall and Quentin Fiore The Medium is the Message
15 - Mead, Margaret Culture and Commitment

8 - Meadows, Donella et. al. The Limits to Growth
29 - Orwell, George 1984
3 - Platt, John "What We Must Do"
10 - Skinner, B. F. Walden Two
7 - Taylor, Gordon Rattrey The Biological Time Bomb
1 - Theobald, Robert The Economics of Abundance
22 - Toffler, Alving Future Shock

(It is this writers suspicion that Mead and McLuhan are the only books having a large count which were pursued as professional reading and that Toffler and Skinner were read as a popular notion. Orwell and Huxley were probably read as assigned academic readings.) The value of this reading survey is that it shows that very few museum professionals are familiar with futures literature.

3. Does your museum have a Futures Studies effort in:

13 - exhibiting
6 - seminars, classes, workshops
5 - lecture series
1 - creative workshops in problem solving
7 - experimental work with media
0 - futures studies resource center
8 - films program
1 - others

Note however, that only two of the participants indicated having futurists on their staff. The writer is somewhat familiar with the source of each of the responses. The exhibiting by and large does not deal with futures alternative life styles or alternative life support systems. However, a few involve some measurement of ecological impact of present technology. This question as with most revealed general unfamiliarity with the term "futurist" or "futures studies".

4. In your opinion should museums be concerned with and involved in Futures Studies?

31 - Yes
7 - No
1 - Indirectly
17 - N. A.

5. Should museums be involved in addition to their past role, with imaging and exhibition alternative futures?

31 - Yes
1 - Somewhat
4 - No
20 - N. A.

6. Should the museum in anyway be involved in shaping future social policy?

28 - Yes
6 - No
6 - Indirectly
15 - N. A.

The comments were surprisingly a very energetic "yes", their additional comments indicated that a museum is in a position for research and objectivity not enjoyed by many other institutions. But most of the answers insisted that the museum be involved only if it could guarantee a high degree of trust, objectivity and openness. The danger suggested is that museums could be "bought out" like any other oganisation.

7. What role do you think museums should play in the bi-centennial? Should it focus on the past, or, the past and the future?

28 - Yes
3 - Somewhat
7 - No
2 - N. A.

Again, the affirmative was very energetic. The emphasis was that the focus should be on the continuum, the process of the past and the future are one. Most responses also suggested that the past be delt with in terms of its impacts on the present and the future.

The following phrases are typical exerpts received so far regarding the role of futures studies and museums:

-to preserve the past for educational use - not futures archives of information based on real objects.
-greater role in community education.
-fear of decay toward Disneyland.
-museums will remain the same at local level, larger museums will emp more electronic devices and modernize.
-this will mean a popularizing "stoop" to the common man.
-fear of governmental interference and misuse of government moneys.
-science center is not a museum.
-should be available to all citizens.
-inspiration, stimulation are primary goals.
-technology that would make available all the knowledge of the world its information, objects, ideas, experiences - to all people (computers, television)
-a short view of natural world.
-no real change forseen

-research in a primary function and should be, interpretation of the results of that research may even be secondary. Research, therefore, exposition and interpretation.
-shrine to the past is our most important goal.
-museums must combine subject matter, not be compartmentalized, must be integrated.
-we need more inter-institutional linkages.
-social design - indirectly.
-should be involved with bi-centenial.
-fact and fancy should not be mixed.
-futures studies is just one more "educational" flim flam rip off.
-excellent opportunity for "special education".
-"I'm a 61 year old museum professional and I think Futures Studies is really getting it all together as far as the purpose of museums."
-research activities as well as educational activities are essential.
-more general publics should be involved. Accessibility by all.
-must be more than depositories.
-role in futures: reflective of past; interpretation of current phenomenon, alternative for futures.
-learning center.
-need for cross institutional programming.
-greater specialization of museums - a smorgasboard to choose from.
-more satellite programs to extend the resources.
-museums should become part of a citizens every day life.
-how can one deal with what has not happened, the future?
-hopefully schools will begin to use museums more.
-past, present and future is a continuum, one process.
-greater involvement of resources of business indirectly and government.
-more of a "town-hall" experience involving the past and the future in the now. An open forum.
-greater educational role, greater role in social change.
-specialized museums will deminish.
-past important only as it bears on the future.
-link between past and future.
-more than galleries - always pointing toward futures.
-become less a community attic and more an educational institution.
-role of museums will increase with early retirements, leisure, and the increasing role of education as a part of life.

The following are preliminary conclusions from the first portion of the study. They will be used together with other information to further develop the delphi.

Overall conclusions:

1. There is a lack of understanding and acceptance of the importance of futures studies.

2. There is lack of understanding of publics role in technology and new knowledge assessment.

3. There is generally an enthusiam to learn more about futures studies.

4. Research aspect of museums is of utmost importance.

5. Money is the greatest problem for museums; staff, people ideas, objects- collections, community a greatest asset

6. Museum is one of few places that can have a reputation of objectivity on societal issues.

7. The future needs to be delt with heavily, but not at the expense of loosing the heritage of the past. "Since the past is easier to deal with, we will go on doing that and let someone else rick their reputation on dealing with the future.

8. Worst possible museum is one available to only a few or where ones imagination is not stimulated. It is also one with a slanted or "bought out" point of view.

9. The role of the museum as a supportive resource for curriculum development at all levels of education is critical.

Let us turn to the scenario. There are many kinds of museums, general and comprehensive and very specific. Many could appropriately include futures studies as part of their program or be soley futures oriented. Others could not. The following scenario uses as a point of departure a rapidly growing science museum with strong paleontology and anthropology departments and a relatively new biological and physical sciences department. Last year it began developing a futures studies department. This scenario will be short range projecting to about 1987. A second scenario in this publication will deal with a middle to long range alternative.

In ten short years the museum has changed radically. It now sees that it will continue to change and is accepting the change as non-threatening. In fact the staff and Board in general have never been so optomistic about the state and role of the museum in society. They see the museum as an integral part of society as an institution for learning and development of social policy as well as leisure.

Actually the change had been coming for many years. The most important person in the change was the director whose strength is his confidence and trust in people. His effort both with his board and his staff is to help build people and give them the freedom to work. It is not surprising that the publics who use this museum as part of their life sense the same feeling toward themselves.

If the museum visitor is a student, when he walks into the museum he is greeted by name. At his core learning center he has already previewed the museum through the interactive cable T. V. and computer terminal and indicated he is coming. (It won't be too many years before he or any members of his family will be able to do same from home.) One particular student has two agendas. First he has decided to continue work on a "game" he has designed for himself, a notion he had five years ago in first grade. He decided then he wanted to build a space camper. His school, of course, didn't have any time for such "crack pot" childish notions. At the museum he discovered the futureum and ecosphere where he could draw on many of the technologies of business and industry and all of the other departments in the museum that he might feel appropriate. Thus far, he has discovered that he might be lonesome "out there" and he doesn't know what to do about that because his friend next door can't go along. He was told that the human question would probably be his most difficult, but he'll think of something. Since this is his hobby it soon came time for him to work on something "less frivolous", although he wasn't sure he thought so.

The second part of his agenda at the museum was to work on an assignment from his learning center with eight fellow classmates. Since they and their parents had been so critical of the school system, the students and their parents were given an assignment for the year, designing alternative forms of education. They had decided to do it with at least one of their parents which made at least 16 in the group. The museum offered a good setting for a part of their project because of their agreed thesis: Education should be an ongoing part of life, not something that is compartmentalized and then stops at age 21. Therefore, they decided to study many life styles of the past and to simulate alternative life styles of the future in order to determine how total education would be a part. The education department which works with

both individuals and groups in special interest pursuits helped design their agenda. For this first part of their project they were working with the anthropology department. For now their interest is looking at alternatives of the past which they might incorporate into their models They made use of both the archives and exhibits of this museum as well as in Chicago and Milwaukee through the new interactive cable T. V. counsels. They were told that the museums goal is linkage with every museum, library and other learning resource center in the world.

Next month they would start gaming with new devices on loan from Honeywell, Control Data, Sperry Univac and IBM to assess models of various learning packages designed but not yet marketed. They were also assessing new information/communication systems. They had learned a version of the MIT world model formula adapted to three levels, their immediate region, the country and then the world. Their discussion for this day ended with the question, "How are we going to measure and assess impact and effectiveness of any models we suggest?" It was suggested by the future studies director that they arrange ~~for~~ several afternoons with the visiting futurist in residence who happens to be on education specialist, who could help design a plan.

A second group of people came to the museum that day. These happened to be senior citizens who were interested in participating in public assessment of a new device designed by a biomedical engineering firm that would prolong life, which was on exhibit. Many were not so sure they wanted to live much longer if it meant being less than human and they wanted to see how this new device was human. They found that they could see the device in may ways, its historic origin, how and why it was developed, the various problems it was designed to solve, how it operated, what actually happened to the body with its use, what it costs were, both immediately as well as long range. They saw how their life style might change. All had an opportunity to register their own assessments of the device. For this assessment process they used either one of the computer terminals, hand written statements or ~~by~~ spoken responses.

A third activity other visitors participated in that day was part of an ongoing design and public technological assessment of alternative future energy systems. This is a five year project funded by federal foundation monies, the regional power utility and a private foundation.

The university, the museum and the regional power company are the cooperating institutions. The museum is involved as the exhibition and public assessment center. At this particular time there are four models of energy systems in simulated communities: a solar energy model, two types of nuclear systems and a fossil fuel system. Each is a working model using actual or simulated components. The models are each part of three communities: the local, the regional and the global. (It was suggested that a fourth, the cosmic community be added.) Within each community the visitor can experience and assess each system for such factors as desireability, feasibility, probability and how to make it come about. He can measure the various ecological impacts, financial costs at the given daily dollar value, resource availability and depletion, effect on human health, effect on other living things, aesthetics, etc. The visitor is invited to create and alter variables. He is invited to indicate his needs and his desires. He is invited to indicate ultimitely which he feels is the most desirable energy system. Thus far 2.5 million people have participated in the assessment which is into its third year. Twenty five thousand have participated in the project on an ongoing basis since it first year, primarily through the cooperation of the consumer affairs department of the public utility. The university has the programming responsibility with the museums cooperation for this project/as well as other research responsibilities.

What about the stated purpose and structure of the museum. The science museum is a public, non profit educational institution whose basic purpose is to stimulate members of the community towards understanding and response to the questions - What is man? - Where did man come from? - Where is man now? - Where is man going?. Its policies are established by a board of directors elected by the museum membership which is open to the general public. The board responds to the needs and expressed desires of the public and the museum staff.

The departments still have their traditional names although a revision of discipline descriptions is being worked on to more adequately describe what really happens at the museum. The department names at

this point are Paleontology, Anthropology, Biological Sciences, Physical and Environmental Sciences, Education, Communications and Futures Studies The smallest department is actually the latter save for its library resource center center having only four staff persons, director, research specialist, librarian-research coordinator and secretary. Its small size is primarily because it depends on three resorces - the other museum departments - itinerant specialists and futurist in residence - the community, i.e., business and industry, academia, governmental agencies, and special interest groups.

There are three components of the Futures Studies Department:

1. Futures Studies Resource Center including printed material audio visual materials, itinerant exhibits, computer terminals and cable and T.V. linkages. It functions quite like a brokerage firm, tayloring resource packages to individual interests and needs. It serves all sectors of society, being the most complete Futures library in the region. It is also a key regional futures research center. Most of its research forms the basis for the departments exhibition programs.
2. Exhibitions including modeling of real or simulated alternative futures in areas of life and life support systems such as family life styles, health care systems, new technologies, food systems, energy systems, communication, transportation, peace systems, etc. Most of the exhibitions are developed with other departments of the museum as well as expertise from the community. All are interactive and invite assessment on various levels. Business and industry and government have welcomed this compliment to their technological assessment whereby general publics can participate in analizing the impacts of technologies innovations before they are imposed on the market. One of the projects in progress is with a group of senior high school students from an inner city school led by two graduate students from the university. The question is the increase in size and speed in growth of the polar ice caps. What does it mean for future life

styles? What alternatives can be imagined for future problems? This activity is also being carried on in the futureum.

In addition to general exhibiting in the Futureum which is a large workshop area where the various publics can participate in "building" alternatives. Man of the projects are done as "leisure" activities. Several projects have been used as part of the exhibiting program and one has already had considerable amount of interest by one of the regional aero dynamics engineering firms - the space camper project by our eleven year old "crack pot". The futureum is one attempt to build a reward system which stimulates engenuity, not conformity. New ideas are rare and delicate, we need to coax them, preserve them and test them.

The Ecosphere while a part of the total museum program is heavily used for futures studies. The Ecosphere is a large planetarium type facility with a 70 foot dome having a full 180° screen. In addition it has a stage for various types of drama, capabilities of air pressure and humidity and temperature control, smell simulations and several types of sound and film projections. It can be programmed for anything from studying the heavens, to simulating various climatic and social environments. This facility has been of emense intrigue for all segments of the community primarily because it is usually programmed for participant involvement.

3. Seminars, workshops and classes which are designed with and for general publics, special interest publics, school curricula suppliments, individualized educational pursuit programs. Many of the courses offered involve multiple age levels such as third graders and their parents or senior citizens and high school students. Society has finally accepted education as a way of living not a short term preparation for it. This of course needs to be developed much more and our institutions all need to change more to meet that demand, even if noticeable advances have been made.

Most of the public educational pursuit programs are developed with the museum education department. Specialize seminars and other research efforts are still developed within the department.

All of the departments certainly have their own expertise, but a basic change has occurred. The research and exhibitions are much more on a continuum, very heavily integrated one with the other. The central question is no longer "what is it?", but rather "what does all this mean for man and his future?". There is no longer a rigid separation of exhibition halls.

A second major shift is the development of a common bond between science and the humanities, since the museum now has almost as many staff with training in the humanities as the sciences. This new development seems to attract the traditional scientist. There is a strong partnership that has developed between the pursuits of the museum staff and the practicing humanists of the community, largely due to support and encouragement from the state humanities commission. Some of the most stimulating and fruitfull discussions take place when our general publics can participate in dialogues with a noted scientist and humanist.

A third and most exciting change that is becoming more and more evident is the breaking down of walls between business and industries and academia. There is evidence of much more trust and sharing of ideas for common pursuits of problem solving and product building. General publics are involved in assessment of new information, new knowledge and new technologies so that people are experiencing change in a different way. They are helping to make it happen and have a much higher degree of understanding and acceptance. We hope this trend continues and spreads.

Perhaps the most innovative and largest department in the museum is the education department. The museum has gained the reputation for many in the community as being a way of life. We hope this trend continues to grow. Schools are discovering the museum as an essential support system for their curricula design, particularly in their individualized learning programs. Through the education department Futures Studies has been made available to all levels of education - primary, elementary, secondary and continuing. The most exciting aspect of the museum to students is its openness, the wealth of objects and their freedom to use them. The education department is also largely responsible for the some twenty satillites throughout the region. In each of the satellites

there are educational services and itinerant exhibitions. Each also has a large counsel communication center with wall size T.V. screen and computer terminal. The linkage is still just in the midwest, however, we expect soon it will be world wide. Some of the services are free, others, are for a slight subscription cost, depending on the state of funding.

Its quite clear that all other departments exist for the support of Education. Even the research which our curators still say should be carried on for sake of itself, is ultimately for the museums educational trust.

Indirectly a service that the museum is performing is that of shaping and implementing social policy. This has not yet become a stated purpose, but it in fact happens.

It is at this time that several points in summary should be made. First it is not the purpose of the museum to take a point of view, i.e., what the future will be or ought to be, rather to continually research and present alternative futures. It is true that through its scholarship and public assessment certain points of view will be presented. They are presented however, as part of the ongoing process. Second, the treatment of the fourth question of the the museums stated goals "Where is man going?" is not a new idea even though it has not been practiced in museums. As we have seen before it is basic to the intent of museums. It is true, objects are of value in and of themselves; they are of value to man because they participate in his growth. Finally if there is a point of view of this museum it is that we need to take initiative in shaping and preparing for our future and in our own small way have committed our resources to that end. That means knowing and understanding where we have been and where we are now. It means understanding where we will go if we continue on paths charted by present policies as well as understanding what alternatives are available or can be manufactured. It means understanding the impacts of various alternatives and charting ways of advising those chosen as most desireable. People can not be left standing amidst change, but need to be allowed to participate in it. We need to help people grow within one experience to another and then beyond to another. Therefore, let us begin to dream dreams not yet dreamed and continue.

This paper is part of an attempt to discuss the role of museums in futures studies as a way in which general publics can be a meaningful part of shaping the future. It has not been my purpose to say the exper should in any way lessen his pursuit or sacrifice the quality of his research. Hopefully it is one way in which the expert can be assisted in his pursuit. It will no doubt increase his responsibility, at the same time providing more opportunity for throughness.

Thank you for your attention. Your comments and suggestions on how this effort can be improved are welcomed.

THE SCIENCE MUSEUM OF MINNESOTA
Futures Studies Program

A basic purpose of the Science Museum of Minnesota has been to stimulate members of the community toward an understanding of some of science's responses to the questions, What is man? Where did man come from? Where is man at? Where is man going? Through collections, research, exhibits, and educational programs in anthropology, biology, paleontology, and environmental and physical sciences, we have succeeded in the first two and are making progress on the third . . . Where is man at?

We feel that it is also appropriate and exciting to explore the resources of our State, academic, governmental, natural and industrial, for a new program of the future. It is a logical expansion of our program efforts to be a new kind of forum on the subject "Where is Man Going?" that would cooperate with academic governmental agencies, industry and community groups. It would be exciting for the Museum to present exhibits and develop seminar and workshop programs on the future, providing a forum for exchange between the public and those agencies responsible for planning and development. A very important aspect of this program is that academic, industrial and governmental units, as well as other public agencies would be involved in planning the nature of informational feedback from the public that they would want or need, and that the discussions would involve humanists as well as people from science, technology and public affairs.

For many years, museums have traditionally been concerned with the past and the preservation of our cultural heritage. We would like to make use of the past, not only to understand the present but also to deal with the dynamics of change and the future. This means, for example, that showcase displays, dioramas of life styles, models of biological life, portrayals through drama, and other existing exhibits and programs will not stand alone but will support this much broader educational program. Our Museum has also long been interested and active in environmental education, especially in the view that our environment is our total sphere of resources, economic, institutional, industrial, as well as natural, and any study of the future must take all of these into consideration.

Last year the Museum engaged a staff person, T. Lance Holthusen, to help in developing a concept and design for the Futures Studies Department. Several planning task forces within the community have been working with him. One major conference on "Alternative Communication Systems, Minnesota and the Future" was held. Because of their efforts and increasing interest in the community, and from business and industry and academics, we have employed Mr. Holthusen on a full time basis as Director of Futures Studies Program.

What Is Our Futures Studies Program

Futures Studies is a "new discipline concerned with sharpening data and improving the processes on the basis of which policy decisions are made in various fields of human endeavor such as business, government, or education. The purpose of the discipline is to help policy makers

choose wisely in terms of their purposes and values - among alternatives . . . it is intended to sensitize the policy maker (and general publics) to possible alternative futures . . ." and to look at desirable, feasible, possible alternative models. The futurist endeavors to foresee the unexpected and to study their possibilities for improving the human condition. In examining and answering alternative futures our Futures Studies effort will generally involve the following:

1. Futures Studies Resource Center: papers, books, films, journals, audio and video tapes, and "models" dealing with alternative futures. They are being collected from a multiplicity of sources and will be available, not only for our research, but also for the general public, schools, and businesses.

2. Exhibitions: imaging, modeling, and implementation of exhibits of possible alternative futures in areas of life and life-support systems, such as family life styles, health care systems and health care technology, energy, transportation, foods, etc. Again, the primary expertise and resource is from the community, business, professions, and government.

3. Seminars, Workshops, and Classes: these are educational experiences designed:

    a. to supplement school curricula
    b. for general adult publics
    c. for special interest adult publics

To help understand futures and to deal with the dynamics of change, the Futures Studies Department will make use of the museum's traditional competencies concerning the past in addition to new ones dealing with the future

What have we accomplished to date

1. Task forces of community specialists working on exhibitions in two areas

    a. alternative future communication systems.
    b. alternative future health care systems, (focusing primarily on bio-medical technology and engineering).

2. Three day seminar, May, 1973, entitled, "Alternative Communication Systems, Minnesota and The Future" dealing with

    a. The Evolution of Communications Systems
    b. The Universe of Communications
    c. Future Technologies and Communication Systems
    d. Communications: The Human Agenda; (How do we get what we desire?)

3. One day seminar planned for October 5, 1973, as part of the Midwest Museum Conference entitled, "Futures Studies and Museums."

4. Seminar series for 1974, entitled, "Life Systems, Life Support Systems and The Future." There will be eleven in the series which will also be recorded and edited for film and television.

5. Futurists-in-Residence: We are very pleased that Earl C. Joseph, Staff Scientist and Futurist with Sperry Univac Corporation is assigned to work with the Museum six days per month to help with research and exhibit design.

Work is continuing to progress in developing our exhibits program and resource center. In conclusion let it should be said that our purpose is not to say what the future will be or what it should be like. Our focus is on researching and presenting the various alternatives. What is feasible, possible and desireable will be determined by the public. We want to be a new kind of forum where general and specific publics can participate in assessment of new information, new knowledge and new technologies. We are committed to enabling the public to anticipate alternative futures and to their making decisions wisely.

TRANSNATIONAL NETWORK OF RESEARCH-AND-SERVICE COMMUNITIES

-- a proposal for an organizational hybrid

by A.J.N. JUDGE
Assistant Secretary-General,
Union of International Associatio

Approaches to Change

People tend to move or drift through the social system into those groups and organizations which are engaged in the change processes most congenial to them. As individuals develop they may reach stages when a given change process and its organizational support seems unfruitful or unsuited to their desire for self-expression. The individual needs fresh fields to conquer, a new life-style or a new mode of work. The development of the individual implies life-style mobility and organizational and social change. Social change and development requires development of the individual to adapt to new challenges.

The difficulty is that society currently sanctions movement within organizational and career systems but not between them. The individual is therefore forced into one particular mode of self-expression for his whole working life unless he wishes to run the risk of being labelled a grass-hopper or dilettants, or of being viewed as an ignorant outsider (a "foreigner") in the systems into which he attempts to move.

Within one system an individual can of course develop other modes of self-expressio but only as secondary modes within the constant and overriding primary mode (e.g. as an executive in the business system, an individual can move from a high technology corporation to a commercial art corporation; the switch from science to art is contained within the unchanging management framework).

The problem is therefore whether it is possible to provide an organizational setting in which an individual can develop secondary modes of expression and allow any of them to become primary for any desired length of time.

The problem is complicated by the very radical nature of the differences between approaches to change as well as between the corresponding modes of expression of the individual engaged in them. There does not appear to be any systematic listing of change strategies, but the following list is an indication of the variet

- political action
- scientific and technological development
- economic and financial development
- education, training
- art, music
- architectural and machine design, urban planning
- religious faith, prayer
- social engineering, social development
- philosophical or esoteric understanding
- behavioural and perceptual modifications by drugs
- public information, media, propaganda
- community development
- drama, theatre
- organizational development
- legislative action
- military or police action
- direct action, violent civilian protest
- personal encounter, dialogue, sex
- self-exploration, meditation
- mediation, negotiation
- manual labour

The author is indebted to Elise Boulding and John and Magda McHale for encouragemen during the early days of this paper. It does not necessarily reflect their views however

Ironically, the proponents of a particular form of change tend to perceive it as the only viable or significant form (e.g. to a political activist everything of any significance is political). They are unable to detect the manner in which their action is counter-balanced, checked, contained or even undermined by the other forms of change.

The solution to the problem noted above is the generation of some new style of organization which provides continuity to the individual in switching from one mode to another. Clearly such an organization cannot be based on the perceptions of a particular discipline or a particular mode of thought -- for these are the expression of only one aspect of man's personality. The organization needs to be more "primitive" than the many specialized bodies which are characteristic of the fragmented nature of developed societies. It must pre-date the division of labour which sanctions and gives rise to such bodies. Only "organic" organizations, namely communities, in effect contain within themselves the seeds of the many specialized bodies and thus provide a bridge for movement between specialized modes of action. Thus an organizational form is required which can re-absorb many specialized functions. It is not a question of organizational regression but of recovering the necessary generality which can permit new advances to be made.

Before looking at the suggested characteristics of such an organizational form, it is useful to note the wide variety of existing forms. In proposing that the new form be based on a more primitive one, there is no suggestion that some of the more advanced features of existing forms should not be incorporated. Some of these features are in fact a formalization of features and processes present in communities.

Survey of some existing Organization Forms

A wide selection of organizational forms has been roughly arranged into groups (see Annex I). A series of characteristics has been used to differentiate between the forms. The characteristics were selected not so much in order to distinguish clearly between the different forms but rather in order to draw attention to the manner in which each form exemplified each characteristic.

The main characteristics considered of interest in the organizational form to be discussed are as follows:

1. Research: namely the presence of some activity contributing directly to the advancement of scientific or cultural knowledge.

2. Application development: namely the development of new techniques with practical consequences for the activity of the organization or the society in which it functions.

3. Production (for internal use): namely the production of foodstuffs, goods or services within the organization to avoid purchasing them from outside.

4. Production (for external sale): of foodstuffs, goods or services as a means of ensuring financial independence.

5. Services (for needy members): namely the provision of subsidized or free social services to members.

/...

6. Services (for external society): namely the provision of subsidized or free social services to the external society.

7. Social problem concern

8. Direct action (on external society): namely the ability to undertake some programme of direct action (e.g. relief work) away from the organization base.

9. Science/culture compatibility: namely the absence of rigid barriers between scientific and cultural perspectives.

10. Residential.

11. Community: namely a setting in which normal family life processes can take place throughout the complete cycle of generations. Some distorted, partial or single sex environments to which the term can be applied have been scored as (x).

12. Relatively open: namely not specifically restricted to a small class of people with a particular set of qualifications.

13. Non-specialist labour (occupational alternatives): namely the ability of members to choose to switch between intellectual, skilled and manual roles within the organization whenever a change of work mode and rhythm is desired and without being stigmatized.

14. Personal development: namely an expressed concern within the organization for members as maturing humanswithin a psycho-social ecosystem, rather than as economic units or as units being filled with knowledge in order to fit into predefined social slots.

15. Retreat function: namely the facility to permit individuals to take the time required to reconsider the basis and context of their actions -- to be with themselves in peace and quiet.

16. Recreation: namely a concern with individual re-creation as an essential psycho-social process <u>within</u> the organization, in the maintenance of its equilibrium.

17. Security/Isolation: namely the provision of adequate physical protection or isolation from the short-term consequences of social disruption and violence in the external environment.

These characteristics are of course exemplified in different ways in different organization forms. The table is intended as a guide to working out how different ways of achieving the same characteristic can be combined to produce a hybrid organizational form. It is an exercise in selectively combining organizational features and styles.

The scoring for each form against each characteristic is only tentative. It is complicated by the old question of who constitutes the "members" of an organization and therefore where the boundary between the organization and its environment lies.

A similar exercise could be performed for each of the organizational networks corresponding to each of the forms described in Annex I (e.g. the networks of monasteries, banks, youth hostels, etc.). In which case it would be interesting to note how each of the following characteristics is exemplified for each network:

1. Independence of centres: namely their autonomy within the network.

2. Facilitation of movement: namely the extent to which movement of individuals from centre to centre around the network is facilitated.

3. Exchange between centres: namely the extent to which centres exchange products, services and information

4. Movement to and from network: namely the ability of individuals to spend varying lengths of time in the external social environment before returning to the network.

5. Organizational experiments: namely the extent to which the network as a whole encourages innovation at different centres to the benefit of the whole.

6. Organizational variety: namely the ability of the network to tolerate and contain a wide variety of organizational styles and concerns.

7. Independence of networks: namely its ability to act and survive without depending on the external social environment for economic support.

Proposed Hybrid Organization

The various organizational formulae noted above suggest a spectrum of possibilities and not a definitive classification. It is therefore possible to envisage combinations of characteristics from several formulae to give new hybrid organizational varieties which might prove useful in the presently evolving social context. One such hybrid is examined here.

Consider the possibility of designing a center-cum-community combining the following characteristics:

1. The life-style change implied by commune or community living as opposed to the current social fragmentation within urban agglomerations destructive of neighbourhood contacts. Note that this need not imply communal housing but does at least imply a planned grouping of dwellings around a community centre by whatever (psychic) distance the dwellings are separated. This aspect has been developed in the commune (West), commune (East), kibbutz and monastry/convent/ashram formulas. Vacation villages emphasising community living have also developed aspects of this (e.g. Club Mediterrannee).

2. The setting to permit intellectual and cultural study, research and explorations in a manner protected from the compromises and obligations characteristic of university research (e.g. teaching load), grant-aided research (e.g. "relevance" to foundation priorities) and the usual institutional obligations (e.g. administrative duties and unfacilitative working hours). This aspect has been developed inaa number of institutes of advanced studies (e.g. at Princeton) and in scholar retreats (e.g. the Villa Serbelloni of the Rockefeller Foundation).

   The scholar retreat aspect in the case of the example given, has been conceived as a setting in which the final stages of books and studies could be completed in peace and quiet. This facility could make the centre formula very attractive.

3. An emphasis on economic independence if not self-sufficiency to permit the necessary measure of self-control. The centre would therefore either produce its own food stuffs and other necessities or provide in addition or alternatively goods, knowledge or services which can be exchanged in the market economy for the goods or services required. This formula has been developed through the commune (West), the kibbutz, and the monastry/convent/ashram.

4. The setting in which individuals can, if they so desire, rehabilitate and develop themselves psychologically protected from the usual disruptive influences associated with the pace of modern life. This aspect has been developed through the religious retreat (e.g. Taizé), the monastry/convent/ashram, the human potential centre (e.g. Esalen) and in some types of sanatoria and commune (West).

/...

5. The setting to permit alternation at a self-chosen rhythm between intellectual activity (see 2), goods production (see 3) including physical labour, and psychological rehabilitation (see 4). This alternation of modes is usually impossible in most existing working environments despite its value to both the individual and his organization in terms of improved creativity, productivity and relevance.

6. Function as a focal point to which or through which funds can be channelled to catalyze and facilitate creative new approaches to the problems of society, the intellectual tools to solve them and the styles of organizations appropriate to such activity. This is the foundation or trust fund aspect which has already been well developed nationally in the West.

7. A base from which a variety of forms of (multidisciplinary) assistance can be made available to the external social environment (not necessarily with the financial return envisaged under 3). Possibilities include: health, education, community development, care of aged, care of retarded, education of specially gifted, advice, etc. This aspect has been developed through the mission formula, voluntary work camps, and relief agencies. Of special interest perhaps are those bodies offering 24 hour telephone assistance to those facing some personal crisis (e.g. suicide, marital problems, etc.).

8. The setting within which certain types of education could be provided uninfluenced by the restrictions and obligations of the usual courses leading to examinations. This aspect has been developed through the residential conference formula (or institute in the USA), some university summer courses, and a variety of other educational experiments in unstructured settings.

9. The setting within which new types of cultural communication could be developed and made available to the external social environment. Possibilities include: experimental theatre, experimental art exhibitions, and other community involving happenings. This aspect has been developed mostly in ad hoc efforts in connection with each of these possibilities.

10. A social environment protected against dilution of the qualities, which it is interested in developing, by the division and disruptive processes characteristic of modern society. This protectionist aspect has been developed in such organizational formulae as: guilds, trade unions, fraternities, professional societies, secret societies, secular and religious closed orders. Current trends towards increasing violence suggest that some form of physical protection for such a centre may also prove appropriate. The monastic and castle formulae are the best known but recently walled suburbs have been constructed in the USA.

11. A setting which permits the build up of a "critical mass" of multidisciplinary expertise which, through the interaction of the individuals involved, should lead to an enhancement of open-ended creativity. This aspect has been developed in the think tank and special residential conference formulae.

12. A setting which encourages more fruitful and participatory forms of recreational experience than is usually associated with conventional commercialized leisure -- particularly structured spectator sports and media based entertainment.

/...

13. A setting in which experiments in organization can be conducted to perfect means of balancing the psycho-social ecosystem constituted by the many influences brought to interact there. This aspect has to some extent been developed in the commune (West).

Characteristics of the Organization Network

The characteristics of the research and service community noted above concern only the centre itself and not its relationship to other similar centres. Of major importance to the significance of any such hybrid formula are the characteristics of the network of such centres over and above the characteristics of the individual centre. Consider the following:

1. The network provides a safety valve via which the tensions, which often build up dangerously within isolated centres, can be released. Whereas factional conflict within a centre can easily lead to break-up, the network provides a large spectrum of centres in which elements of the discontented faction can hope to find a sympathetic response. This aspect has been developed in the personnel relocation policies of wide-spread organizations such as the services (civil, diplomatic, military), large (multinational) corporations, religious orders, etc.

   Of special significance is that by moving to another centre the individual is not forced out of the supportive network nor is his contribution to it lost. The network functions as a low-key containing device to prevent dissipation of communal energy.

   It is interesting to note that mobility is seen as a stabilizing process within a proposed community and as a safety valve for personality and intergroup conflicts. Members may "move around from house to house and from activity to activity". A mathematical model is being developed to determine the optimum rate of movement of people between groups within a community (+) Inter-community movement is arguably of equal importance.

2. The network approach permits different organizational formulae, concerns and emphases to be adopted and developed in each centre depending on the personaltity types which gradually filter towards each of them over time. The centres would therefore each develop a "personality" or style making them complementary rather than similar in every respect. This specialization of function or mode of operation would encourage an exchange of services between the centres. This aspect has been developed in the kibbutz cooperative system (via which kibbutzim exchange goods between one another), the hospital network (whereby patients may be moved through the system according to the treatment required), the research institute network (whereby a scholar will contact or work at a succession of institutes appropriate to the advancement of his research).

(+) J. Valadez and H.Miall. The Chile Community; a proposed socio-ecological experiment. Peace and Conflict Research Programme Newsletter. Lancaster, November 1972, No. 3, p. 34.

/...

3. The network provides a great variety of educational settings amongst which an individual may choose or to which he may expose himself (if he starts with insufficient information to choose). Movement between these settings is legitimated in this new frame of reference. This aspect has been developed in the youth hostel network formula, in the network of research institutes, in the kibbutz network (which permits visitors and members to move from kibbutz to kibbutz working at each place), in the sea-side club network (Club Méditerranée members take holidays successively in 43 centres, in 19 countries, each with a different style) and in the hotel chain (for example, Holiday Inn or Hilton in which clients moving from city to city and from country to country are encouraged to book into the appropriate hotel in the chain).

4. The existence of the network ensures that if any centre fails and breaks up due to internal problems then individuals can be incorporated into other centres. Alternatively, if a centre is in need, then assistance can be provided. This aspect has been developed in the services (civil, military, etc.) and in large (multinational) corporations.

5. The widespread existence of the network ensures that if any part of it is threatened by external legislation or other pressures, then the key attributes and people may be transferred to more hospitable locations. This aspect has been developed by missionary orders, monastic orders, diplomatic and military services and multinational corporations.

   A network of this type also has a higher probability of surviving, in part, any social disruption and chaos of the type predicted for the near future.

6. As a network, no directing centre or unique administration headquarters is necessary. Different centres may take on such a role for specific issues which emerge and for which they have a special expertise -- but only for the duration of the crisis in question. Leadership roles are therefore transferred throughout the network. The extent and nature of any such centralization will vary with the issue but the major function will be to suggest strategies and adaptions to the operational style of individual centres rather than to take on any detailed directive or decision-making role. This aspect has been developed by mass movements (civil rights, student) and business systems (in which decision-making is highly decentralized or via specially constituted task forces).

7. The network constitutes a reservoir of expertise and experience which can be used to facilitate and nurture the creation of new centres. Assistance could be provided, on request, through the early phases of a centre's establishment, where simple errors may jeopardize its future (cf. the failure rate of communes). This incubator or midwife function could ensure the rapid and healthy development of the network. This aspect has been developed in the "advance party" formula used in the extension of the kibbutz network, the network of offices and factories of large corporations, the network of military bases, etc.

   This approach could also be used to take-over unsuccessful centres external to the network and revivify them.

/...

8. The network provides a secure setting from which an individual may operate in the external social environment and to which he may return when he so desires. The network is not conceived as self-sufficient and isolated from the societies in which it functions but rather as a protection for social experiments not immediately appropriate to such societies and a catalyst and stimulus to any progressive initiatives in such societies. It is however difficult to build into an organizational system sufficient challenge and variety to hold individuals permanently (as the problem of retaining second and third generations kibbutz members has shown). Acceptance of movement to and from the network ensures a healthy turn-over of individuals. Such movement may be on a daily basis as in some open religious communities or for periods of a year or more. The latter forumula has been developed in accepted movement of academics (who retain security of tenure) and corporation executives into and out of the government administration in the USA.

There is a slowly increasing amount of literature on the organizational network theme(+). It is therefore interesting to note the special issue of the Newsletter of the Peace and Conflict Research Programme of the University of Lancaster on the "network dream" which contains a proposal for action research in this connection (++). The editorial is particularly relevant to this section and is therefore reproduced as Annex II.

This network of communities should not be designed or conceived as a finalized structure or mode of organization, but very much as an interlinked set of relative invariances which are in process of self-transformation and self-redefinition to elaborate new organizational potentials, and to reformulate their relationship to one another.

(+) See for example: A.J.N. Judge and Kjell Skjelsbaek. Bibliography of Documents on Transnational Association Networks (SectionE). In: Yearbook of International Organizations. Brussels, Union of International Associations, 1972, 14th edition.

Particularly: Donald Schon. Beyond the Stable State; public and private learning in a changing society. London, Temple Smith, 1971.
John McHale. (The Changing Information Environment; a selective topography) In: Challenge to Leadership; management in a changing world. New York, Free Press, 1973 (for The Conference Board).
A.J.N. Judge. The Nature of Organization in Transnational Networks. (Paper presented to the Dallas 1972 Conference of the International Studies Association). Published in abridged and modified form in Journal of Voluntary Action Research, 1, 3, July 1972, p. 14-24.

(++)Paul Smoker. An Action Research Proposal for Global Networks (Paper presented to the Dallas 1972 Conference of the International Studies Association). Newsletter. Lancaster, 1972, No.3, p.3-19.

/...

Examples

Whilst each of the different types of organizational network described earlier provides an example of some aspect of the hybrid proposed, it is particularly interesting to note the following:

1. The International University (on which action is now being taken under a U.N. General Assembly Resolution of December 1972) is to be a loose network of existing academic centres(+) between which exchanges will be facilitated. Centrally recommended programmes will be adapted to the local setting. This is likely to suffer from the limitations of all intergovernmental establishment projects.

2. The International Peace Research Institute (Oslo) is one of the very few academic research centres which is organized as a democratic community of (partially residential) scholars. All regular staff members participate fully in decision-making and there is a common pay scale for all employees. A portion of subsidies or income received by each individual for research is made over to the community fund. The function of Director is rotated between staff members.

   In addition, the Institute conceives itself to be very much a part of the European network of political science research institutes and is concerned to facilitate inter-institute exchanges of researchers, information and publications(++). It is interesting to note that the Secretariat of the International Peace Research Association (of which the institutes in that network are members) is rotated between the member institutes and is currently at Oslo.

3. Some 17 "think tanks" around the world (a number of which are residential) have themselves recently created an International Federation of Institutes of Advanced Study to facilitate "inter-tank" joint projects, exchanges of people and ideas and: "the building of a new type of community of joint interests and programmes through a continuous and orderly exchange of the plans of member institutes, as well as the collective and comprehensive examination of new ideas, concepts, materials and evaluations of the long-term implications of the consequences of their own work....The uniqueness of IFIAS as an international federation derives from its dedication to inter-institutional cooperation of a transdisciplinary character."

4. The kibbutzim all over Israel are linked together into three partially formalized movements (of different politico-religious tendencies) to facilitate sale of produce and purchase of goods.

(+) The newly established Inter-University Centre of Postgraduate Studies (Dubrovnik) may prove to be a very interesting node in this network. The recently abandoned project for an International Peace Academy (residential) would also have been an interesting organizational node.

(++)Practical problems of the institutes and the possibilities of an increased cooperation between them (Paper presented at the 3rd Conference of Directors of European Foreign Policy Institutes, Chartres, 1971). Oslo, PRIO.

/...

5. The Association Internationale du Canisy (France) was established in 1966 on 8 hectares of land to create a residential research and dialogue centre to facilitate transdisciplinary interaction between specialists concerned with major societal problems. A further 44 hectares surrounding the centre is reserved for members to build their own residences and thus establish a working community.

6. The network of monasteries (e.g. Dominicans) or convents (e.g. Sacré Coeur) belonging to each religious order (Western and Eastern religions) is a well-proven formula in which the residential community, research, production, and service components are combined. Unfortunately, this is done at the expense of nuclear family life and through a denial of relationship between the sexes.

7. The Denmark Peace Research Centre (Hesbjerg) is both an international peace college and a community. The community is made up of two main groups: those taking courses for a small tuition fee,(usually non-residents), and those who engage in activity directly related to the maintenance of the college (e.g. teaching, farming, crafts, cooking, business enterprises, manual labour, etc., none of which are mutually exclusive.) Five hours of work six days a week permit a person to benefit at no cost from all the facilities of the community.

   This centre is conceived as a node in a network made up of the Lancaster and Vancouver peace research centres, hopefully to be extended to centres in Chile and China(+).

8. The cultural revolution in China gave rise to a special institution, the "May 7th Cadre School" (named after the day in 1966 when Mao Tse-tung pointed to the need for them). The commune network is conceived as the major tool for transforming the society, but the cadre school network is the society's fail-safe device. It is the institution designed to prevent the reseparation of government and governed. The principle is that all those whose occupations or positions of leadership tend to separate them from the masses should return regularly to field or factory work. There are no teachers and no staff. Part of the time is spent in manual labour and part in group study sessions when the system has been finally implemented, every official will spend regular periods at a cadre school as a form of sabbatical leave(++).

(+) Information from: Peace and Conflict Research Programme Newsletter. Lancaster, November 1972, No.3

(++)Neville Maxwell. The China Nixon won't see. Sunday Times, 20 February 1972.

Rise of the Network Man

The creation of a network of communities would tend to have a special effect on the behaviour patterns of the members, beyond that arising from the switch to life in an organic community. It introduces an extra degree of freedom. What characterizes "network man"?

There are a number of well-established models which could be examined in the same way as was done for organizational forms:

- wandering scholar (Middle Ages and later), sabbatical leave
- wandering ministrel/troubadour, nightclub artist
- pilgrim, yogi, wandering preacher
- youth hosteler
- hippy hitchhiker
- commercial traveller
- temporary secretary
- adventurer, explorer, pioneer, guide
- international news reporter
- diplomat

Modern society has had difficulty accommodating most of the models, particularly as their independence and "extra-community" status increase. The traditional Indian culture sustained such movement to some extent without requiring an economic service in return. The question is whether some more viable hybrid model of personal mobility within a network could achieve social acceptance as a stable and economically independent mode of behaviour -- and yet at the same time be integrated into an extended community life.

Some possible characteristics of network man have been noted by Donald Schon(+). These were extended by the author in another paper(++) and are reproduced as Annex III.

(+) Donald Schon. Op. cit.

(++)A.J.N. Judge. The Nature of Organization in Transnational Networks. Op. cit.

Economic Viability

It is obviously vital to examine the economic viability of centres as outlined above. The problem is to determine what activities such centres could perform successfully (possibly in direct competition with business enterprises) which would allow them to obtain specialized goods from the external social environment or obviate the necessity of obtaining them. There is a range of possible activities, including:

1. The traditional aim of communities has been to become as independent as possible with respect to the majority of agricultural foodstuffs. This formula has been well explored from that of the almost completely self-sufficient community through to the farm unit specializing in certain agricultural products sold to obtain others required. A variation on this has been the desire to grow foodstuffs "organically", namely without the use of artificial fertilizers and pesticides.

   Clearly a centre could attempt to:

   - survive on its own products
   - sell excess in exchange for other goods
   - function as a market garden
   - specialize in organic foods (the demand for which may be expected to increase with increasing pollution of the environment)
   - obtain foodstuffs from other centres in exchange for services.
   - purchase foodstuffs from the external environment with funds obtained from other services rendered.

   Of major importance however is that agricultural production should not become so demanding in labour that no other activity is possible (as has happened on some communes).

2. Many centres should be able to guarantee their viability through their position in the knowledge industry (predicted to be of key importance in the next decades). Many of the following possibilities should be open to individuals or groups within such centres:

   - research under contract
   - consultancy
   - royalties from patents
   - free lance work under contract in such areas as computer programming, design, surveys, etc.

   Clearly if the centre formula is well-conceived and well-implemented, it would prove very attractive as a living and working environment to intellectuals and creative or dynamic individuals frustrated by the life-styles currently imposed upon them. The brain drain towards the commune movement has been frequently commented upon.

/...

The centres could therefore legitimately hope to build up considerable intellectual and creative resources which would prove of interest to the external social environment and thus provide an important source of income.

The strategy of the centres in this respect would be to maintain an intellectual, cultural and qualitative advance over the external environment so that the services of its members are continuously required. The centres maintain their advantage as centres of excellence and quality.

3. It has frequently been remarked that with the emphasis on mass production, mass markets and planned obsolescence, there is a diminution in products and services characterized by quality. In this they would have the advantage that the labour intensive nature of such work would not render the product un-economic precisely because members of the centre would not be required to structure their working hours and remuneration in the same manner as in the external society. A "fair wage" is inversely proportional to the personal fulfillment derived from the work - and this is much higher with quality products on which the person wants to work.

There is no reason why such high technology products as quality hi-fi equipment and automobiles (which often start as back-yard operations anyway) should not by produced by appropriate enthusiasts. The same is true for craftware and the elements of internal decoration (furniture, materials, pottery, etc.).

4. There are certain types of business which centre members might wish to operate. The publishing industry provides a good example. Certain books and periodicals for which there is a market (and which in many cases could represent the development of the interests of centre members) are not published because of the costs of production. Given the commitment of individual centre members, a variety of such publications could be produced to the economic benefit of the centre.

There is no reason why centres should not purchase currently operating businesses and develop them. The manner in which churches use funds obtained primarily by tithing is a good example (e.g. Mormon control of businesses in some parts of the U.S.A.).

5. Given the life-style and attractiveness of the centre setting to the culturally-creative, some centres could obtain an income by providing various entertainment services. Possibilities: theatre, cafes, restaurant, art exhibitions, etc. It is interesting to note that restaurant and evening entertainment at the constituent villages of the Club Mediterrannée is open to the external community for a (commercially competitive) entry fee. Again, such services could compete successfully with commercial enterprises through the centre formula emphasis on quality, style and atmosphere.

/...

6. Some centres may be well suited to deriving income from the international conference market. There are increasing numbers of small specialized conferences (often with aims which the centre would wish to support) for which it is difficult to provide a suitable setting - even though funding is available. Provision for such conferences on a residential basis should give rise to a useful income. Again, demand would increase if the centre could develop its ability to provide the atmosphere and physically setting conducive to the exchange of ideas. The presence of meeting participants might also, incidentally, ensure a valuable input to the centre community. This formula has been developed in part in some university research institutes in corporation country retreats, and in foundation supported scholar's retreat (for example, the Rockefeller Foundation's Villa Serbelloni).

Of particular interest is the possibility that some centres might obtain income by caring for groups of people for which society's services are often inadequate. The aged, specially gifted, mentally retarded or physically handicapped are good examples. One or more such groups could be housed in appropriate facilities adjoining the centre (to avoid affecting its other activities although note the unique example of the Dutch village in which all families offer a home to non-violent mental patients which then have a place in a real community.). The needed special assistance could then be provided by centre members possibly within certain hours only if they are not resident. Individual and group psychiatric and psychotheraputic treatment might, for example, be provided on the latter basis. (The unique example of the Dutch village in which non-violent mental patients reside in the homes of the villagers and circulate freely throughout the community may be worth emulating.)

Centres would again have a special advantage in that the relatives of such individuals are often very anxious to obtain the best services available provided the cost is reasonable. Therefore, provided the centres can guarantee quality care in a physically and socially pleasant setting at a reasonable cost, this service could be a valuable source of income. From the internal viewpoint it also provides a very practical area of action for centre members which can be very fulfilling for certain personality types (often the male or female partner of the more academically oriented).

This service also fulfills another important function in that it improves relations between the centre and the external community. If a centre cares for the underprivileged, it has much more sympathy than if it sets itself up as an exclusive think tank community.

This aspect has been well-developed by a number of religious orders and in part by voluntary bodies which care for these groups. The Salvation Army hostels are well-known as a haven for the destitute, another group which might be considered but for whose support funds must be obtained by appeal.

8. Related to the previous points is the possibility of operating some form of health or convalescence centre to which individuals could come for a fee. Given the expertise which should be available, maternity clinics and nursing homes could also be operated. As before, these are services in which unscrupulous commercial bodies are increasingly evident to the disadvantage of many individuals who cannot afford the very high prices. If the centres can establish a reputation for quality service at reasonable rates, then competitive success is assured.

/...

9. The current organization of society does not always provide a physically and socially suitable environment for those seeking a place of retirement. Some centres might be able to create the right setting to attract intellectual and cultural leaders. Some facilities could then be provided which would generate a certain income. Such people might be involved in other centre activities as "associate" members. The retirement village formula is quite well developed in the U.S.A.

10. Other centres might choose to sell office services and facilities to external organizations of a certain type. In some areas there are large numbers of voluntary bodies with very similar administrative problems (mailing lists, accounts, duplication, etc.) which could best be resolved by a professional service provided the costs are reasonable. This formula is well-developed commercially but the voluntary organization market has hardly been explored. This market has the advantage that it may be related to the facilitative aims of the centre.

    A related income generating activity is the "switchboard function" whereby the centre provides contacts at a fee. Freelance individuals (possibly in the centre network) with services to offer, can be brought in contact with bodies requiring the services. Possibly an employment agency for out-of-the-ordinary jobs could be operated. Various kinds of referal service for specialized enquiries could be envisaged.

11. As well as the possibility of generating income through research (see 2), there is also the possibility of applying research insights to the development of new products which can be patented and manufactured (possibly under license). Of particular interest is the recently named "soft" technology or "intermediate" technology. This is designed to be significant in the less developed areas as well as being environmentally sound.

Organizational Questions

As well as the viability of the centre as an economic unit, its viability as an organization must be examined. There is much experimenting with new forms of organization, the policy determination and member participation. This is not the place to draw final conclusions even if this were desirable. The following points are therefore only a few possible suggestions for the organization of some of the centres. Different organizational recipes may of course characterize different centres.

1. The membership structure of a centre may be very varied. A core of fully committed members may be envisaged with several other categories of membership of successively lower commitment.

2. The permanence of membership may also vary. Some members may be permanent, others may stay for extended periods (years), others for short periods (months), and others for brief periods (weeks or days).

3. The nature of the contribution of the member to the activity of the centre may also vary. Some members may be engaged in intellectual or other activities which are economically of direct benefit to the centre. Others may be engaged in activities which are important to the psycho-social stability of the centre. Some may be assisted by the centre and others may be using the centre as resting place of some kind.

4. The financial contribution of members to the centre may also vary. For example, the land for the centre may be purchased as a condominium by a core group of members. Some members may donate lump sums to the centre, others may arrange some formula whereby the centre receives interest on capital controlled by the member. Members may choose to finance their stay by some form of economically productive activity. It may also be possible to have some form of direct payment according to the class of accommodation and living-style desired by the member (e.g. hostel, apartment or isolated cottage). Finally, some members will be financed in whole or in part by the centre itself.

5. The above variety of member activity, permanence and commitment should be reflected in the manner in which centre policy is determined. The most satisfactory approach would probably be a rather complex weighted voting system. This could, for example, be based on a vote allocation to each member determined by his contribution to the centre under categories such as the following: permanence, value of activity to the collectively, financial contribution, etc. The value of votes under each category could possibly be modified over time to maintain the stability of the centre.

6. The number of members a centre can successfully handle bears careful consideratio Too small and the centre may not be viable either economically or as a psycho-social organism. Too large and the centre may become excessively impersonal and of necessity over-organized.

/...

It is interesting therefore to note a scale of "natural" size limits noted in particular by Anthony Jay(+). He indicates 6 to 10 as the core group size (e.g. of the centre activists or elders), about 30 to 50 as the number of the group in which the activists function, and about 300-600 as the community within which face-to-face contact is still meaningful.

There may therefore be a strong case for encouraging centres to split or spin-off breakaway movements of dissidents in order to keep the centres as organic systems.

Relations with External Authority

Centres of the type envisaged cannot be established without taking into account the relationship to external authority (local government, national government or inter-governmental agreements) although this may occasionally be possible when an informal organizational structure is adopted. The nature of the relationship between a non-governmental (non-profit) body and government varies very much according to the law and practice in different countries. Government in general is particularly anxious to ensure that the structure and activities of an organization do not lend themselves to tax evasion, maltreatment of minors, abuse of privilege, or subversive activities. The latter may be very widely interpreted - particularly if the centre in question is in contact with others in countries which permit expression of more critical opinions.

The following points might be considered although the controversial ones represent desirable rather than necessary steps:

1. The most appropriate legal form for the centre should be adopted to permit it to carry out its activities in the country in question. In some countries this may therefore result in the creation of an institute, in others an association, a religious body, a business, a cooperative, a farm, etc.

2. The ideal is undoubtedly to move towards some form of extra-territorial status as was accorded to monasteries in earlier periods (and which still carry over in some countries today). This removed the centre from local governmental pressures and gave it some special relationship to the national government. Clearly governments would be very chary of re-establishing this precedent.

3. The centres could benefit tax-wise in some countries by being established as charities or their equivalent. A corporation structure may however give greater freedom even though the image may be more suspect.

(+) Anthony Jay. The Corporation Man. London, Jonathan Cape, 1972.

4. Portions of the network of centres may link together more formally in international organizations (e.g. International Federation of Institutes of Advanced Study, International Cooperative Alliance). This may in the future provide a means of obtaining a special international status of benefit to the individual centres(+). Such organizations can already have a special relationship with intergovernmental bodies such as the United Nations although this is not without its difficulties(++).

5. Aside from the status of the centres themselves, that of the members must also be considered. Where all members are from one country this raises no problem, but where many are from other countries, income tax, health insurance, life insurance, social security and pension rights must be examined. Whilst these problems are avoided in intergovernmental bodies and increasingly for the staff of multinational corporations, they have not been resolved for individuals in other types of bodies. Individuals may have the status of visitor/tourist, business man, employee or scholar/student in a foreign country but they are bound by many restrictions.

   An interesting precedent which might be reactivated is the "cultural passport" conceived in the post-war period as a means of facilitating the movement of scholars and artists(+++). The very recent creation by the United Nations of a corps of UN Volunteers to work in developing countries may also suggest means of providing an international legal status to private individuals.

   It is also appropriate to mention the efforts to promote use of an international passport. These must have given rise to much thinking which could be applied to a travel document for persons moving through the centre network. Such developments are not, however, essential to the functioning of the centres.

(+) See A.J.N. Judge and Kjell Skjelsbaek. Bibliography of Transnational Associati Networks. In: Yearbook of International Organizations, Brussels, Union of International Associations, 1972.

(++)Op. cit., section D.

(+++)Council of Europe. Cultural Identity Card. Strasbourg.
Attempts have also been made to develop identity cards for scientists and journalists. The international youth hostel and student cards are also interesting models.

Style, Image and Survival

The style and image of the communities and the network as a whole, are very important to the long-term survival of the network. The network of monasteries survived through the Dark Ages by maintaining a non-violent, non-threatening style, offering needed services to the community, functioning as sanctuaries, and as centres of excellence. The monasteries, at least in Britain, were attacked as a network by the king when the style deteriorated and the approval of the people was lost.

The monasteries had the special advantage of being spiritual centres. What equivalent image is appropriate to the communities proposed? The image of "centres of excellence", "quality of life", "creative fulfillment" and "psychotherapeutical sanctuaries" is perhaps a good beginning. But this would not be a protection if the centres are in any way elitist or exclusive. (The drift in style from excellence to elitism is very difficult to detect.) They must therefore complement this image by one of "providers of needed services" to the external social environment.(+) This is the only way they can weather the predicted period of social chaos and arbitrary government.

A minimum of physical security or isolation is required, as with the monasteries, but the key to survival is in the psycho-social protective mechanisms. A collection of case studies of monastery-society relations during the periods of social chaos could prove most valuable.

Conclusions

This proposal has been made as though an entirely new network of "research and service communities" (R-S communities"?) would have to be created. This is not so. There are a number of communities already in existence which have characteristics corresponding in many ways to those defined here. A number of inter-community networks exist, at least informally. It may be sufficient to think in terms of the model and relate new communities to existing networks. On the other hand, perhaps some existing networks (e.g. monasteries, youth hostels, research centres) could usefully develop the additional characteristics, and convert themselves into communities of the type proposed.

It is an interesting point whether the development of any such network should be consciously planned and organized to any degree in terms of any evolving models or whether knowledge of it should be spread widely. It might be better to simply recognize the existing organic developments and to allow knowledge of the network to be disseminated selectively and haphazardly to those with sufficient affinity to it. This "natural" filtering process might prove the best method by which to protect the growth of the network and to avoid clogging it with people parasitical to it. In which case it is questionable whether anything should be done about this proposal.

(+) "Transparency" and "openness" are also important. The protection of the network against being swamped must lie in the nature of the life-style. Excellence and quality could be effective "natural" repellents without depending on elitism.

University of Lancaster, Peace and Conflict Research Programme

Editorial, Newsletter, November 1972, No. 3

This newsletter is about the network dream.
The network is an attempt to put peace research into practice in a way which takes account of its ecological and cybernetic insights. Network type organizati have enough complexity to respond to change and stimulate variety. Their survival may not be dependent on the survival of any one of the nodes at the same time all the nodes are interdependent. Networks are thus relatively invulnerable organizations. It is anticipated that the local nodes will develop into experimental societies which deliberately attempt to investigate and create alternative forms of organization and alternative futures. They will have enough isolation to develop their own forms of social and cultural change, but enough connectedness to assure co-ordination.

We believe that societies of the future must be based on a grasp of ecological science rather than technological science. This includes a knowledge of the principles of social dynamics, personal and interpersonal psychology and systems co-ordination. They will be very much more aware of their interaction with the natural environment. They must be in continuous adjustment, so as to remain adaptive: maladaptive behaviour will have to be discarded without physical or structural conflict. In other words they must be self-organizing, naturalistic, not controlled from outside.

The idea that they should be adaptive suggests an 'evolutionary' design - there should be a lot of communities all trying different ways. These communities are connected to some extent so that when particular communities develop favourable features, these features can be selected in by other nodes or by the whole networ Variety should be designed into the alternative societies both at the individual and at the social levels. Individual communities may develop their own world vie and characterstic sociocultures, but contact (through the exchange of informatio and individuals, participation in the same experiments, and collaborative compute simulation) might prevent the divergence of the nodes becoming unco-ordinated. In a way the nodes will cross-pollinate one another with ideas and experience so that the network may become more than the sum of its parts.

In line with this idea it is important that the network should have nodes in very diverse ecosystems, so that as a whole it will have experience in dealing with different ecological conditions and with the global biosphere. For example the different nodes might adopt different types of social organization to adapt to their local environs but the network as a whole may develop experience of the relationships between natural and social systems and of what types of change in one are appropriate to changes in the other.

A further suggestion is to establish one node in a warzone or a devastated ecosystem. This is to give the network variety over time as well as space -- this node might be simulating the future for others and experimenting in survival procedures.

Current trends suggest that the planet will be devastated by nuclear warfare and ecological collapse in the time span over which this network is evolving. There may be major disruption of the planet's ecosystems, complete collapse in the industrial city-based civilization and breakdown of existing transport and

communication systems. Perhaps before this, the network may have to face increasingly severe political constraints as the Malthusian cracks and their various social repercussions begin to take effect. A decentralised organization of small, self-sufficient societies, developing intermediate technologies and alternative communications systems might be a viable alternative to industrial society as a survival strategy.

At any rate, the network as a whole will be an experiment in this type of global future. Network dynamics have been studied by cyberneticians but have only begun to be considered in terms of societal and intersocietal organization. In terms of patterns of information flow, self-organization, and creative interaction between the nodes, there would be many opportunities for innovations and experimentation.

(.....)

Some Network Roles

The following roles are open to "network man". Clearly some are more relevant within the research-and-service community network then others, although because the descriptionshhave been phrased for organization rather than community networks, the relevance is not always apparent.

1. Value or goal generating and maintaining role

2. Research roles
   - model elaboration continually relating more factors together
   - model development

3. Interpretative roles
   - communication of insights to other specialists of the domain
   - interpretation for neighboring specialist domains (scientific journalism)
   - interpretation for program experts
   - interpretation for policy formulation
   - interpretation for organization's constituency
   - interpretation for general public

4. System defining roles
   - interrelation of elements of network emerging from different specialists' models
   - education concerning system

5. Information roles
   - provision of information systems able to store, inter-relate and supply data on and for all elements of the network
   - provision of widely known channels via which suggestions can be funneled to an appropriate level for consideration (by-passing units locked into conservative procedures)

6. Look-pout roles
   - detect and define the nature of emerging problems and draw their existence to the attention of the appropriate bodies in the network

7. Emergency roles
   - reorient and rapidly mobilize available organizational resources in the network in response to crises for which no existing official body in the network has a clear responsibility.

8. Involving roles
   - formulate appeals to general public calling for support possibly by clarifying the human interest and emotional content of the issue.
   - suggest and facilitate entry of the previously uninvolved to participative roles in the network.

9. Strategy or policy formulation roles
   - clarify the problems likely to emerge on a long-term basis
   - formulate long-term strategy for action within the network in the light of the models and organizational resources available.

10. Broker roles (+)
    - assist parties to identify one another, serve as a channel for information supplementing the parties' own information systems

(+) These and the following roles are adapted from Donald A. Schon, op. cit. p. 198-200

/...

- negotiate deals between the parties
- clear away institutional, regulatory and administrative debris which stands in the way of transactions
- maintain a special network cutting accross critical elements of the networks to be dealt with, which would otherwise be disconnected.

11. Systems negotiation roles
    - ombudsman, guide, middleman or "tolkatch" serving as the vehicle by which others negotiate a difficult, isolated rigid or fragmented network.

12. "Underground" manager roles
    - maintains and operates a coherent network across jurisdictional lines, possibly performing functions having little to do with the formal agencies.

13. Manoeuverer roles
    - persuades or coerces institutions to make shifts in policy and procedures to make possible a project that cuts across institutional lines in the network.

14. Network manager roles
    - oversees official networks, assuring the flows of information, the processes of referral, tracking and follow-up, and the provision of resources required for the networks to operate.

15. Facilitator roles
    - fosters (as consultant, expediter, guide and connector) the development and interconnection of regional or specialist organizations in the network, each of which constitutes a variant of central themes of policy or function.
      provide the mete functions of training and consultation which enable regional bodies to establish and maintain their own networks.

ANNEX I

	Research	Application development	Production (internal use)	Production (external sale)	Services (needy members)	Services (external society)	Social problem concern	Direct action on external society	Science/culture compatibility	Residential	Community	Relatively open (non-exclusive)	Non-specialist labour (occupation altern.)	Personal development	Retreat function	Recreation	Security/isolation
A. Knowledge storage																	
Library	X					X						X			(X)	(X)	
Museum	X					X			X			X					
Arts centre						X						X		(X)		(X)	
Art gallery						X						X				(X)	X
Record library						X						X				(X)	
B. Knowledge advance																	
Think tank	X	(X)		(X)			(X)			X					X		X
Research institute	X	(X)		X			(X)										(X)
University city	X	X	X	X	X	(X)	(X)		(X)	X	(X)	X	(X)				(X)
Scholars retreat	X								(X)	X					X		X
C. Community																	
Commune (east)			X	X	X					X	X	X	X			X	
Commune (west)			X	(X)	X					X	X	(X)	X	X	X	X	(X)
Kibbutz			X	X	X	(X)				X	X	X	X		(X)	X	X
Cooperative			(X)	X			(X)					X					
D. Esoteric																	
Church					(X)	X	(X)				(X)	X		X			
Monastery, etc	(X)		X	(X)	X	(X)	X			X	(X)	(X)	X	X	X		X
Retreat					(X)		(X)			X		X	(X)	X	X		(X)
Esoteric school							(X)		X					X	(X)		(X)
Growth centre	(X)				(X)		(X)		(X)	(X)		X	(X)	X	X		(X)
E. Social																	
Youth hostel										X		X	X			(X)	
Youth club					(X)	(X)		(X)		(X)		X	X			X	
Sports club												X				X	
Summer camp										X	(X)	X	X	(X)		X	
Sea-side club										X		X				X	
F. Protectionist																	
Guild					(X)												
Fraternity					X											X	

Rotary,etc				X	X	X	(X)				X				X	
Business club									(X)		(X)				X	
Professional assoc.	(X)		(X)		(X)	(X)					(X)					
Trade union				(X)		(X)	X				X					
Country club									(X)	(X)	(X)				X	
G. Development																
Mission		(X)	(X)	X	X	X			X	(X)	(X)	(X)	(X)	(X)		
Volunt. work camp					X	X	X		X		X	(X)				
Arbeitsdienst					X	(X)	X		X		(X)	(X)				
H. Entertainment																
Musical group	(X)	(X)	X		(X)								(X)		X	
Choir		(X)	(X)		(X)						X				X	
Circus, fair		(X)	X	(X)	(X)				X	X	(X)	X	(X)		X	
Theatre group	(X)	(X)	X		(X)	(X)			(X)	(X)	(X)		(X)		X	
I. Education																
School						(X)		(X)	(X)		X		(X)		(X)	
University	X	(X)	(X)		(X)	(X)		(X)	(X)		X					(X)
Staff college									X							
Seminary						(X)			X				(X)	(X)		
Cadre school(China)						X	(X)	(X)	X		X	(X)	(X)			
J. Finance																
Foundation	(X)	(X)				X		(X)								
Trust, fund						X										
K. Dynastic																
Chateau		(X)	(X)	X					X	X		(X)				(X)
Hacienda,ranch		X	X	X					X	X		(X)				(X)
L. Specialized services																
Travel club		(X)		(X)							X				X	
Book club											X				X	
Investment club	(X)	(X)									X					
Secretarial services			X								X					
M. Health																
Hospital	(X)	(X)	(X)	X	(X)	(X)			X	(X)	X					
Rehabilitation inst.			(X)	X	(X)	(X)			X	(X)	X			(X)		
Sanatorium	(X)		(X)	X	(X)	(X)			X	(X)	X			(X)		(X)
Medical centre	(X)	(X)	(X)	X	(X)	(X)					X					
Old age home			(X)	(X)	(X)	(X)			X	(X)	X			(X)	X	
N. Exploration																
Archeological dig	X			X				X	X		(X)	(X)				
Expedition	(X)			X	(X)				X			(X)				

Outward bound cnt.					X		(X)			X		X	(X)	(X)		(X)	
O. Commercial																	
Shop				X		(X)						X					
Factory	(X)	(X)	(X)	X	(X)					(X)	(X)	X				(X)	
Hotel, motel				X	(X)					X	(X)	X				X	
Cafe				X	(X)						(X)	X				X	
Bar, pub				X	(X)						(X)	X				X	
Market garden				X													
P. Economic																	
Stock exchange				(X)													
Commodity exchange				(X)													
Market				(X)							(X)	X					
Labour exchange					(X)	X	(X)					X					
Bank				(X)		(X)						X					(X)
Q. Military																	
Military base		(X)	(X)		X			X		X	(X)					X	X
Police station					(X)	X	X	X								X	X
R. Recyclage																	
Residential conf.	(X)						(X)		(X)	X		(X)					(X)
S. Communication services																	
Airport			(X)	X	(X)	(X)						(X)					X
Rail station			(X)	X	(X)	(X)						(X)					
Port			(X)	X	(X)	(X)						(X)					X
Radio/TV station				X		X	X		X		(X)					X	(X)
Newsagent				X		(X)			X			(X)					
Post office				X		(X)						(X)					(X)
Telephone exch.				X		(X)						(X)					(X)
T. Government																	
Ministry			(X)	(X)	(X)	(X)	(X)										(X)
Embassy			(X)		(X)	(X)	(X)			(X)	(X)					(X)	X
Cultural mission						(X)			(X)			(X)					
U. Designed settlements																	
Auroville			X		X	(X)	X		(X)	X	X	X	X	X	(X)	X	(X)
V. Special interest																	
Association				(X)	(X)	(X)	(X)	(X)				X	(X)			(X)	

ote: Owing to lack of time, unfortunately we are unable to translate this paper into English before going to press.

FEDERALISME ET PROSPECTIVE

Recherche systémique

par Alexandre Marc
Centre International
de formation Européenne

A l'issue d'un colloque réuni par l'O.C.D.E. et consacré à la prévision et à la planification à long terme, un professeur de l'Université de Pennsylvanie, Russel L. Ackoff, résume à sa manière les tâches qui incombent aux planificateurs dignes de ce nom:

"1. élaborer une répartition internationale et nationale de la richesse (...);

2. concevoir et faire fonctionner de nouvelles formes d'institutions qui puissent réduire ou éliminer les conflits (...);

3. concevoir et fair fonctionner de nouvelles formes d'institutions (...), afin de renouveler notre vision du possible et (la) transformer en réalité". (1)

Quelques concepts introductifs

Qui ne voit que de telles exigences debordent l'étude de la planification stricto sensu puisqu'elles pré-définissent le concept de révolution nécessaire. Phénomène de dé-bordement ou de dé-rivation qui - aujourd'hui plus encore que jadis ou naguère - joue pour nombre de concepts importants. Que l'on songe à la série dans laquelle figurent, parmi d'autres, des termes comme prévision, anticipation, futuribles , futurologie, prospective; ou à une autre série qui englobe forme, essence, structure, catégorie, ensemble, système; ou encore, à celle qui va d'organisation à planification, en passant par rationalisation, régulation, programmation, etc.; ou enfin, à la série déjà amorcée qui aboutit à la révolution, non sans avoir suscité d'autres

termes: révolte, réforme, mutation, transformation et transfiguration. Il ne serait pas difficile de trouver d'autres exemples qui illustreraient notamment l'utilité de l'analyse intrasérielle: comment pourrait-on prétendre à "balancer" sans cela, tant soit peu rationnellement, des concepts, trop souvent fluctuants, qui ne peuvent être définis que les uns par rapport aux autres, les uns par les autres? En paraphrasant un philosophe allemand, Heinrich Rombach, on peut dire que les concepts ne se déterminent qu' "à partir" de leur appartenance à un ensemble. Pris en eux-mêmes, ils n'ont aucun sens.

Mais ce n'est pas tout; il y a plus: si l'on dégage de chaque série un mot-clé, un concept "suprême" qui, d'une certaine manière, subsume en lui les autres termes de la série, on découvre entre ces "clés-de-voûte" des relations multiples dont le réseau se prête à l'analyse intersérielle. Ce qui justifie amplement la remarque méthodologique d'un physicien, P. Delattre, qui, dans un ouvrage intitulé ambitieusement "Système, structure, fonction, évolution", rappelle cette verité première, si souvent négligée: "La présentation discursive se prête mal à l'analyse de notions dont chacune, pour être précieuse, nécessiterait la définition complète et préalable des autres. D'où la nécessité de procéder à de fréquents retours en arrière, ou à des renvois à des approfondissements ultérieurs. On est (...) conduit à reprendre, à diverses étapes (...), une même question qui se précise peu à peu à l'aide des nouvelles données acquises" (30 ii).

Ainsi en est-il notamment des rapports entre les concepts les plus significatifs, comme ceux par exemple de prospective et de système. Les relations qu'ils entretiennent l'un avec l'autre tendent à susciter entre eux une sorte de solidarité dialectique. Au sens scientifique des termes, il n'y a de prospective que dans la mesure où il y a système: c'est dans la perspective de la théorie générale des systèmes que peut et doit se situer la construction de l'à-venir. En contrepartie, il n'est pas interdit de se demander s'il peut y avoir un "véritable" système qui ne soit, de quelque manière, fondamentalement prospectif. C'est ce qu'affirme L. von Bertalanffy lui-même en disant que les "system-theoretical arguments pertain to, and have

predictive value" (souligné par moi (61 ii), p. 31). C'est ce qui laisse aussi entendre Hasan Ozbekhan (dans l'ouvrage cité sous (1), en rappelant, d'une façon quelque peu téméraire, que l' "objet" auquel peut s'appliquer la prospective - ou la planification - "est un système", et qu'un système, plus encore que de "faits", est composé de "futurs", de sorte que "la prescription" en vient à l'emporter sur la description".

Le concept de fédéralisme

Rencontre au sommet des concepts, devenus idées, voire idées-forces, au fil de ces dé-rivations imprévisibles qui, en ultime syn-thèse, tissent la réalité concrète (2). Mais si un tel rapprochement risque déjà d'inquiéter, voire d'indisposer, un certain positivisme, celui-ci serait sans nul doute scandalisé si l'on faisait mine d'étendre la portée de l'observation méthodologique esquissée ci-dessus à d'autres concepts, apparemment d'une tout autre nature, comme celui de fédéralisme: or, c'est précisément ce que je me propose de faire ou tout au moins de tenter.

Certes, le terme de fédéralisme doit être pris dans son acception englobante. Dégagé à l'origine d'une expérience perçue comme politique, notamment à l'occasion de la Convention de Philadelphie, il s'est enrichi, à partir de Proudhon, d'apports économiques et sociaux. Néanmoins, de notre temps encore il a fallu lutter contre les conservateurs qui s'obstinent à n'appliquer le terme de fédéralisme qu'au domaine des relations inter-étatiques. Toutefois, à la faveur des complications, des difficultés et des contradictions surgies au cours du processus de construction européenne, à la faveur aussi de ce qu'on appelle l'expérience yougoslave, une brêche a été ouverte dans les remparts de la forteresse conservatrice. Même les esprits les plus obtus commencent d'entrevoir, encore vaguement, que rien ne peut empêcher les principes régulateurs dont la composante politique du fédéralisme a permis de construire le modèle, de s'appliquer pleinèment à l'économie en tant que telle, voire à la société dans son ensemble.
En revanche, très peu nombreux sont ceux qui se rendent compte du fait que le rapprochement dialectique des trois termes: fédéralisme, prospective et système, loin d'être arbitraire, puisse, aujourd'hui, en-

richir singulièrement leur champ d'investigation et d'application. Et pourtant, en soumettant le fédéralisme à une analyse systèmique n'est-on pas conduit à reconnaître, à la fois:

- qu'il est un système,
- qu'il est un système prospectif?

A la lumière du système prospectif remplissant à son égard le rôle d'un métasystème, le fédéralisme se déplie - au délà de son sens initial ressortissant au politique, au délà de son extension économique et sociale, au delà même du sociétal englobant - comme une tentative d'atteindre le point que Jantsch paraît désigner en parlant de la "conception de systèmes conjointe dont la société est un des éléments seulement" (3).

Encore ai-je évité, pour ne pas surcharger le bateau, d'évoquer un quatrième terme de référence, pourtant utile, éclairant, nécessaire, celui de révolution. On y reviendra ultérieurement.

Faut-il souligner que j'ai évité aussi de définir le terme de système. Une telle entreprise nous entraînerait trop loin. En m'inspirant de l'une des définitions proposées par Robert A. Orchard, je me contenterai de dire qu'un système est un ensemble d'éléments (ou d'états) et de relations entre les éléments (ou de transitions entre états). Il est vrai que le même auteur admet pour un système "caractérisé positivement par ses traits permanents" ... trente et une définitions! N'est-ce pas introduire, dès l'origine, une dangereuse incertitude anti-scientifique? Qu'il me soit permis de mettre momentanément cette question entre parenthèse, ou bien encore d'y répondre paradoxalement, à la manière d'A. Wayne Wymore (auteur d'une "Wattled Theory of Systems"): "... il est nécessaire d'être très précis quant à ce qu'un système est; en dernier ressort, il y aura peut-être une théorie dont système constituera le terme non défini" (cf. (61)[ii], pp. 220-21 & 288).

Diachronie et synchronie

Quant au mot "aujourd'hui," ce n'est nullement par hasard qu'il figure dans l'une des phrase précédentes où sont rapprochés les termes de système, de prospective et de fédéralisme; au contraire, il

est à souligner. Il se situe en effet dans la ligne des préoccupations actuelles qui, nouvelles pour Leo Apostol, se reflètent notamment dans les deux passages suivants, réunis en une seule citation:

"Une théorie T_1 est une explication d'un phénomène P à un moment n, en fonction des descriptions précédentes de ce phénomène P, et en fonction des théories précédentes qui ont préparé la théorie T ... C'est la forme de transformation des structures intellectuelles les unes dans les autres, qui servira de prototype aux modèles explicatifs et non pas une structure de transformation intellectuelle particulière qu'elle soit ..."

Toutefois, cette citation notable dont l'historicisme - le mot est de l'auteur - exprime un certain désenchantement, mérite d'être équilibrée, ne fût-ce que provisoirement, par ce commentaire de Jean Piaget, sur lequel il faudra du reste revenir.

"... Ou bien la "transformation des structures intellectuelles les unes dans les autres" s'effectue sans raison, à la manière des "episteme" dont nous parle M. Foucault (...), ou bien chaque transformation comporte nécessairement un double mouvement réflexif ou rétroactif assurant une meilleure compréhension des structures précédentes, et intégratif ou proactif assurant la subordination, avec assimilation réciproque, de la structure actuelle à celles qu'elle conduit à construire ... L'intelligibilité tient à la cohérence de cette totalité sans cesse restructurée en son devenir continuel et par conséquent à une nécessité qui est à chercher, non pas dans les points de depart à la manière kantienne, mais dans les points d'arrivée en tant que fermetures relatives accompagnées d'ouvertures sur de nouvelles constructions (4)".

La cohérence de cette totalité sans cesse restructurée n'est-elle pas précisément celle du système, non point au sens péjoratif que j'ai souvent dénoncé (et qui excluerait, lui, le "double mouvement"), mais au sens scientifique du terme? Et les precisions concernant le dépassement des structures acquises par celles qu'elles aident à construire, ainsi que la pro-jection paradoxale de la "nécessité" vers le futur, vers les points d'arrivée, vers des ouvertures multiples, ces précisions ne permettent-elles pas de confirmer le caractère irréductiblement prospectif du système ainsi défini?

Coup d'oeil rapide sur l'histoire du savoir

Les réflexions qui précèdent incitent, pour ne pas dire obligent, à considérer un thème comme "fédéralisme et prospective" sous un angle à la fois épistémologique et méthodologique. Il s'agit de situer ce thème par rapport à la dialectique du savoir. Ce faisant, je risque de paraître laisser mon sujet de côté; il est à espérer que nous le retrouverons en conclusion, considérablement enrichi, grâce à la perspective générale que j'ai déjà essayé d'esquisser (5), mais que l'on n'a jamais fini d'explorer.

Si l'on commence par poser le savoir comme histoire - L. Apostol n'a point tort de vouloir compléter ainsi la synchronie - on discernera, au sein de cette diachronie, deux composantes tendancielles, apparement opposées: d'une part, vers l'unité du savoir; d'autre part, vers sa différenciation. Ce sont sans doute ce que j'appelle des positions--limites dont aucune ne peut être atteinte. Toutefois, mon propos n'étant pas vraiment historique, on peut dire, en semplifiant, que la première position-limite se manifeste pendant la phase qui va de l'antiquité grecque à la fin du moyen âge, caracterisée d'abord par une unité de type philosophique, ensuite de type théologique; la seconde position-limite se profile dès la naissance des temps modernes, avec l' "émancipation progressive des différentes sciences: astronomie, mécanique, droit, économie, chimie, physique, histoire, sciences naturelles, sociologie, etc. Cette tendance se perpetue jusqu'au début du XXe siècle, conduisant aux excès de la spécialisation conçue comme un idéal, suscitant une sorte de savoir en miettes. Savoir qui, à la limite, paraissait ne plus déboucher sur rien:

"La prolifération de disciplines, sous-disciplines et spécialisations menaçait de fractionner la communauté scientifique en secteurs isolés les uns des autres, incapables de communiquer les uns avec les autres. La science menaçait une avalanche de "trouvailles" ("findings") qui, même dans leur totalité, ne pouvaient rien ajouter à la connaissance, encore moins à la sagesse - pas plus qu'une pile de briques ne saurait rien ajouter à une cathedrale (6)".

Pendant cette période de morcellement, le sens de l'unité se ma-

nifestait d'une manière curieuse, sous-jacente en quelque sorte à ce pluralisme multitudinaire, notamment sous la forme d'un expansionisme impérialiste: chacune des branches du savoir prétendant, à tour de rôle, régenter, voire informer (au sens fort) les autres. La mécanique que l'on serait tenté de qualifier aujourd'hui de pré-scientifique, n'aspirait-elle pas à s'ériger en modèle de toute science? Kant n'a-t-il pas été influencé par Newton? La sociologie, cette "physique sociale", n'a-t-elle pas essayé de s'imposer aux autres branches du savoir? De notre temps même, ne subissons-nous pas l'impérialisme de la linguistique? Il est à observer du reste que de telles tentatives - qui ne durent qu'un temps - d'annexion sporadiques des différentes "disciplines" par l'une d'entre elles relèvent, si dire se peut, d'un impérialisme horizontal et laissent par conséquent intact le problème du rapport vertical entre les disciplines en question, d'une part, et d'autre part, la philosophie, la logique, la mathématique.

Retour vers l'unité du savoir?

Quoi qu'il en soit de ce problème redoutable que je n'ai même pas l'intention d'effleurer ici, ce qui importe c'est d'indiquer que nous paraissons entrer dans une phase nouvelle où la diversité se maintient, certes, mais où l'unité est à nouveau presentie, recherchée, affirmée - et ce par des procédés étrangers à l'impérialisme, bien que celui-ci ne s'efface pas complètement comme en témoigne cette profession de foi unitariste:

"La tendance de la pensée physique à devenir globale est accompagnée par la tendance complémentaire à se constituer comme pensée unitaire. Il est dans la nature de la pensée physique, on dirait, de former le projet audacieux de représenter toutes les propriétés de la matière (le processus de son évolution y compris) par la donnée d'un seul objet mathématique, qui serait (...) une section globale de l'espace fibré representant la totalité des possibles ... A la tendance de la pensée physique à construire une théorie globale unitaire de l'univers correspond, de la part de l'objet, l'existence d'un seul univers. L'affirmation qu'il y a un seul univers est un postulat de la pensée phy-

sique, exprimant, comme tout postulat, la propre nature de la pensée. Il implique, au niveau géométrique, l'hypothèse de connexion de l'espace ; au niveau dynamique, l'inexistance de systèmes fermés distincts de l'univers tout entier. Enfin, dans un sens plus général, un tel postulat implique qu'il n'y a pas de propriétés de la matière qui soient foncièrement indépendantes (7)".

Impérialisme de la physique? Davantage dans la terminologie et dans certaines formulations, semble-t-il, que dans la pensée de l'auteur, G.V. Henriques. Celui-ci en precise du reste lui-même la portée:

"Une théorie globale vraiment unitaire de l'univers contiendrait implicitement la réponse à tous les grands problèmes épistémologiques... Le sujet fait partie, par son organisme, du système physique global. L'objet, à son tour, n'existe pas indépendamment du sujet: autrement, il serait inconnaissable. Voici le paradoxe (purement apparent, sans doute) de la connaissance objective: celle-ci doit être une assimilation adéquate(c'est-à-dire: non déformante) de l'objet par le sujet; mais le sujet ne peut connaître l'objet qu'en agissant sur lui, c'est-à-dire en le transformant (8)".

Ce passage, à bien des égards remarquable et qui anticipe grandement sur ce qui doit suivre, révèle clairement qu'il ne s'agit plus de "physique", mais bien d'une recherche qui se situe aux limites de la philosophie, de l'épistémologie et de la méthodologie, et qui s'oriente vers la théorie générale des systèmes.

Méthodes particulières et science de la méthode

Mais il convient, après cette échappée, que l'on ne devra, que l'on ne pourra oublier, de revenir à notre propos.
Maintien de la diversité, recherche de l'unité, disais-je: observons en passant, nous aurons du reste l'occasion de le rappeler, qu'il s'agit de la devise même du fédéralisme. En ce qui concerne la tendance unitaire qui m'intéresse plus spécialement dans ce contexte, elle se manifeste de differentes manières:

- Par la multiplication de "sciences-charnières", telles la logique mathématique, la biochimie, la psycho-sociologie, la géophysique.

On peut observer ici, avec Heinrich Rombach, dont j'ai déjà cité un texte extrait de "Strukturontologie", que si l'accent était mis jadis sur la solidité des frontières entre différentes disciplines - "pour Kant, ce qui détermine le rang qu'occupe une science, c'est la manière décisive avec laquelle elle maintient ses frontières" (... wie entschieden sie ihre Grenzen einzuhalten vermag) - aujourd'hui, au contraire, "les problèmes féconds sont situés dans les zones frontalières et de transitions".

- Par la poussée de méthodes de formulation ou d' "explication" multivalentes (que l'on songe à la théorie des jeux, à la cybernétique, à l'informatique, etc.).

- Par une "aperception", encore vague et tâtonnante, de l'unité fondamentale du savoir, dont la nature - méthodologique? épistémologique? structurale? systématique? - reste encore à découvrir.

C'est cette "aperception" que paraissent exprimer, timidement, tant de textes émanant des savants eux-mêmes, comme celui dû à W. Heisenberg, dans lequel celui-ci montre que la science, après sa décomposition (Auflösung) en disciplines particulières, est parvenue à une phase où les différentes sciences en sont à rechercher entre elles une liaison (Verbindung) plus étroite. En vérité, il s'agit encore, dans l'esprit d'un grand physicien, de l'unité des sciences dites exactes, le titre allemand de l'ouvrage (publié en 1942) étant: "Die Einheit des Naturwissenschaftlichen Weltbildes". Mais ayant cité W. Heisenberg, Heinrich Rombach précise à son tour: "Après avoir élaboré longuement et d'une façon approfondie la différence méthodique et fondamentale (grundsätzlich) entre sciences de la nature et sciences de l'esprit, on tourne le regard, aujourd'hui, plutôt vers leur rapprochement (Zusammenhang) et leur unité essentielle (wesenmässige) (9)".

Toutes ces "aperceptions", j'ai essayé de les exprimer plus brutalement, au nom du fédéralisme conçu comme système, en affirmant que celui-ci, tout en restant favorable à la diversification des méthodes, se montre enclin à considerer cette diversification comme l'une des positions-limites, comme l'un des pôles du rapport dialectique entre l'un et le multiple. Ce qui est primordial, mais qui nous projette déjà dans

la dimension de l'ontique, c'est d'apercevoir, dans une prémonition, que l'un est aussi l'autre parce qu'il est lui-même diversifiant.

C'est pourquoi, tout en condamnant le monisme, tout en préconisant la spécification des méthodes, toujours plus poussée, plus diversifiée et plus fine, le fédéralisme - situé dans un "focus" systémique - ne saurait renoncer à ce que j'ai désigné par l'expression méthodologie générale du savoir, mais qu'on pourrait appeler aussi théorie générale des systèmes. Si une telle méthodologie n'existait pas de quelque façon, ne fût-ce que potentiellement, ne fût-ce que d'une manière toujours future, le savoir - sous la poussée de ce que je qualifierais, avec Marie Bunge, come le "separatisme" - se decomposerait au point de se nier lui-même et de devenir de la sorte, à la limite, proprement inconcevable. N'aurait-on pas le droit de poser, comme principe, que tout savoir au pluriel postule l'unité du savoir? N'en résultérait-il pas directement que, définie, comme la science intégrée des méthodes, la méthodologie, elle aussi, conjuguerait dialectiquement le singulier et le pluriel, l'un renvoyant nécessairement à l'autre. On a pu dire même que la méthodologie s'efforce "s'élaborer la méthode et non les méthodes ...". Toutefois, ne faut-il pas commencer, ne fût-ce qu'en raison de l'extraordinaire épanouissement des sciences par un inventaire des méthodes déjà élaborées? Or, comme l'observe Roland Caude (dans un ouvrage collectif intitulé "Méthodologie, Vers une science de l'action"), "un tel inventaire, en projetant la lumière sur la pluralité, doit sous-entendre une unité, qui sera peut-être realisée ...". En d'autres termes, utilisés dans le même ouvrage par Abraham Moles, rien ne s'oppose, semble-t-il, à ce que, "au-delà des méthodes particulières, il puisse exister une science des méthodes ...".

Introduction des modèles

Si une telle science, au singulier, est possible, il est à présumer qu'elle ne pourra s'édifier que par le recours à des modèles. Mais que signifie au juste ce vocable? Sans doute oscille-t-il, comme tant d'autres termes du même type, entre la raison et l'expérience, sans pouvoir se détacher ni de l'une ni de l'autre; on pourrait du reste

caractériser leur relation, avec plus de pertinence encore, par l'excellente formule que Jean Ladrière applique à la tension dialectique entre la règle et son interprétation: "chacun des aspects est en quelques sorte efficace per l' intermédiaire de l'autre".

En se tournant d'abord vers l'expérience, on peut concevoir le modèle "comme un schéma général permettant de rendre compte du plus grand nombre de phénomènes particuliers". En somme, il s'agirait, en première approximation, d'une abstraction commode s'inspirant d'une description aussi exacte que possible. Conception que l'on pourrait qualifier d'empiriste dans la mesure où "elle suppose le modèle formé, par abstraction, à partir de l'observation ou de l'expérience".

Eléments de définition empruntés au volume "La Philosophie" de la collection des Dictionnaires du savoir moderne, et dont je me suis déjà servi dans "De la méthodologie à la dialectique". Qu'il me suffise de rappeler ici, bien que cela puisse paraître anecdotique et sans grand intérêt, que c'est l'utilisation d'une telle méthode "empiriste" qui m'a inspiré le premier modèle qu'il m'ait été donné d'établir, celui du fédéralisme: [i] autonomie, [ii] coopération (ou solidarité), [iii] subsidiarité (ou exacte adéquation), [iv] participation. C'est précisément à partir d'une expérience historique et sociologique, celle principalement de la révolution américaine, que ce "schéma général" a pu être légitimement dégagé.

Certes, je ne l'ignore point, une abstraction à base empirique se prête à des interprétations dissemblables. Rien n'empêche de pousser le modèle du fédéralisme à une construction à cinq termes en y incluant ce que d'aucuns ont considéré comme un principe aussi important que les quatre: la garantie. Ou de ramener le dit modèle à trois, voire à deux termes, la dichotomie: autonomie - participation, paraissant suffisante à générer dialectiquement les autres principes, réduits au rôle de moyens.

Si j'ai maintenu malgré tout mon modèle quaternaire, abstrait de l'empirie, ce n'est plus, il faut le reconnaître, pour des raisons empirique seulement. Dans l'établissement de modèles en général, il y a aussi une polarisation ou, comme le dit W. Ross Ashby, deux orientations principales:

"... L'une, déjà bien développée par von Bertalanffy et ses collaborateurs, prend le monde tel qu'on le trouve, examine les différents systèmes qui s'y produisent (...) et ensuite formule des propositions (draw up statements) concernant les régularités dont la continuité a pu être constatée (the regularities that have been observed to hold). Méthode essentiellement empirique ... La seconde méthode part (is to start) de l'autre bout. Au lieu d'étudier d'abord un système, ensuite un deuxième, puis un troisième, et ainsi de suite, elle va à l'autre extrême, considère l'ensemble de tous les systèmes concevables et puis réduit cet ensemble à une taille plus raisonable".

Cette seconde méthode reproduit, confrontée à la première, la figure qui nous devient familière d'une tension dynamique entre deux positions-limites dont il est à constater, une fois de plus, qu'aucune ne peut être définitivement atteinte ni définitivement éliminée. Toutefois, la science contemporaine se montre encline à donner la préférence à la seconde méthode, au second type de modèles, et ce pour des raisons dont, pour commencer, je voudrais emprunter l'exposé, un peu long, à un physicien.

Modèles "axiomatisés"

La théorie physique opère avec des systèmes de propositions liant entre eux des concepts, c'est-à-dire des notions portées au niveau d' "abstraction" requis. Des règles rigoureuses permettent à la théorie de "progresser" en transformant ces propositions en d'autres. Ce qui n'est possible que si les concepts sont pour ainsi dire définis par une axiomatique, c'est-à-dire par un réseau de relations "sans aucune référence à des notions extérieures au système d'axiomes (sinon à d'autres systèmes déjà axiomatisés). Ceci nonobstant le fait que nous utilisons en général pour nommer ces notions des mots empruntés au langage courant où ils désignent des objets de l'expérience".

Et F. Halbwache, puisque c'est de lui qu'il s'agit, de mettre les points sur les i en précisant qu'un tel modèle est "de même nature qu'une théorie mathématique. Il entraîne le même degré de rigueur et de certitude Nous sommes loin, très loin du modèle qualifié d'empirique puisque l'auteur n'hésite point à souligner, en poussant à la limite, que "la signification

intrinsèque des concepts et la vérité des propositions ne dépendent en rien de l'expérience (10)"!
S'agissant d'un modèle de même nature "qu'une théorie mathématique", ne faudrait-il pas tendre vers un maximum "de rigueur et de certitude", c'est-à-dire vers une certaine formalisation mathématique. Déjà dans "De la méthodologie ...", j'ai tenu, à ce propos, à repousser l'accusation de sacrifier à l'on ne sait quel panmathématisme. Autant et plus que quiconque, je suis convaincu que, dans de très nombreux domains sinon dans tous, les définitions de type mathématique sont sans doute nécessaires mais non suffisantes.
Rigoureuses et certaines, elles ne sont pas toujours fécondes. D'une porté immense (c'est-à-dire sans limites), elles son paradoxalement limitées. On pourrait rappeler à ce propos la remarque formulée, d'une manière naïve, par l'un des pères de la théorie générale des systèmes:

"Tout en comprenant et en soulignant le rôle des mathématiques (...) l'auteur ne voit pas la possibilité d'écarter les aspects proprement humanistes, à moins de limiter la théorie générale à une vision restreinte et fragmentaire" (Bertalanffy, (61 ii), p. 38).

Néanmoins, si la mathématique ne peut prétendre nous conduire, pour ainsi dire toute seule, au terme de notre cheminement, elle trace l'unique ligne de départ qui soit "sûre", en même temps qu'elle permet de construire, d'une manière toujours plus étendue et plus extensive, un système de référence, voire de contrôle (au sens actif). A telle enseigne que nous avons sans nul doute le droit et le devoir de généraliser à tous les concepts ce que Pierre Delattre dit de celui de structure:

"Le mot structure, bien que très fréquemment utilisé dans des domaines divers, est entaché d'un vice fondamental qui rend son emploi délicat dans le cadre d'une théorie rigoureuse. Les différentes définitions qui en ont été données sont en effet trop imprécises pour permettre une formalisation (...); elles se prêtent à des acceptions variées, entraînant (...) des confusions et des ambiguités ... La seule exception à cet état de fait concerne la définition mathématique de la structure, mais ce concept précis ne peut malheureusement pas être utilisé tel quel dans tous les cas, et dans tous les aspects de l'étude d'un système ..." (30 ii).

En outre, il convient de tenir compte d'un fait important que relèvent dans "Systems Engineering", A.D. Hall et R.E. Eagen, en soulignant qu'un modèle mathématique, "même simplificateur et relativement inadapté (inaccurate), peut parfois susciter des clarifications surprenantes" (cité d'après (20), déjà mentionné dans la note (6)). Sans oublier un fait plus important encore que négligent les adversaires du prétendu "panmathématisme", et que met notamment en lumière dans "Trends in General Systems Theory" (61 ii), George J. Klir, en insistant sur le rôle décisif des développements nouveaux de la mathématique elle-même: "... à la fois modification (extension, généralisation) des concepts mathématiques existants (...) et création des concepts, principes, instruments nouveaux. Il s'agit, ajoute l'auteur, d'une tendance marquante de la théorie générale des systèmes. Nous sommes désormais en présence, pour paraphraser un commentateur allemand (il s'agit de H. Behnke; cf. Gert König dans l'ouvrage collectif (52) publié par Alwin Diemer), de véritables "conglomérats", hautement complexes, d'un certain nombre de "types de base" (Grundtypen) des structures topologiques, algébriques et d'ordre, "qui constituent les véritables objets de la mathématique en tant que science - et non plus, comme jadis, l'espace et le temps".

Ni panmathématisme, ni scientisme

C'est dans cet esprit, et dans cet esprit seulement, que j'ai fait mienne une tentive de définition suggérée par Roger Martin (11). Mais rien n'empêche de se servir de la schématisation du concept central de la théorie des modèles, élaborée par Tarski et résumée (12) par Rolando Garcia:

"Soit un ensemble d'énoncés (X) d'un langage donné (L). Soit F une formule (un énoncé) quelconque en X. Une classe M d'objets est appelée un modèle de X si chaque formule F en X est vraie en M. Si X est l'ensemble d'axiomes d'une théorie logico-mathématique, alors M est un modèle de cette théorie".

Qui ne voit qu'entre ce modèle M et celui qualifié antérieurement d'empirique - factuel serait du reste plus pertinant - une tension dialectique s'établit qui reproduit la figure des positions-limites?

Entre ces deux positions qui tendent à coïncider respectivement avec l'a priori et l'a posteriori quel paradigme construire qui, pour une part (indéterminée) ressortisse à l'un comme à l'autre? Malgré l'intransigeance superbe de l'attitude logico-mathématique, on constate en effet qu'elle ne saurait aboutir à l'élimination de l'attitude opposée. R. Garcia lui-même, tout en se réclamant de Tarski, ne propose-t-il pas, du modèle physique, une définition beaucoup plus longue, plus complexe et moins "pure":

" ... Un modèle physique est un système de relations avec, en plus, une interprétation précise des termes qui y interviennent. Dans le modèle, il y a des fonctions qui relient des variables par le moyen d'opérations logico-mathématiques, et dans lesquelles interviennent certaines constantes; il y a, aussi, des schèmes déductifs qui nous permettent de transformer les fonctions, de les relier entre elles et de calculer leurs valeurs. Aux constantes et variables dans le modèle, correspondent, dans le monde physique, les propriétés des objets; aux fonctions, correspondent les liaisons "réelles" entre les propriétés; et aux schèmes déductifs, correspondent des relations causales (13)".

Il suffit de relire attentivement la seconde partie de ce texte pour se rendre compte du fait que la nécessaire formalisation logico-mathématique ne constitue d'aucune manière la revanche de ceux dont Charles Péguy s'est moqué en les traitant de savants sociomathématiciens. Sans ironie aucune, il n'est pas interdit de signaler en passant que Margaret Masterman, commentateur sympathique, elle-même favorable à l'utilisation du terme de paradigme par Thomas S. Kuhn - terme qui devrait être "sérié" avec d'autres, comme modèle, schème, pattern, maquette, spécimen, esquisse, loi, règle, norme, fonction, type, archétype, catégorie, forme, figure, etc., sans oublier moule, matrice structure, totalité et système - a découvert que, dans la première édition de son livre "The Structure of Scientific Revolutions", Kuhn emplie ce vocable, pourtant fondamental pour lui, dans vingt-deux sens differents!

Néanmoins, il convient de reconnaître que l'état présent de la science incite à mettre l'accent sur la modélisation du second type. Ce n'est pas seulement une question d'engouement intellectuel. Il n'est point dou-

teux que l'utilisation de la méthode dite axiomatique, caractéristique de la science contemporaine, contribue à dissiper les équivoques, et ce non seulement au départ, comme déjà indiqué, mais aussi en cours de route, voire à l'arrivée. Je n'en veux pour preuve ou, plus exactement, pour illustration, qu'un exemple emprunté au mathématicien Anatol Rapoport. Celui-ci observe que les concepts, familiers à Bertalanffy, de système ouvert, d'équifinalité, d'homeostasis, risquent, en se combinant, de glisser vers une certaine téléologie, au sens critiquable du terme. En revanche, le traitement mathématique permet de lever toute ambiguité. Ainsi, un système ouvert peut être identifié à un système clos, au contraire, avec un système homogène ("with a constraint representing the conservation of mass"). Dès lors, l'équifinalité, par exemple, apparaît, non plus comme une "spéculation" quelque peu suspecte, mais comme "a mathematical consequence" de l'opposition entre analytique et synthétique, fragmentaire et global, éclairée par l'opposition entre équation différentielles et équations intégrales (cf. (61 ii) pp. 43 et 53 s.).

L'évolution de la science contemporaine nous fournit donc une indication, une orientation précieuse. Entendons-nous: de même que j'ai repoussé tout soupçon de je ne sais quel panmathématisme, de même je ne me crois nullement scientiste parce que je me réfère à la science.

Le scientisme se manifeste par le transfert pur et simple des résultats spécifiques d'une des branches du savoir dans une autre, ou bien, d'une manière plus criticable encore, dans ce qu'on pourrait désigner comme l' "ensemble" (coordination, convergence, synthèse) de ces branches. Un tel transfert ou, comme je serais tenté de le dire, une telle dé-position est intrinsèquement illégitime, même au regard de la branche de la science que l'on prétend avantager en lui faisant subir une sorte d' "extrapolation".

Aussi bien n'est-ce point de cela qu'il s'agit: la science en tant que telle constitue l'une des activités typiques, privilégiées, essentielles de l'esprit humain. En tant que telle, elle est l'une des expressions majeures, au sens le plus fort, de cet esprit. Elle bénéficie, en outre, de notre temps, d'une valorisation remarquable.

Il n'y a donc rien d'anormal ou d'illégitime à vouloir fonder sur la science l'édifice de la méthodologie générale - ce qui n'implique aucunement qu'un édifice doive se réduire à ses fondements.

Rappel du modèle universel

En soumettant la démarche de la science contemporaine dans son ensemble à un traitement systématique - description, analyse, synthèse, pro-jet, - je suis parvenu à construire ce que j'appelle le modèle universel. Celui, également quaternaire, du fédéralisme m'y a-t-il de quelque façon prédisposé. La question m'intéresse à titre personnel, mais tout compte fait peut être laissée sans réponse, car le modèle universel se défend fort bien lui-même. En l'ayant développé dans "De la méthodologie ...", je ne reprendrai ici que les éléments sans lesquels la compréhension de ce qui doit suivre deviendrait impossible.

Le modèle universel a été "berbalisé" comme suit:

[i] Processions d'éléments premiers;
[ii] Procédés de traitement;
[iii] Procédure de construction;
[IV] Processus de dé-rivation.

Présentation qui suscite, dès le départ, quantité de questions: pourquoi les vocables employés et pas d'autres? - que signifie la subdivision quadripartie? - s'agit-il d'articulations, de facteurs, de niveaux, de dimensions? - à quoi peut servir un tel "pattern". - et j'en passe.

Avant d'essayer de répondre, même très imparfaitement, à une partie tout su moins des questions, des doutes, des critiques légitimes, il convient peut-être de préciser quelque peu chacune des "composantes" énumérées.

Ligne de départ

(i) Quelles que soient les hypothèses métaphysiques que l'on puisse formuler sur leur nature, tout savoir implique des données initiales.

L'expression doit être maniée avec précaution. Il s'agit d' "éléments" premiers, de points de départ, de ce qui se trouve à la base, de "matériaux" d'origine, de ce qui permet de "commencer". Rien de commun, on le voit, avec les données immédiates d'Henri Bergson. Rien, non plus, qui commande l'adhésion à un réalisme naïf: comme le dit Walter Buckley, "tout appel positiviste aux données immédiates de l'expérience "prétend ignorer que celle-ci est sous-tendue par "le procès constructif de perception et de conception" (in 61 ii, p. 199). En outre, il n'est pas nécessaire que les éléments de départ soient données, au sens strict, ils peuvent être choisis, proposés, arrêtés, comme le sont, en mathématique, les axiomes et les algorithmes. Toutefois, cette position dont la formulation évoque le principe de tolérance, si elle peut être interprétée ultérieurement à la lumière du structuralisme constructiviste et de la liberté créatrice, ne doit pas être traitée comme une adhésion au positivisme logique.

En vérité, il s'agit presque d' une constatation qui relève du bon sens: à la source, toute tentative de savoir, toute procession s'appuie sur "quelque chose". Affirmation qui peut paraître vague, à juste titre, mais pas plus vague en somme que celles qui vont suivre, concernant les trois autres "composantes" du model universel: les unes et les autres ne peuvent "se préciser", "s'éclairer", s' enrichir qu'au cours d'un procès (au sens allemand ou anglais) qui n'est autre que dialectique; procès "d'assimilation réciproque", qui, s'il ne consiste pas à reduire le supérieur à l'inférieur (...) ne procède pas non plus selon la réduction inverse, du moins dans le sens d'un "simple emboîtement extensionnel", mais revient à intégrer les structures antérieures dans les suivantes, lesquelles cependant partiellement issues des précédentes".
Ce commentaire des idées d'Henriques par Piaget ne devrait jamais être perdu de vue au cours des développements qui suivent (14). Pour revenir quelque peu en arrière, il convient de préciser, afin d'éviter un malentendu possible, qu'en utilisant l'expression: toute procession s'appuie sur quelque chose, je n'incline nullement, faut-il le souligner encore, vers quelque "chosisme". A titre d'orientation, on pourrait citer Jay W. Forrester qui, en parlant de la planification, précise: "on ne procède pas (...) à la planification à long terme sur des objets inertes". La planification apparaît donc comme un ensemble d'activités que l'on exerce sur

"un système à interaction multiples, système dont ces activités sont d'ailleurs les éléments (15)". Ainsi, rien ne s'oppose a priori à ce que les données premières soient en fait des "opérations" ou des"activités".

Epuration conceptuelle

(ii) Les procédés de traitement sont nécessaires si la ligne de départ ne doit pas rester celle de l'immobilisme. L'effort du savoir implique une distantiation par rapport aux éléments premiers, quels qu'ils soient: ce serait les priver de toute fécondité que de prétendre les garder "tels que", on ne les conserve qu'en les dynamisant, c'est-à-dire, de quelque façon, en les "modifiant". C'est pourquoi, soit dit en passant, toute réduction à l'identité (Emile Meyerson), toute acceptation de la tautologie comme critère absolu de la connaissance scientifique, même dans la ligne de la déduction' voire dans le seul domaine logico-mathématique, me paraît, comme on dit, une vue de l'esprit, mais d'un esprit qui se rend volontairement aveugle.

Les données initiales pouvant être diverses - que l'on songe à la différence entre la "matière première" de l'expérience quotidienne, désignée d'abord comme le syncret (dans ma "Dialectique du déchaînement"), ensuite comme le secret ou le subcret (16), et aux éléments dont dispose, au départ, une théorie physique - les procédés de traitement ne sauraient être toujours et partout les mêmes. Pourtant, ils ont tous quelque chose en commun: ils permettent de passer des prénotions et des notions aux concepts qui constituent des instruments d'analyse, le dis-jonction (intrasériation, intersériation), de mise en relation. Conceptualisation qui contribue à la constitution de l'abstrait, même si, au point de départ, on place un fondement axiomatique qui, à première vue, paraît "de l'abstrait pur". Il y a là un problème qui mériterait d'être traité en lui-même. Faute de pouvoir le faire, je me contente d'observer que, dans les années trente, sous l'influence du vaillant noyau bourbakiste, je penchais, avec quelques réserves, vers la théorie de l'abstrait pur constitué en quelque sorte dès le point de départ, par ce que nous appelions l'acte d'exclusion (17). Tout compte fait, et pour des raisons multiples, je n'ai pas tardé à corriger ou tout au moins à nuancer cette manière de voir. Mon point de vue, aujourd'hui, se rapprocherait de celui de Jean Ladrière sur la formalisation:

"L'intelligibilité est (...) dans le sens de la formalisation croissante. Cette expression doit être entendue au sens actif. On ne se trouve jamais en présence d'une forme définitivemnt établie que l'on pourrait contempler; on se trouve à tout instant engagé dans un mouvement de montée vers la forme... Tout niveau de formalisation demande à être thématisé dans un niveau ultérieur, plus formel encore. Il n'y a pas de limite dans l'abstraction de la forme (...), appel vers une épuration de plus en plus parfaite. La montée vers la forme est donc sans terme assignable (...), horizon (qui) n'est pas donné à l'avance et ne pourrait être thématisé... L'horizon de la forme pure n'est donc rien d'autre que la transgression interne que s'effectue dans toutes les formes (données) et qui constitue le véritable moteur de la recherche ... (18)".

Excellente formulation qui mutatis mutandis peut être appliquée sans aucune difficulté à notre problème. Ne pourrait-on pas dire qu'il n'y a pas d'abstrait pur,mais bien un effort d'épuration, de plus en plus exigeant? Et que les procédés de traitement peuvent être en quelque sort "définis" comme des essais de transgression, à la fois interne et externe tendant à passer de la description à l'élucidation, du signal au signe, de la phénoménoscopie à l'aporétique.

Combinatoire

(iii) Les procédures d'élaboration et de construction ne sont possibles que grâce à l'abstraction qui, contrairement à l'usage souvent péjoratif dont pâtit ce terme - "ce ne sont que des abstractions!" - constitue le privilège insigne de l'homme. C'est grâce à l'abstrait seulement que ces procédures - per l'axiomatisation, analyse, interprétation, théorétisation, formalisation - permettent d'édifier des "systèmes".
Peu importe du reste le terme: système, théorie, explication, combinatoire ou tectonique; ce qui importe, c'est de reconnaître que ce sont déjà, un peu par anticipation, des constructions pluri-dimensionnelles qui s'efforcent de répondre aux critères, changeants sans doute mais toujours plus serrés, de coordination, de mise en ordre, d' "assimilation réciproque" (Henrique), de mise en perspective, de com-préhension. Chaque théorie constitue, si dire se peut, un espace nouveau, plus vaste, plus complexe, plus diversifié,

plus structuré; espace de configuration qu'il faut commencer par "débarasser complètement de l'idéal du réalisme naïf, visant à chercher la théorie vraie, formée de concepts et de relations qui soient des copies exactes de la réalité". En effet, "d'une part les concepts de la théorie différent irréductiblement par nature des objets de la réalité (de la réalité secrète ou sub-crète, serais-je tenté d'ajouter - A.M.). D'autre part et surtout, le rapport d'adéquation (morphisme) entre modèle et situation est un rapport en transformation perpétuel, jamais exact, jamais définitif, mais en constant progrès ..." (F. Halbwachs). En considérant attentivement cette troisième "composante" du modèle universel, on est amené à reconnaître qu'elle constitue comme une tentative de synthèse entre la phénoménoscopie et l'aporétique, entre la description et l'analyse, entre le secret, c'est-à-dire le concret originel, et le discret : d'où le terme de syncret qui intervient maintenant à ce niveau.

Figure et abîme

(iv) La quatrième "composante" est, sans contexte, la plus difficile à dé-finir parce que, de par sa nature même, elle apparaît comme un défi à tout ce qui est "fini", comme une "investigation of the unknown" (Robert A. Orchard). Pour essayer d'indiquer de quoi il s'agit, il convient de noter que la démarche scientifique ne s'épuise point dans ce mouvement qui, par la conceptualisation, conduit de la ligne de départ à la constitution de l'espace théorique. Au délà de cet espace à trois "dimensions" s'ouvre, pour employer une métaphore banale, l'espace à dimensions multiples: comme la métalangue au delà de la langue, la méta-théorie ou épi-théorie se profile au delà de toute tectonique. Toutes les branches du savoir manifestent, surtout de notre temps, cette tendance au dépassement, de sorte qu'il est permis de s'étonner qu'elle n'ait pas retenu davantage l'attention des épistémologues.

Au delà de toute construction achevée, se déploie ainsi la perspective d'approfondissement, d'expansion, de découverte, d'invention, de création, à moins que ce ne soit la perspective de rétro-duction, d'application ou, comme dit Piaget, d'attribution.

Certes, il ne s'agit point, dans le cas de cette quatrième "composante", de se résigner à un pêle-mêle de notions impures et vagues; il convient de procéder, au contraire, à un effort de purification intransigeante. A condition, toutefois, de ne pas méconnaître la portée d'une observation de Walter Buckley: "la purification est nécessaire, certes, pour écarter la confusion et l'erreur (...), mais la question principale reste de savoir comment éviter d'éliminer en même temps l'information utile, voir le sens" (in (61) ii, p. 199).

Quoi qu'il en soit, c'est en raison même de cette large ouverture de l'éventail des possibles, de cette diversité d'orientations et d'interprétations (au sens fort), que j'ai proposé, pour en signifier l'ambiguité, le terme, à première vue étrange, de dé-rivation. Par son caractère polysémique, il contribue, sinon à empêcher, tout au moins à retarder toute tentative de réduction ou de simplification abusives. Dans "De la méthodologie ...", j'ai rappelé quelques emplois de ce terme qui peuvent aider à l'enrichir: dérivabilité des jugements, dérivée en mathématique, dérivation - régressive ou progressive - des mots, mais aussi dérive d'un navire, l'action de faire dériver le cours d'un fleuve - c'est-à-dire le détourner dans une nouvelle direction - ou encore, de faire dériveter, au sens de défaire ce qui était rivé, de libérer ce qui était fixé, id est de déchaîner. Depuis, j'ai noté que Jean Ladrière, que j'aurai encore à mettre à contribution, parle des règles de la "déduction naturelle" qui n'ont de pouvoir explicatif que dans la mesure où elles "renvoient à des relations de dérivabilité". En l'occurence, je serais tenté, plutôt que de relations, de parler de mises en co-respondance.

La quatrième "composante" du modèle universel se présente, de prime abord, comme plus différents des trois autres qu'elles ne le sont entre elles, mais pour la raison déjà indiquée, rien n'est plus difficile que de "préciser" - ce terme étant pour le coup contestable - la nature de cette différence. A titre d'ana-logie, l'on peut songer, par parenthèse, aux rapports que les principe suprême du fédéralisme, la participation, entretient avec les trois autres.

Quoi qu'il en soit, en se plaçant à ce niveau là en déborde sans doute la méthodologie, voire l'épistémologie, non pas, comme on le dit

quelquefois, pour déboucher sur l'ontique - comme si l'être pouvait être "bouché" - mais pour le viser, plus ou moins expressément, "en tant qu'être", c'est-à-dire dans son mystère. Du [i] secret au [iv] mystère, le chemin à parcourir est celui de la rationalisation; Jean Ladrière le définit à sa manière que j'ai vraiment appréciée:

"Ce qui est éclairant c'est la dynamique interne de la forme, son auto-monstration, dans le double aspect de la manifestation (...) finie et du surplus de sens qui appelle comme un exhaussement indéfini du plan formel. Toute forme finie enveloppe la possibilité de son approfondissement, elle inclut un abîme. En tant que finie, elle est figure; en tant que non fermée sur soi, elle est infigurable. Le rapport de la figure à l'abîme est l'essence même de la forme; c'est par lui qu'il lui advient d'être à la fois source d'intélligibilité, exigence innovatrice et puissance, invinciblement énigmatique (19)."

Si j'avais à paraphraser ce texte, je proposerais sans doute que le mystère substitué à l'énigme, celui-ci étant plus proche du problème que de l'abîme, car ce dernier ne se laisse pas expliciter ni a fortiori élucider. Il n'en reste pas moins vrai que le texte précité me paraît amorcer l'essor final que, dans une perspective à la fois plus large et plus radicale, j'ai essayé de décrire comme suit:

"... Trans-unité du concret et de l'agir, dans leur commun accomplissement vers la perfection, à jamais transcendante. Au fil de cet accomplissement, l'esprit se révèle, paradoxalement, à la fois le couronnement, temporel et transtemporel, et la source, toujours jallissante ... Une chose est sûre: l'acte ne se laisse couler dans aucun moule, ni enfermer dans aucune formule, ni réduire à aucun modèle ... L'incertitude suprême (...) ne saurait jamais être dissipée" ("De la méthodologie ...")

Pour ne pas conclure ce paragraphe important en me citant moi-même, je me permettrai de revenir à une perspective plus modeste, moins "philosophique" peut-être, en rappelant que la théorie de la vérité de Tarski à laquelle il a été déjà fait allusion, "montre que la vérité d'un énoncé d'une théorie ne peut pas être prouvée. Ce qui, comme l'a indiqué Popper, a une bien étrange conséquence, puisqu'il s'ensuit que même si nous parvenions jamais à la "description finale" de la Nature, nous ne pourrions pas la prouver! (20)

Formulation naïve, sans doute, voire confuse, mais qui mérite réflexion. Ne prépare-t-elle pas, de très loin encore, l'affrontement de la figure et de l'abîme?

Niveaux

Dans les pages qui précèdent, je me suis forcé, en parlant de "composantes" du modèle, à utiliser un langage neutre et prudent. Néanmoins, différentes citations ont incité déjà à confronter, par exemple, des "étapes" inférieures et supérieures, et même le mot de niveau n'a pu être complètement évité. Il s'agit donc de conceptualiser ce vocable, sans quoi l'on n'a pas le droit de l'introduire subrepticement.

Pour commencer, on peut observer que le terme en question peut être neutralisé par rapport aux fameuses composantes, c'est-à-dire être employé indistinctement à propos de chacune d'entre elles: on parlerait alors du premier niveau, du deuxième niveau, etc. Mais rien n'interdit d'envisager une différenciation, une spécification de la terminologie; comme, par exemple:

[i] palier (ou sub-strat), [ii] échelon (ou inter-strat), [iii] étagement (ou super-strat), [iv] dimension (ou trans-strat).

Une telle différenciation favoriserait peut-être une plus grande finesse d'analyse; elle permettrait par exemple de mettre mieux en lumière l'originalité du quatrième niveau. En effet, le vocable de dimensiona un sens beaucoup plus général que dans la conception physique du passé: longueur, largeur, hauteur ... Comme l'a rappelé, entre autres, Abraham Moles, ce vocable constitue "pour les mathématiciens qui n'ont jamais été gênés pour raisonner avec des espaces à un grand nombre de dimension, (...) un terme (...), permettant une mise en ordre". En l'occurrance, des expressions come mise en oeuvre, mise en co-respondance, mise en prospective, me paraîtraient du reste plus idoines.

Quoi qu'il en soit, le concept de dimension, pris en lui-même, poserait un problème de formalisation singulièrement ardu. En paraphrasant une fois de plus Heinrich Rombach - en raison notamment d'une inversion partielle qu'il effectue entre les termes de système et de structure - on pourrait dire que tout système "authentique" déploie une dimension dans laquelle il est signifiant. Une telle dimension représente l'ensemble des "échelles" d'après lesquelles un système régule et légitime son développement.

Il importe de comprendre que, "fixée" de la sorte, la dimension est l'horizon, propre à chaque système, qui rend possibles les comparaisons, grâce auxquelles tout système se confronte avec ses exigences et ses possibilités propres. Tout autre horizon reste extrinsèque, ce qui permet de mettre sa légitimité en doute. Si un horizon extérieur doit trouver sa justification, il faut alors que sa légitimation s'accomplisse à l'horizon de l'autonomie, c'est-à-dire en tant qu'articulation de ce qu'on pourrait appeler l'horizon "de soi-même". C'est cet horizon-là qui s'appelle dimension. Tous les horizons doivent être ramenés, en fin de compte, à des horizons "de soi-même".

Mais cette brève échappée vers l'ontologie de l'autonomie dont l'importance, pour le fédéralisme, n'a pas besoin d'être soulignée, nous a écarté de notre propos. Au point où nous en sommes, et quels que puissent être les avantages d'une différenciation terminologique comme celle esquissé plus haut, il est sans doute plus prudent de revenir au terme général de niveau qui, à lui tout seul, suscite suffisamment de problèmes.

Tentative de formalisation

Comment essayer de le définir, en vérité? On pourrait peut-être le conceptualiser à partir, d'une part, de l'expérience quotidienne, d'autre part, des différentes branches du savoir scientifique (physique, chimie, biologie, etc.) où il est utilisé. Il s'agirait d'un travail intéressant, sans nul doute, mais qui nous entraînerait trop loin.

Tout compte fait, il est préférable de prendre directement appui, pour démarrer, sur une tentative de formalisation qui a le mérite d'exister.

N, dirions-nous, est une structure de niveau si - et seulement si - il est un "couple" $N = \langle E, H \rangle$, E étant une "famille" d'ensembles de systèmes individuels, B une relation binaire, telles que:

$\boxed{N_1}$ Chaque membre de E est un ensemble de systèmes qui, à certains égards, sont "équivalents", autrement dit chaque élément de la famille E est une classe naturelle, une classe d'équivalence de systèmes partageant leurs propriétés et leurs lois fondamentales.

$\boxed{N_2}$ B est une relation reflexive et transitive "un - plusieurs" en E.

A ces deux "déterminations" qui ne sont pas d'un abord facile, Mario Bunge en a ajouté une troisième qui risque de laisser quelque peu perplexe, notamment en raison d'une traduction hésitante:

$\boxed{N_3}$ B représente (reflète, ou mieux, réfléchit) l'émergence ou l'accession à l'être, dans un procès (process), de la nouveauté de systèmes qualitativement nouveaux.

Il y aurait sans doute à s'interroger sur le sens et sur la porté de $\boxed{N_1}$ et de $\boxed{N_2}$, davantage encore de $\boxed{N_3}$. Mais venons-en plutôt, afin d'avancer, à la définition suivante:

Un ensemble de systèmes individuels est (ou constitue) un niveau si - et seulement si - il est un membre de la famille E de la structure de niveau N (c'est-à-dire si les trois conditions ci-dessus sont remplies).

Il ne semble pas, de prime abord, que ces formules se prêtent à une formalisation plus poussée, encore moins à une mathématisation, car de l'aveu même de Mario Munge, elles recèlent des "éléments" (ou clauses) sémantiques, et non point seulement algébriques.

Est-ce une raison pour en sous-estimer l'intérêt?
Comme le rappelle opportunément un professeur de science politique du M.I.T., "les théories scientifiques ne sont, après tout, que des ensembles de symboles, que ceux-ci apparaissent sous une forme sémantique, graphique ou mathématique". Or, ce qui donne à penser, un ordinateur est capable de décoder une expression symbolique, même non mathématisable, si elle "ne comporte aucune ambiguïté (Ithiel de Sola Pool).

Hiérarchies

Mesurons la portée de cettte observation, mais contentons-nous d'admettre, pour le moment, que les formules en cause peuvent aider tout au moins à pré-formaliser la problématique des niveaux. Après tout, comme l'observe (non sans une certaine affectation de naïveté) l'un des spécialistes de la "Polyphonic General Systems Theory", George J. Klir, "le pouvoir des langues naturelles d'exprimer dans une forme simple les relations complexes, est pleinement satisfaisant dans bien des cas, et

paraît être prometteur"!

Mais aussitôt une question se pose que j'avais découverte dans "De la Méthodologie ..." par un tout autre biais, celui de la hiérarchie des normes: entre des niveaux ainsi pré-formalisés, existe-t-il des rapports de caractère hiérarchique? Et que signifie du reste ce dernier terme?

Continuons à nous en tenir, en obéissant à la même inspiration, à la perspective de l'analyse et de la construction asystématiques:

H est une hiérarchie si - et seulement si - il existe un rapport "triple" H =(E, b, D), où E est un ensemble non vide, b un élément distinct de E, et D une relation binaire telle que, notamment:

H_4 | D est asymétrique et transitif;

H_5 | D représente (reflète ou, mieux réflechit) la "domination du pouvoir".

Il paraît difficile de rejeter purement et simplement un concept de hiérarchie ainsi pré-formalisé.
Peut-on prétendre pour autant qu'il soit déjà opératoire, voir opérationnel? L'introduction du terme "domination" ne contribue-t-elle pas à créer une certaine ambiguïté ou, en tout cas, à susciter un problème supplémentaire?

A cette étape de la recherche méthodologique, deux observations d'inégale importance paraissent devoir nous guider.

La première concerne l'existence, à côté de rapports de type "symétrique": A influence B, B influence A, d'un autre type de rapports, dit asymétrique: A influence B, B influence C (cf. ci dessus, H_4).

La deuxième observation, beaucoup plus importante à mes yeux, vise la possibilité de substituer, tout au moins partiellement, à ce graphe qu'est l'arbre dont le rôle a été exclusif dans le champ du savoir scientifique, d'un autre graphe, d'une plus grande richesse potentielle: le traillis.

Pour un "pluralisme intégré"

Afin de ne pas me répéter exagérément, je me contente, à ce propos, de renvoyer aux pages 95-96 de mon ouvrage sur la méthodologie. Qu'il me soit permis simplement de rappeler ici la satisfaction et le réconfort intellectuels que j'ai éprouvé en découvrant qu'un penseur d'inspiration marxiste, Henri Lefebvre, par un cheminement qui paraissait ne rien devoir au fédéralisme, aboutissait à une thématisation et à des thèses qui

tendaient à se confondre avec les miennes. Qu'une série de recherches, allant de la logique algébrique à l'étude de l' "espace social", permettent d'affirmer, aujourd'hui, la validité et la valeur de vérité plus hautes du treillis par rapport à l'arbre, me paraît un fait capital, car "sur un arbre, le trajet d'un point à un autre est obligé". D'où la prétention de pouvoir procéder à une mise en ordre totale; d'où le règne de la contrainte, de la hiérarchie univoque, bref du monisme. Traduit en termes socio-politiques, cet état de choses confirme la géniale prémonition de Proudhon: oui, la synthèse est gouvernementale!

A l'ordre "hiérarchique-bureaucratique" de l'arbre, le treillis permet de substituer le sain pluralisme fédéraliste; aux structures rigides, de type "étatique", des structures pour ainsi dire "déchaînées", rigoureuses certes mais souples, telles les lattices. Ce qui doit nous inciter à revenir à la perspective proprement systémique, en concentrant une attention critique sur les trois autres "déterminations" du rapport H = (E, b, D), laissées précédemment de côté:

H_1 E a un seul point originel, à savoir b; ce qui signifie (ou devrait signifier) que H comporte un et seulement un "supreme commander".

H_2 b se présente dans une relation de pouvoir à D, par rapport à chaque autre membre de E; se qui signifie (ou devrait signifier) qu'un élément quelconque, aussi bas qu'il ne se situe dans la hiérarchie, reste sous le "commandement" de l'élément originel.

H_3 Tout élément y de E, à l'exception de b, suppose qu'il existe un autre élément x de E, tel que Dxy; ce qui signifie (ou devrait signifier) que tout élément, tout membre de E n'a qu'un seul "patron"(boss).

D'une certaine manière, ce trois conditions n'en font qu'une, car toutes les trois paraissent refléter l'idéal moniste dont il a été question ci-dessus, et qui culmine dans la conception pyramidale de l'univers, ensemble des ensembles, ordre rigide, hiérarchisé de bout en bout en fonction d'un élément, et d'un seul.

A-t-on le droit d'invoquer ici Plotin? Quoi qu'il en soit, à une telle conception (21), le fédéralisme, au sens le plus large du terme, oppose ce que certains ont dénommé multi-level, multi-goal system (22), ou plus simplement, un ensemble de hiérarchies "concurrentes", ensemble qui ne tolère d'être structuré que sur plusieurs plans, dans plusieurs perspectives, de plusieurs points de vue à la fois. C'est ce que Mario Bunge lui-même appelle "integrated pluralism".

Sur ce point qu'il n'est pas interdit de considérer décisif, tout au moins à certains égards et tout specialement par rapport à ce qu'on pourrait appeler la philosophie du fédéralisme (23), il est réconfortant de constater qu'une démarche d'inspiration "purement scientifique" aboutit à une conclusion qui vient étayer la dialectique des hiérarchies. En effet, l'étude déjà citée de C.V. Henriques s'achève par le passage suivant:

"La distinction de niveaux supérieurs et inférieurs doit être maintenue, mais elle est relative. Ce qui est, d'un certain point de vue et à un certain stade, niveau supérieur, sera, d'un autre point de vue ou à un autre stade, niveau inférieur ... La distribution des rôles (...) entre les différents niveaux structuraux n'est donc pas fixée une fois pour toutes".

Et d'ajouter, puisqu'il s'agit en l'occurrence du problème de l'explication: "... le processus explicatif participe du dynamisme du processus d'objectivation des structures qui en constitue l'origine" (24). Rien de plus facile que de "généraliser" cette conclusion en reconnaissant que le processus de dialectisation pluraliste, multi-level, multi-goal,- et, pourrait-on ajouter, multi-channel - des hiérarchies participe du dynamisme - inépuisable parce que dynamogène - du processus d'objectivations du jallissement des structures dialectiques qui constitue l'origine. On peut ajouter, pour satisfaire une exigence de rigueur, que l'assimilation réciproque des niveaux n'interdit pas que soit maintenue une certaine primauté du supérieur; comme le dit Hasan Ozbekhan, en forçant un peu la note in fine: "... au double point de vue de la régulation et de la signification, c'est le niveau supérieur (...) qui éclaire l'organisation et le contenu (...) des niveaux inférieurs, alors que l'inverse n'est pas vrai (25)." Moins vrai serait sans doute ... plus vrai! Mais pour approfondir cette "approche" de la problématique il faudrait peut-être en venir à l'utilisation des matrices et des arbres de pertinence dont Robert H. Rea observe, tout-à-fait en passant (26), qu'ils peuvent être "tenus pour des cas particuliers de la structuration hiérarchique" - suggestion qui mériterait d'être méditée.

Pluralisme hiérarchique du fédéralisme

Pour en revenir au problème des hiérarchies concurrentes, il n'est peut-être pas superflu de rappeler, avec le même Ozbekhan, que la diversité des hiérarchies s'explique aussi par le fait qu'elles s'établissent en fonction [i] du but (goal), [ii] de l'objectif (objective) [iii] du dessein (purpose) et [iv] des fins (27). Pour cette raison, et pour d'autre également, le fédéralisme en tant que philosophie tend à développer la dialectique du savoir à égale distance entre la rigidité de la pure tautologie identificatrice et le prétendu spontanéisme de l'incohérence "néantissante"; à égale distance aussi, en tant que système de valeurs, du fixisme moniste de l'homogène et du pluralisme multitudinaire, celui de la dispersion, de la dissolution, de l'aquiescement au suicide.

Il serait tentant d'illustrer ce qui précède par l'exemple même du modèle fédéraliste. Celui-ci, non sans raison, fait apparaître la participation comme supreme commander. C'est elle, effectivement, qui exprime, qui accomplit le mieux, qui couronne les autres niveaux: l'autonomie, la solidarité, l'exacte adéquation ne s'épanouissent que dans la lumière de la participation, catégorie véritablement suprême de la société parce que métacatégorie ultime de l'être.

Néanmoins, sous un autre angle, le principe d'autonomie peut prétendre, si dire se peut, à la place du boss: autonomie des collectivités et des communautés de base, c'est-à-dire les plus proches de l'homme, et au sommet, au délà et au dessus de tout, autonomie de la personne et des personnes. Sans nul doute: toutefois, des hiérarchies quelque peu différentes pourraient être esquissées en prenant comme clé de voûte, soit la coopération conflictuelle, soit ce qu'on appelle généralement subsidiarité. Celle-ci n'apparaît-elle pas, à la limite, comme la formule structurante, non seulement de la société, mais du dynamisme universel, de l'être tout entier? Quant à la coopération conflictuelle, "rétro-position" de la solidarité: n'est-elle pas de quelque manière le reflet de ce terme unique, de ce principe des principes qui est le seul, en ultime syn-thèse, à in-former tous les autres:

"Il ne semble pas y avoir de terme unique qui exprime l'attitude, l'optique, le besoin ou l'aspiration, qui (...) confère une significa-

tion opératoire à la valeur située à la base de toute relation, (...), si ce n'est une conception élargie de l'amour ..." (H. Ozbekhan, souligné par l'auteur).

La grande différenciation des perspectives et des hiérarchies alternatives aboutit-elle à rendre inutile la tentative de formalisation dont j'ai résumé ci-dessus les grandes lignes et qui a été ensuite soumise à une analyse diacritique? Sincèrement, je ne le pense pas. En ce qui concerne notamment une formalisation plus poussée de l'ordre hiérarchique, il convient de tenir compte d'une observation de L. von Bertalanffy: "La théorie mathématique des systèmes constitue, aujourd'hui, un domaine en pleine croissance, mais il est naturel que les problèmes fondamentaux, comme ceux de l'ordre hiérarchique, ne soient approchés que lentement et exigent probablement des idées et des théories nouvelles" ((61 ii), p. 34).

Il me paraît donc souhaitable de pousser derechef plus avant cette tentative, hésitante parce que difficile, afin notamment de mettre en lumière la triple interprétation possible: méthodologique, épistémologique, ontologique, des résultats précédemment obtenus.

En puisant à la même source, procédons à l'inverse de l'ordre "ascensionnel"; abordons d'emblée le niveau-dimension de l'ontologie, et ce par une "définition" de grande portée.

Interprétation ontologique

(O_1) La Réalité (= le monde) est une structure de niveau telle que tout étant appartient au moins à un niveau de cette structure.

On n'a aucune peine à devenir le motif qui m'incite à souligner fortement la portée de ce "théorème": ne vient-il pas confirmer et renforcer - après, précisément, la pré-formalisation de N, c'est-à-dire de la structure de niveau, et de H, c'est-à-dire de la hiérarchie - la thèse dialectique (ou métalectique) qui fournit un commencement de réponse aux préoccupations des plus fondamentales du fédéralisme. Commencement de réponse que je ne voudrais pas trop infléchir dans mon sens; mais enfin, est-ce extrapoler abusivement que de prétendre que le théo-

rème en question, combiné avec les éléments dégagés antérieurement, ne peut que rendre plus difficile la conception de l' "univers" comme d'une hiérarchie, non seulement unique mais en quelque sorte homogène, comme d'un enchaînement univoque des étants, pour ainsi dire établis une fois pour toutes, et qui seraient susceptibles, contrairement à la remarque déjà citée de Karl Popper, et de description et de preuve finales?

On peut même, avec quelque témérité, tenter d'aller plus profond. Au risque de me répéter, mais l'enjeu justifie cette insistance, je serais enclin à dire que "O_1" renforce l'opposition au monisme dans la mesure où il aide à comprendre l'originalité - et donc une certaine irréductibilité - de chaque niveau, en même temps que leur caractère relatif, id est relationnel, voire trans-formable. Situation éminemment dialectique dans laquelle l'identité qui fascinait Meyerson apparaît comme contre-partie "rétro-duite" de l'incessante novation.

Par parenthèse, il n'est pas interdit d'observer aussi que cet "O_1" ne paraît guère favorable au réductionisme, de quelque nature qu'il soit: idéaliste ou matérialiste, rationaliste ou irrationaliste, marxiste, freudien ou panlinguistique.En vérité, tous ces reductionnismesne sont, malgré les apparences contraires, que des voies d'accès au monisme qui a été déjà condamné et rejeté à plusieurs reprises. Mais non point, faut-il le rappeler? au profit du pluralisme qualifié de multitudinaire: bien que l' "univers" ne soit point homogène, il n'est pas non plus fractionné en entités, secteurs ou domaines séparés, cloisonnés, isolés les uns des autres.

L'élimination du pluralisme multitudinaire que Mario Bunge désigne comme "unqualified" (par opposition au pluralism "intégré"), et de tout monisme avoué ou honteux, s'effectue donc au seul bénéfice d'une conception qu'exprime une formule devenue banale: unité dans la diversité.

On n'ignore pas sans doute que c'est la formule du fédéralisme.

D'autres hypothèses ontologiques pourraient être citées, concernant par exemple le procès d'emergence (O_2), les rapports entre les niveaux antérieurs et postérieurs, anciens et nouveaux (O_3), le caractère de relative autonomie et stabilité de chaque niveau, etc. S'agit-il d'ontologie, du reste, ou d'ontogenèse? Le doute reste permis.

De toute manière, il ne saurait y avoir rupture de continuité ra

dicale entre les réalités ou les thèses ontiques (ayant trait à l'être) et le savoir, notamment scientifique. Non point que l'épistémologie puisse refléter l'ontologie, tel un miroir, mais (pour utiliser derechef le distinguo proposé par J. Piaget) elle peut prétendre à la réfléchir: d'où la possibilité de formaliser aussi les "principes" du savoir.

Interprétations épistémologiques et méthodologiques

Parallèlemnt au "théorème" O_1, établissons E_1:

E_1 La structure de niveau réelle est connaissable (au sens large) et le savoir, notamment scientifique, est une structure de niveau qui "balance" l'autre (28).

Plus significative encore que la formulation de ce principe me paraît être son interprétation négative: "... aucune science particulière ne saurait embrasser le tout du réel. Thèse qui contredit ce complice épistémologique du monisme qu'est le réductionisme" (M. Bunge). Voilà qui ne laisse de conforter l'approche fédéraliste du problème. Ce qui ne signifie aucunement, il est grand temps de l'exprimer avec netteté, que toute réduction soit condamnable. En effet, dans la perspective méthodologique, M_1 pourrait être formulé comme suit:

M_1 Il convient, au départ, de limiter la recherche à un seul niveau; toutefois, si celui-ci devait se revéler insuffisant, et dans ce cas seulement, il conviendrait essayer d'étendre la recherche à d'autres niveaux .

Texte commenté de la manière suivante, par le même Mario Bunge:

" ... Il faut rester attaché au réductionnisme (méthodologique) jusqu'à ce qu'il échoue: un programme réductionniste est aussi instructif lorsqu'il échoue que lorsqu'il réussit. Le réductionnisme méthodologique, s'il reste ouvert (open-minded), est compatible avec le pluralisme intégré, alors que, par ailleurs, le particularisme (ou séparatisme) des niveaux ne l'est pas" (29).

Il serait peut-être prématuré, au point où nous sommes, de pousser plus avant l'élaboration, la formulation, la formalisation parallèles de thèses, hypothèses ou normes, qualifiées d'ontologiques, épistémologiques ou méthodologiques; et ce, notamment, pour une raison exprimée par un auteur souvent cité dans cette étude, le mathématicien A. Rapoport:

"Les récompenses de l'analyse systémique sont données, typiquement, sous la forme de problèmes nouveaux plutôt que comme solution des vieux problèmes. Ces récompenses n'en sont pas moins réelles, car la formulation de problèmes nouveaux implique habituellement l'affinement (sharpening) des concepts nouvellement trouvés et une réorientation de l'énergie intellectuelle vers des domaines neufs ..." (in (61 ii), p.74).

De son côté, un autre mathématicien, C.V. Henrique, précise dans un texte dont il ne serait pas difficile d'étendre, de renforcer, d'exhausser la portée: "... le processus (...) est (...) indéfini, restant ouvert par rapport à la structuration ... il est vrai en tout cas que l'explication suppose la construction de plus hauts niveaux de structuration ..." (souligné par l'auteur). Mais même sans prétendre systématiser davantage, il est permis de suggérer quelques conclusions provisoires.

Tout d'abord, il est à remarquer que si des liens existent, et ils ne peuvent point ne pas exister, entre les perspectives ontique, épistémologique et méthodologique, ces liens ressortissent au domaine des inférences souples, pour ne pas dire lâches, que Mario Bunge lui-même résume d'une manière frappante:

"If O_i and E_i , then II_i

NOW, M_i

Hence, maybe O_1 and E_i".

Ensuite, il n'est pas interdit d'observer que si la formalisation, dont je me suis abondamment servi, manifeste encore un caractère introductif, on peut affirmer aujourd'hui, avec M.D. Mesarovic, que n'importe quelle description, même formulée dans un langage trivial, peut être rendue formalisable dans le cadre d'une systématisation générale (30). Ou encore, comme le proclame Lars Löfgren, que "tout ce qui peut être effectivement expliqué peut être formalisé". Pour ce faire, il convient toutefois d'avoir recours à une "mathématisation" beaucoup plus poussée, à l'instar precisement de Mesarovic, de Lars Löfgren, de Preston C. Hammer, etc., ou encore de George J. Klir, déjà cité (31).

Faut-il répéter, à cette occasion, que mathématiser n'est pas

synonyme de quantifier et que, comme le rappelle volontier André Lichnerowicz (notamment dans la préface à l'ouvrage déjà mentionné de Pierre Delattre), ceux qui "croient et enseignent que les mathématiciens règnent sur la quantité et sur l'étendue" s'égarent, car "déjà à travers les algébristes anglais, à travers Riemann ou Dedekind, les mathématiciens ne savent plus ce qu'est cette prétendue quantité et cette prétendue étendue". Ou comme le dit d'une manière plus positive Kenneth E. Boulding: "même s'il n'a pas encore comblé l'avance des mathématiques "classiques", celles de la quantité et du nombre, le développement des mathématiques de la qualité et de la structure est déjà en bonne voie"(32).

Enfin, il est aussi permis d'insister, une fois de plus, sur le caractère ouvert de l'élaboration systémique, telle qu'elle a été amorcée ci-dessus, ainsi que sur son orientation pluraliste dont j'ai déjà dit combien elle renforçait les positions philosophiques, voire ontiques, qualifiées de fédéralistes, que je n'ai cessé d'affirmer: pluralisme des buts, objectifs, desseins et pro-jets (ou fins), pluralisme des niveaux - multi-level, multi-goal, multi-channel - qu'il faudrait compléter par le pluralisme des hiérarchies. A condition de ne jamais perdre de vue que la "métaphysique de la science", pour employer une expression critiquable de M. Bunge, "reconnaît l'existence de niveaux d'organisation distincts mais interconnectés (interrelated)". Dans le cas contraire on retomberait immanquablement dans le particularisme, séparatisme, pluralisme "non qualifié", toutes retrojections, plus ou moins camouflées, du monisme en miettes.

Le temps et la perspective

Au début de cette recherche systémique, je n'ai pas hésité à rapprocher, par anticipation, les concepts de système et de prospective. Nous sommes mieux armés maintenant, semble-t-il, pour thématiser ce rapprochement.

Prise à la lettre, l'entreprise serait démesurée: n'obligerait-elle pas à poser le redoutable problème, antique et ontologique, de la "nature" du temps? Il n'en saurait être question ici; mais peut-on parler de prospective sans essayer tout au moins de situer le problème par rapport

à la structure traditionelle: passé, présent, futur.

Dans son fameux article de 1957, qui fondait publiquement la prospective - quatorze ans après le lancement de la "futurologie" par Ossip Flechteim-Gaston Bergor (dont on oublie de rappeler, le plus souvent, qu'il fut un fédéraliste convaincu)- écrivait:

"Notre civilisation s'arrache avec peine à la fascination du passé ... Lorsqu'elle élabore des projets (...), elle les dessine sur une toile où c'est encore le passé qui se projette. Elle est rétrospective, avec entêtement. Il lui faut devenir prospective".

On peut prendre son appui sur cette opposition quelque peu simpliste entre le passé et le futur.

C. West Churchman, professeur à Berkeley, nous aide alors à faire le premier mouvement, même s'il s'agit encore d'un geste incertain, en parlant d' "inquiring systems" (33) et, plus spécialement de ceux "whose purpose is to predict the future or (...) to estimate trends".

Churchman lui-même, bien que pragmatique et non "métaphysicien" ne peut éviter la question de savoir "quel est le rapport entre la composante d'un système inquiring qui décrit le passé et la composant de celui qui prévoit l'avenir (34)". Et de répondre avec pertinence que le fameux sens commun - dont nous savons maintenant combien il peut être trompeur - "à la question concernant le rôle que le futur jouerait dans la tentive de décrire le passé, serait enclin à donner une réponse toute prête: aucun rôle du tout".

Intégrer le passé et l'avenir

Sans revenir par ce biais au problème fondamental du temps (35), qui n'est autre que le problème de l'être, on peut suivre Churchmann lorsque, grâce à une dialectique quelque peu élémentaire, il s'efforce de résumer les différentes positions possibles: "séparer le passé et l'avenir", "prevoir à partir du passé", "reconnaître le passé mais non le futur", etc., pour défendre finalement une thèse que le sens commun considère comme son "ennemie mortelle": intégrer le passé et l'avenir.

La première conclusion que l'on peut en tirer risque de paraître paradoxale: "... La reconnaissance du passé est inséparable de la reconnaissance du futur... Il faut que nos jugements sur l'avenir soient

pertinents et efficaces pour nous rendre capables de traîter efficacement le passé"(36). N'y a-t-il pas quelque chose de choquant, ou tout au moins de forcé, dans ce rapprochement entre les deux des trois "dimensions" du temps? Peut-on prétendre connaître (au sens large) le passé qui, si dire se peut, existe à jamais puisqu'on "ne peut rien y changer", puisqu'il est en quelque sorte réduit à l'immobilité en fonction de l'avenir qui, lui, n'existe pas et ne peut donc, d'aucune manière, nous fournir une base sure, se profilant au contraire comme un horizon insaisissable de mobilité et d'incertitude?

Mais que veut dire exister dans ce contexte? Quel est par exemple le mode d'existence du passé? Est-il consigné, conservé, entreposé, embaumé, momifié quelque part - et si oui, ou? Pour pouvoir le découvrir de quelque manière, ce passé immuable, dans quelle demeure de la maison de l'Etre faut-il prétendre accéder? Et comment affirmer péremptoirement que le passé est ce qui ne change point et ne peut changer, alors que les faits disent tout le contraire? Il suffit de secouer le joug du sens commun et d'ouvrir les yeux pour constater que le passé, individuel ou collectif,change sans cesse.

Constater est le mot juste, car il s'agit de phénoménoscopie ou de phénoménologie, et non de théorie. Mon passé, par exemple, est différent, aujourd'hui, de ce qu'il était il y a, disons, six ou sept lustres. Et non seulement parce que trois décennies se sont ajoutées à celles qui précédaient, mais parce que l'ensemble s'est modifié: et non seulement en s'enrichissant, mais en se trans-formant,, voire en se trans-figurant. Raisonnement facile à transposer dans la perspective historique. Que l'on veuille comparer, par exemple, l'histoire romaine telle qu'elle était rédigée il y a deux ou trois siècles et telle que l'élaborent nos contemporains. Evidemment, notre savoir factuel est sans contste beaucoup plus ample, plus développé, plus approfondi; mais au délà de cet enrichissement, il y a quelque chose de beaucoup plus important, et c'est précisément la trans-formation de notre passé qui, notamment depuis la fin du XVe siècle, paraît tracer une courbe exponentielle.

En vérité, rien ne s'oppose à ce que soit tentée, dans la perspective de la prospective, l' "intégration" du passé e de l'avenir. Et si un

Raymond Aron, toujours agréablemnt sceptique, observe que ce n'est que pour se distraire qu'il lit les livres sur l'an 2000, on peut lui répondre que tout est dans la manière dont le futur ou le passé sont abordés. Déjà Gaston Berger l'a dit: "Toute pensée de l'avenir n'est pas nécessairement prospective: on peut rêver à l'an 2000 comme à l'Egypte de Ramsès II" (37).
Mais et le passé et l'avenir peuvent susciter une tout autre "approche" que celle du rêve ou de l'amusement blasé. Encore faut-il s'efforcer de savoir de quoi l'on parle.

Pro-jet, non pré-diction

A ce propos, il convient de relever ce qu'il y a d'ambigu dans la pré-définition des "inquiring systems", citée précédemment. La seconde partie: to estimate trends, est plus satisfaisante que la première: to predict the future, mais les deux ensemble ne font qu'amorcer le débat. En effet, même si la description, l'analyse et la synthèse tendancielles sont appelées à constituer une composante importante, voire essentielle de la méthodologie générale - compte tenue du fait que le réel est composé de tendances bien davantage que d'états - rien ne permet d'en traiter en bloc, en négligeant les distinctions nécessaires. Rien ne permet a fortiori de confondre prospective et prédiction.

Et certes, je n'ignore point que le grand futurologue norvégien, Johan Galtung, distingue entre recherches prédictives et recherches prescriptives, distinction qui mérite d'être prise en considération, et qu'il n'hésite pas à identifier l'analyse des tendances avec le premier type de la prévision (38). La terminologie, pour une part, reste toujours libre, pouvant résulter d'un accord de caractère conventionnel. En l'occurrence, toutefois, la terminologie proposée paraît, dès le début, susciter une équivoque qui risque d'être difficile à dissiper. Comme bien des penseurs l'ont précisé à satiété, la confusion entre la prédiction et la construction de l'avenir est source de malentendus: or, seul l'effort de construction semble pouvoir prétendre à la dignité de la prospective dans la mesure même où cet effort traduit la dignité et la vocation de l'homme créateur.

Du reste, soit dit en passant, C. West Churchman lui-même paraît vouloir corriger sa formule simpliste en ajoutant, quelques pages plus bas, "it is in fact much more than a simple forecast ...".

Pour tenter d'éviter ou, tout au moins, d'atténuer ces hésitations, malentendus et confusions, il convient de se souvenir que, d'une certaine manière, la prospective, elle aussi, se constitue en système et que, par conséquent, elle doit être traitée comme tel. La question qui se pose est donc: comment la modéliser?

Il semble bien que l'on puisse y répondre d'emblée: en y introduisant la distinction fondamentale, commandée par le modèle universel, entre processions, procédés, procédures et processus. Autrement dit, en "étageant" le système - prospective selon les niveaux suivants:

[i] éléments premiers: les données d'une situation (c'est-à-dire le réel que j'appelle secret et que l'on qualifie généralement de concret);

[ii] traitement de la réalité par l'analyse qui permet d'en dégager les possibles (dont on peut rappeler que, pour Leibnitz, ils constituent la mesure du réel);

[iii] construction des futurs probables (notamment par la recherche de "faits porteurs d'avenir" et par leur combinatoire ou théorisation);

[iv] dé-rivation: choix parmi les "futurs alternatifs" (id est émergence d'une "dimension" verticale, celle du volontaire, du décisionnel, du normateur).

Ce modèle systémique ne resoût pas, certes, tous les problèmes - aucun modèle ne saurait y parvenir - mais il permet de les formuler, et de les situer, avec plus de clarté; peut-être même, de commencer à en résoudre quelques uns. En tout cas, il rend impossible la réduction, déjà dénoncée, de la prospective à la prévision, prédiction, extrapolation, tout en permettant d'en justifier partiellement l'usage à certains niveaux et dans certaines perspectives.

Ce qu'il convient de souligner fortement, c'est l'importance, pour le système-prospective comme pour tous les systèmes, du [iv] me niveau, celui où interviennent, en l'occurrence, le souhaitable, le désirable,

le voulu, ou mieux: les choix, les valeurs, les décisions, les normes. Irruption gênante, surtout pour les scientistes, qui - sans toujours l'exprimer clairement - la ressentent comme un crime de lèse-science. Tout ce qui est scientifique n'est-il pas complètement fermé aux jugements de valeur et donc, a fortiori, à l'introduction volontaire du normateur? Ne doit-on pas s'en tenir fermement à l'adage is cannot imply ought? Autrement dit, pas de confusion entre description et prescription.

Equivoques du positivisme

A quoi Thomas S. Kuhn réplique, avec désinvolture, que ces "rengaines" sont périmées et que les prétendus principes dont elles se réclament ne sont plus guère respectés. Parmi les penseurs qui scrutent l'horizon des sciences les plus avancées, nombreux sont ceux qui ont découvert des cas importants où "le normatif et le descriptif sont inextricablement mêlés; est (is) et doit être (ought) ne sont en aucun cas aussi séparés qu'ils paraissaient l'être (39)".

En fait, c'est le positivisme, même s'il se veut néo-positivisme, qui s'efforce de résister, désespérément, à la révélation de la véritable nature de la science - et notamment des sciences, les plus exactes, les plus précises, les plus rigoureuses - en fermant les yeux sur son in-formation trascendante Or, une telle in-formation, même si elle acquiert, dans certains cas comme celui de la prospective, une importance exceptionelle, est à l'oeuvre, peu ou prou, dans tous les domains. Lorsque Hasan Ozbekhan, dans un texte cité précédemment, affirme que c'est le niveau supérieur qui, "au double point de vue de la régulation et de la signification, (...) éclaire l'organisation et le contenu (...) des niveaux inférieurs", à sa manière il "révèle" la transcendance. De même un Jean Ladrière lorsqu'il observe, par exemple, que l'horizon "qui ouvre un champ infini aux opérations possibles et commande leur déboîtement progressif (...), n'est pas donné à l'avance et ne pourrait être thématisé", et que "l'horizon de la forme pure n'est donc rien d'autre que la transgression interne (...) qui constitue le véritable moteur de la recherche ..." (souligné par moi). De même aussi un Rolando Garcia lorsque, se reportant à Tarskin il rappelle que "le langage dans

lequel nous pouvons nous référer à un énoncé de la théorie ne peut être celui dans lequel nous exprimons la théorie elle-même" et que, par conséquent, "il nous faut un méta-langage ..." (souligné par l'auteur). De même encore C.V. Henriques lorsque, consonant avec Ladrière, il met en lumière le caractère indéfini, c'est-à-dire à jamais ouvert, de la cognition scientifique dont le "procès" n'est concevable que dans la mesure où il postule la possibilité de construire toujours "de plus hauts niveaux de structuration ..." (souligné par l'auteur). De même enfin Jean Piaget, dans de très nombreux passages de son oeuvre, et notamment lorsqu'il insiste sur ce fait paradoxal que "pour achever une théorie (...), il ne suffit pas d'analyser ses présupposés, mais il devient nécessaire de construire la suivante"; en d'autres termes, déjà utilisés antérieurement, que la justification du procès scientifique est à chercher davantage dans les points d'arrivée que dans les points de départ, "mais dans les points d'arrivée en tant que fermetures relatives accompagnées d'ouvertures sur de nouvelles constructions"(souligné par moi).

La convergence ascendante de ces témoignages ne saurait être due au hasard. Que l'on songe que "le savoir n'est point passivement donné, en, dernier ressort, on travers surtout de l'input informationnel de l'appareil des sens, mais plutôt construit activement et reconstruit ..." (Walter Buckley, in((61 ii), p. 189, souligné par moi). Construction, qui échappe nécessairement, non seulement à toute passivité, mais aussi, de quelque manière à tout donné ou plus exactement, qui le dépasse pour l'in-former.

L'avantage de la méthode systémique est de montrer clairement que, sur ce point, la prospective, quels que soient ses traits distinctifs et spécifiques, ne fait pas exception à la règle, tout au contraire. Il n'y a de science en générale, que par le risque et l'aventure, par la découverte et l'invention, par la transgression, c'est-à-dire par l'ouverture, le dépassement, la création. Dans le cas qui nous occupe présentement, le dépassement s'accomplit par la valorisation. Concept à la fois "objectif", car les valeurs s'imposent, et "subjectif" car les valeurs sont posées par l'homme; mais qui en tout cas ne saurait être considéré anti-scientifique. Ce qui serait contraire à la science, ce serait de refuser de prendre conscience du rôle décisif de cet "opérateur" ou "opérateur" axiologique, transascen

dant et transdescendant, en raison d'un certain nombre de préjugés dits positivistes qui ressortissent à la "maladie infantile" du savoir scientifique, notamment au "mechanism, physicalism, ou reductionism" (Anatol Rapoport((41). On comprend l'exaspération d'un Ludwig von Bertanlanffy qui s'écrie: "Il faut dire que le positivisme moderne a été un mouvement singulièrement stérile". Ces Messieurs qui excellent dans la surenchère scientiste,"paradoxalement, n'ont enrichi la science moderne, ni par quelque recherche empirique ni par une idée nouvelle"(42). Tout compte fait l'expression que Walter Buckley utilise (in (61 ii), p. 197) pour condamner l'empirisme,prétendu scientifique en son temps, d'un Locke ou d'un Hume: fundamental inadequacy, s'applique à fortiori au scientisme positivisme.

Mises au point

Dans le cas de la prospective, il vaut la peine de le répéter, le IVème niveau ne constitue nullement une exception, mais ne fait qu'illustrer et confirmer la règle. Même la valorisation, inséparable de la quête de l'à-venir, ne contredit nullement la norme de l'objectivité: tout au contraire, dans la plupart des modèles (non tronqués, s'entend), l' "objectivité ne peut même pas commencer d'apparaître si elle ne prend la forme d'une valorisation". La prospective implique seulement une accentuation de ce "facteur, de ce caractère normateur. et ce pour une raison facile à saisir: elle est un système d'action par excellence.Or, "aucun fait appréhendé dans l'optique de l'action (...) ne peut être appréhendé, compris ou interprété intelligemment qu'en termes de valeur"(43).

Ce qui se confirme, paradoxalement, jusque dans la perspective mathématique. Avec une extrême circonspection, un mathématicien contemporain, déjà souvent cité, ne concède-t-il pas, comme à contre-coeur, que l'élargissement de la théorie des jeux, par exemple, "pose des problèmes qui ne peuvent être formulés sans une certaine référence à l'équité ou à des concepts analogues incompatibles (irrelevant) avec le contexte de la théorie classique ...". Et d'ajouter: "La nécessité d'introduire de tels concepts sans abandoner pour autant les exigences de rigueur de l'analyse mathématique, incite le théoricien (...) à se tourner vers des problèmes situés

dans certains domaines de la philosophie" (A. Rapoport, in (61 ii), p. 73).

Un autre mathématicien observe en passant que ce qui, du point de vue strictement "mathématique", peut être défini détermination d'un ensemble partiellement ordonné, du point de vue topologique - axé sur le concept d' "approximation and its derivative: optimality or optimization" - peut être défini comme une tentative de détermination, parmi les possibles solutions alternatives d'un problème, de la solution "most desirable" (Josef V. Cornacchio, ibid, p. 307). Il est à remarquer que les derniers guillemets figurent dans le texte, comme pour atténuer ce que ces mots peuvent avoir de scandaleux.

Pour en revenir à la perspective philosophique, évoqué par A. Repoport, on peut défier derechef les positivistes, anciens ou nouveaux, en reconnaissant que, d'une certaine manière, l'objectivité et la valorisation sont donc appelées à se rejoindre, pourvu que ce soit en montant: mise au point qui a l'avantage d'éviter nombre d'équivoques, de tâtonnements, d'approximations. Lorsque, par exemple, Bertrand de Jouvenel rejette le terme de futurologie qui risque de faire passer la prospective pour une "discipline" telles la biologie, la sociologie, la psychologie, etc., il n'a pas tort. Mais implicitement, c'est de l'état anté-probabiliste de la science qu'il s'efforce de distinguer l'étude du futur. Et lorsqu'il avance à son tour le vocable de "futuribles" forgé à partir du futur et du possible - c'est, curieusement, au même état de la science qu'il paraît vouloir s'en tenir puisqu'il ne se réfère ainsi qu'aux nivaux (i) (phénoménoscopie, phénoménographie, phénoménologie) et (ii) (analyse des lignes de force du possible) du modèle.

Le même modèle interdit qu'on parle, sinon à titre d'approximation transitoire, de"prospective prédictive" (comme opposée à la "prospective prescriptive"). Faut-il ajouter derechef qu'il élimine radicalement la confusion entre l'extrapolation, à partir du passé, et la construction du futur, à partir de l'à-venir, plus exactement de l'à-faire-venir?

On voit donc, tout au moins j'ose l'espérer, que la thématisation de l' "assimilation", de prime abord surprenante, entre prospective et système n'est pas un exercise de style - ou de haute voltige. Entre les deux, s'établissent des relations, non seulement de simple (i) rapprochement, mais aussi, au-delà et au-dessus des (ii) ressemblances et même des (iii) isomorphismes, d' (iv) analogie ou, mieux, d' (iv) analectique. Du reste, un esprit aussi exigeant que M.D.Mesarovic ne

va-t-il pas jusqu'à proclamer, d'une manière excluant toute équivoque, que tout système peut être décrit comme un "input-output (terminal) system" ou comme un système tendu vers une fin (goal-seeking) et donc vers le futur? L'expression "goal-seeking" ayant été référée préalablement à d'autre expressions non moins significatives: decision-making, problem-solving, teleological(in (61 ii), G502SS & 257).

Par parenthèse, j'introduis ici une remarque incidente. On aura déjà noté que, par souci de cohérence terminologique,ana-lectique remplace ana-logie. En effet, en fonction du modèle universel les suffixes s'ordonnent comme suit: (i) logie, (ii) lytique, (iii) logique, (iv) lectique. Mais une raison supplémentaire me pousse à substituer un autre terme à celui d'analogie: c'est que celui-ci, à l'usage, s'est banalysé, étant devenu synonyme des notions vagues groupées autour du vocable de ressemblance. Or, analogie méritait beaucoup mieux, si l'on songe notamment que - comme le rappelle encore Anatol Rapoport, - "all theoretical thinking is analogical" ((61 ii), p. 48). L'introduction d'un terme nouveau, non hypothèqué, comme analectique, aide à briser les mauvaise habitudes intellectuelles.

La parenthèse refermée, je reviens à mon propos. Une interprétation systémique du fédéralisme a été déjà esquissé: il parait donc pour ainsi dire naturel, maintenant de s'interroger sur les relations qu'entretiennent, par le truchement du "système", le fédéralisme et la prospective.

Toutefois, il s'agit là d'une articulation de la pensée systémique qui, si certaines précautions ne sont pas prises et certaines garanties obtenues, risque de se révéler aberrante.

Unité et pluralité

Plus d'une fois, il m'est arrivé de stigmatiser le réductionisme: mais il est permis de se demander si nous ne sommes pas en train, insensiblement, de réduire les différents systèmes les uns aux autres pour, à la limite, aboutir à un système unique.

Ce n'est pas de cela qu'il s'agit, évidemment. Dans la mesure où ils ne sont pas purement conventionnels, les systèmes ne se laissent

jamais réduire. Aucun système inscrit dans le réel - que ce soit "objectivement" ou "subjectivement" - ne saurait s'effacer complètement au profit d'un autre, de même nature. En vérité, nous savons déjà que le seul espoir que nous puissions nourrir à leur égard, c'est qu'ils se compètent, s'éclairent, s'enrichissent, se trans-forment les uns par les autres.

Mais alors, comment éviter que tombe, comme un couperet, le sixième axiome de la théorie générale, tel qu'il a été élaboré par Churchman :

"Il n'existe qu'un et qu'un seul système général".

L'auteur ne manque du reste point de préciser, entre parenthèses: monisme!

Pour être juste, il y a lieu d'ajouter que les huitième et neuvième axiomes rappellent que "la théorie générale du système est constituée par la méthodologie de la recherche du système général" et que cette "recherche devient, avec le temps, plus difficile et n'est jamais achevée", le tout étant suivi, toujours entre parenthèses, par le mot, rassurant pour nous, de réalisme (44). Mais une telle "compensation" peut-elle suffire?

En vérité, il faut reconnaître que nous nous trouvons en présence d'une de ces difficultés ultimes qui ne peuvent même pas être exprimées, sinon dialectiquement. Dans "De la Méthodologie ...", j'ai essayé de suggérer que la dialectique est finalement "subsumée" par deux modèles, N° 20 et 21, celui de la dialectique englobante et celui de la dialectique ouverte, qui co-respondent rigoureusement l'un à l'autre, mais ne se confondent point. Quant au n° 22 qui serait pour ainsi dire le modèle des modèles, il fascine, certes, mais c'est sa non-existence qui exerce la fascination. Tout simplement parce que ce super-modèle constituerait en quelque sorte un point final: or, comme le rappelle Mario Bunge, "science (...) is never final"; les problèmes fondamentaux, soit strictement scientifiques, soit épistémologique et ontologiques, ne trouvent jamais de "solution finale" (45).

C'est pourquoi G.J. Klir peut parler, non sans raison, du "particular general system" (ou de la classe particulière du système général) et voir en lui le modèle d' "une large classe de différents systèmes particuliers" (ou d'une classe particulière de systèmes), en prenant du reste le soin de préciser que le système général "is not unique".

Les "systèmes différents déploient (display) toutes les propriétés du système général (et, ajoute-t-il, "ces propriétés seulement"). ... Ils possèdent des traits fondamentaux différents, c'est-à-dire differents niveaux de solution, différentes structures, etc. Néanmoins, il existe une théorie unique, dédiée à la classe de tous les systèmes généraux qui, clairement, sera appelée théorie générale des systèmes".

On décèle, dans ces formulations, une tension dialectique qui se manifeste aussi par le balancement entre la "multiplicité de systèmes généraux" et "l'universalité de la théorie générale des systèmes" (46).

Ce n'est que sur le fond de toutes ces précautions que l'on pourrait paraphraser, toujours dans un contexte terminologique différent, le paradoxe de Heinrich Rombach: un système n'est jamais tout à faits un système; il est toujours le système (47).

Affinement du modèle du fédéralisme

Ce qui précède n'est certes pas suffisant pour écarter toutes les équivoques, mais nous autorise, semble-t-il, à procéder à la confrontation annoncée entre le "système-prospective" et le "système-fédéralisme".

Celui-ci, nous le savons déjà; peut être modélisé comme suit:

[i] Procession des éléments de base, c'est-à-dire des autonomies.

[ii] Procédés de traitement qui, analytiquement, fondent la coopération conflictuelle.

[iii] Procédures d'élaboration qui permettent d'édifier et d'organiser l' "espace" fédéraliste grâce à l'application du principe régulateur d'exacte adéquation.

[iv] Processus de dérivation qui, en l'occurrence, érigent la participation en syn-thèse "transcendantale" et en accomplissement pluridimensionnel des trois autres niveaux. En effet, il ne faut pas oublier que le processus, au (iv)ème niveau, non seulement tendant à se combiner entre eux, dans un effort de dépassement et d'accession à l' être - ou de pre-création de l'être - mais aussi ne cessent de rétro-agir sur les (i) liaisons, (ii) relations, et (iii) références de ce que j'appel le immanence ou transition.

Ainsi résumé, en fonction du modèle universel du savoir, le fédé-

ralisme en tant que système se rapproche-t-il ou s'éloigne-t-il du système-prospective? La réponse ne s'impose point avec évidence. Toutefois, les choses changent peut-être dans la mesure où le modèle du fédéralisme est interprété de la manière suivante:

(i) Le fédéralisme est un réalisme; il part donc de ce qui "est", au sens banal du terme, c'est-à-dire des données réelles d'une situation "concrète" (ou secrète dans ma terminologie).

(ii) De la réalité primaire, en la traitant comme un champ du possible, le fédéralisme dégage, par l'analyse, les composantes d'une aporétique dynamogène, dont le "pattern" se reflète notamment dans le rapport entre conflit et coopération ou, comme l'exprime John H. Milsum, entre "coopération" et "competition". Il considère ce rapport comme le "Key basic" procès dans le systèmes vivants et observe que les influences exercées par chacun de ces deux pôles sont "inextricablement mêlées". D'où la complexification incessante des problèmes générés au fil de tels procès.

(iii) Les problèmes qui ne sont donc pas posés arbitrairement, par exemple en fonction d'une idéologie, mais qui se posent ainsi réellement et dans le réel, suscitent une combinatoire dont les "faits porteurs d'avenir" constituent les principaux facteurs, permettant l'élaboration d'une théorie à caractère stochastique. Par parenthèse, rappelons à ce propos que A. Wayne Wymore considère que l'intégration (subsumption) des procès stochastiques dans la théorie des systèmes est appelée à constituer, dans les années à venir, l'un des principaux progrès à rechercher, l'une des principales tâches à accomplir (48).

(iv) Mais le fédéralisme ne se contente pas d'appréhender, de conceptualiser, de théorétiser le "concret du départ": il tend à le transformer, à le trans-figurer même, il vise l'action.

C'est pourquoi, parmi les futurs alternatifs, possibles et probables, le fédéralisme opère un choix radical et, bien que "déterminé", libre et novateur. Il opère par la volonté, par la décision, par la norme, celle-ci étant du reste conçue non point comme une valeur "abstraite", id est abstruse, mais comme une valorisation concrète, au sens plein, c'est-à-dire selon la mesure propre de toute chose.

Ainsi transposé, le système-fédéralisme révèle une singulière parenté avec le système-prospective, tel notamment qu'il a été esquissé antérieurement. Parenté qui est conclusion d'importance majeure, en même

temps qu'une nouvelle base de départ illuminée par les rayons d'une aurore naissante.

Limites de la contre épreuve

Peut-être faudrait-il compléter - ou corriger - cette tentive de "translation", du fédéralisme à la prospective, par le mouvement inverse; on verrait alors que, tentée dans le sens contraire, la "vection" (ou duction) susciterait des difficultés differentes, plus considérables.

Certes, on peut convenir que les éléments premiers dont part la prospective sont, dans un sens quelque peu forcé, autant d'entité "autonomes", dans la mesure toutefois où l'on ne prétend pas procéder "à partir du donné indifférencié, de cette nébuleuse à laquelle, au départ, nous appartenons, de ce monde dans lequel tout co-existe, tout se mêle" bref de ce que j'ai appelé le "chaos primaire"(49).

Ce point mérite considération, afin d'éliminer dès l'origine du "procès" une ambiguïté qui deviendrait vite destructive. En somme, c'est le problème "de l'opération de partition en éléments" (P.Delattre) et des rapports entre le secret et le discret (en l'occurrence, entre le continu et le discontinu), qui est ainsi pesé.

On pourrait, certes, trouver dans la solidarité ou dans la coopération conflictuelle de quoi ensemencer, tout au moins partiellement, le champ du possible, c'est-à-dire le niveau de la prospective; de même, en essayant d'ajuster l'exacte adéquation à l'étude du (iii) probable. Après tout, ce que Guy Héraud appelle l'exacte adéquation, n'est-ce pas un principe régulateur qui permet, d'une certaine manière, la distribution la plus "probable" - dans le sens des probability distribution des pouvoirs et des compétences? Et la coopération, elle, pour y revenir un moment, ne s'organise-t-elle pas "selon une pluralité de directions possibles", excluant, comme pour le futur, "d'une part l'unicité et d'autre part l'infinité des lignes (...) concevables (50)".

Un changement notable se produit - mais celà n'est pas fait pour nous surprendre - lorsque l'on "aborde" le niveau-dimension. En effet, la participation est un concept englobant - à la fois épis témologique et social, politique, économique et sociétal, epistémologique et ontologique - qui se laisse aisément traduire en termes de choix, de déci-

sion, de valorisations, d'information non seulement normative mais normatrice.

Rencontre au sommet qui ne doit pas nous faire perdre de vue la découverte inscrite en filigrane dans les lignes qui précèdent, à savoir que les application de S_f (fédéralisme en tant que système) en S_p (prospective) et de S_p en S_f ne comportent ni les mêmes difficultés ni les mêmes potentialités. Autrement dit S_f et S_p ne sont pas"symétriques". Ou encore: la distance de S_f à S_p n'est pas égale à la distance de S_p à S_f.

Découverte qu'il faudrait formaliser pour en tirer quelques conclusions de vaste portée. En attendant, ce qui importe c'est de comprendre, plus simplement, que si les deux systèmes S_f et S_p ne se recouvrent pas - ce qui, du reste, ne serait en aucune manière souhaitable - s'ils n'ont pas par exemple la même extension, notamment dans le temps - l'inter-action entre la prospective et le fédéralisme, effectué par le truchement du modèle universel du savoir, reste un fait acquis dont l'importance ne saurait être sous-estimée.

Le fédéralisme comme englobant

Au début de cette étude, je n'ai pas hésité à laisser entendre que, d'un certain point de vue, il n'y a de prospective que dans la mesure où il y a système; et que, par ailleurs, le processus de systèmes, dans une montée en spirale "à tours de plus en plus larges", paraît irrésistiblement attiré par ce qui n'est pas encore, par ce qui doit être sans cesse élevé, par ce qui n'accédera à l'être, "dans les points d'arrivée" (Piaget), que par un élan créateur, intrinsèquement imprévisible.

Quant au fédéralisme, il est entraîné, sous un certain angle, dans la même dialectique. Certes, il y a multitude de systèmes non-fédéralistes - comme, par ailleurs, de systèmes non-prospectifs - nous en savons, hélas! quelque chose; mais la structuration de S_f, à la lumière et dans la mouvance du modèle universel, lui confère une situation, une orientation, une efficacité praxique, éminentes et au sens fort, prometteuses.

Peut-on aller plus loin et prétendre qu'il n'y a de prospective que fédéraliste? Par respect de la stricte objectivité, je n'ai pas cherché à

dissimuler les "ajustements", pour ne pas dire les coups de pouce, que commenderait une telle démarche. Et pourtant, elle reflète une part de vérité qu'il faudrait avoir le courage de mettre en lumière.

En effet, dégagé de toutes les contingences, purgé des hypothèques du passé, pro-jeté au délà des limites tracées par l'habitude, qu'est donc le fédéralisme sinon le sens même de l'histoire: c'est-à-dire à la fois signification et orientation, symbole et mouvement. Et l'histoire, quoi qu'on ait pu en penser, ne s'épuise pas dans la lutte de classes, mais bien s'exprime dans un combat incessant contre la bêtise et pour la raison, contre l'oppression et pour la libération, contre l'iniquité et pour la justice, contre la pesenteur et pour la grâce. Combat qui, dans sa violence salutaire, entraîne non seulement ce qui est collectif mais ce qui est individuel, non seulement les sociétés et les communautés mais les personnes, non seulement les destins des hommes mais le destin de l'homme. Comme je l'ai suggéré au début de cette étude, il ne s'agit pas seulement d'un mise en réciprocité du politique et de l'économique, ou du social et du sociétal: dépassant, bouleversant, accomplissant tout cela, c'est d'une mise en co-responsabilité de l'anthropologie et de la méthodologie, de la dialectique (ou métalectique) et de l'ontologie, qu'il s'agit en vérité. Déchaîner l'homme, c'est le libérer des servitudes et des contraintes injustes, mais c'est aussi déchaîner l'esprit: "Esprit, qui n'est pas seulement chiffre de la (...) syn-thèse, mais bien davantage, son ouverture et qui plus est encore, son éclatement, son essor, imprévisible, irrésistible, vers son achèvement jamais atteint"(51).

Il est certain que nos contemporains éprouvent encore un grand embarras à utiliser le vocable de fédéralisme dans un sens aussi englobant. Ce n'est pas du reste sens qu'il faudrait dire, en rigueur de termes, mais symbole ou, mieux encore, méta-bolo - ce qui n'atténue en rien la difficulté psychologique précitée! D'où la tentation constante de ramener le fédéralisme, sinon au politique "pur" tout au moins au sociétal: or, si l'on cède à cette tentation, on décapite la doctrine fédéraliste. Sur ce point, aucun compromis n'est concevable, car nous nous trouvons en présence d'une totalisation qui affronte le devenir à l'être,

et dont toute réduction vers le sectoriel, même apparement étendu, briserait inexorablement le jaillissement fondamental. Peut-être choquera-t-on un peu moins les âmes habituées en leur conseillant de substituer, de temps à autre, au vocable de fédéralisme dont les connotations les chagrinent, les agacent et les ramènent vers leur rassurante inertie, un autre terme, que ce soit, par exemple, "système f" ou S_f tout court. Si cette convention leur agrée et peut les aider à comprendre, voir à co-naître, pourquoi ne pas se montrer bon prince et grand seigneur?

On aperçoit quel pourrait être, pour l'affirmation ambitieuse qu'il n'y a de prospective que fédéraliste, un sens qui puisse se justifier. Mais il y a plus: si l'on se place résolument hic & nunc, à la pointe du présent, face au futur, alors oui, l'assertion générale perd tout caractère d'hypothèse scientifique pour devenir une fulgurante certitude, singulière: aujourd'hui, en tout cas, il n'y a pour l'humanité, pour la planète où nous demeurons, pour l'homme lui-même, pour l'esprit, il n'y a pour l'être comme pour le devenir, d'autre prospective que fédéraliste.

Certes, des futurs différents et multiples peuvent être envisagés (bien qu'ils n'aient pas de "visage humain"): massification généralisée, étatisme écrasant, destruction de l'environnement, esclavage universel, empire mondial, suicide collectif de l'humanité ...
Toutes ces "solutions" sont sans doute possibles, peut-être même probables: je ne crois pas devoir soulever beaucoup d'objections en disant qu'elles ne paraissent guère souhaitables.

Modèle de la Révolution nécessaire

On peut ajouter in fine qu'un autre modèle contribuerait à renforcer grandement les conclusions provisoires dégagées de la dialectique (ou métalectique) des trois "systèmes" considérés: je vise le modèle de la revolution. Rapidement esquissé, il se présente comme suit:

i Conformismes-réformismes: adhésion au donné;

ii Révoltes: négation ou dé-composition du donné;

iii Révolutions de la synthèse;
soumission du donné à un noveau pouvoir;

iv Révolution libératrice:
subordination des nouveaux pouvoirs au donné trans-figuré.

Entre ce modèle et les deux autres (S_f et S_p), les rapprochements, ressemblances, isomorphismes et analogies (ou analectiques) se dessinent d'emblée, surtout à la lumière du modèle universel et des deux modèles (N°s 20 et 21) de la métalectique (dialectique englobante et dialectique ouverte). Dans le présent contexte, trois observations suffiront:

- Si la prospective tronquée menace de déboucher sur l'une de ces révolutions qui se referment sur elles-mêmes, au niveau de la [iii] synthèse gouvernementale (Proudhon), et que nous qualifions, à l'accoutumée, de manquées ou de trahies, pris dans sa plénitude, S_p paraît "signifier" que le facteur normateur transcende toute révolution établie en situant dans sa visée le point d'intersection de la révolution englobante ("totale") et de la révolution ouverte: id est permanente.

- Dans la perspective de S_f, la révolution permanente n'est rien d'autre que l'exigence, toujours inassouvie et toujours plus brûlante, de participation. Ce terme se revèle, dans la dimension de la co-respondance: et du méta-dialogue, comme le couronnement, toujours inachevé ici-bas, de ce que Charles Péguy nomme communication:

"Communication, communisme ont la même, ont une commune étymologie originelle; toute étude sociale doit procéder de communication, toute étude sociale tend au comunisme; le communisme étant comme un maximum, un optimum de communication sociale". Un maximum, un optimum aussi de participation: sociale, certes, mais aussi - et du même mouvement - méthodologique, épistémologique, ontique.

- Si le fédéralisme tronqué menace de se confondre avec le réformisme (dialectique de l'aplatissement), avec la révolte (dialectique de la négation), ou avec la révolution de la synthèse (dialectique de l'enchaînement), pris dans plénitude S_f paraît "signifier", à la lumière de S_r ("système-révolution"), qu'il n'y a de fédéralisme authentique que dans le dépassement des trois niveaux précités. Dépassement qui ne saurait être réalisé qu'à la faveur d'un essor permanent au fil duquel les pesanteurs,les inerties, les déterminismes, les intérêts et les appétits sont subordonnés à l'inépuisable créativité libératrice de l'esprit révolutionnaire, que Charles Péguy, toujours lui, définit en quelques mots, d'une manière saisissante, en parlant de "ce fécond irrespect de la continuité de l'unité (homogène! A.M.) de la pensée humaine que nous nommerons proprement le sentiment révolutionnaire" (Casse-cou).

Le souffle de l'Esprit

La science n'est jamais achevée: j'ai déjà rappelé cette affirmation que l'on pourrait qualifier d'évidente si le concept même d'évidence n'était pas sujet à caution. Le savoir en général ne connaît "pas de code ultime (...), de decryptage suprême, d'herméneutique établie" (Henri Lefebvre). La recherche systémique, non plus, ne saurait prétendre à nous offrir la recette de la pierre philosophale. Toutefois, elle peut nous aider à mieux situer les problèmes et même à préparer parfois leur solution, par un [i] éclairement, une [ii] élucidation, une [iii] explicitation, une [iv] élicitation, à la fois méthodiques et irréductibles à toute formule, à toute recette, à toute méthode "pré-fabriquée". C'est ce que j'ai tenté par la confrontation métalectique des trois systèmes: fédéralisme, prospective et, tout-à-fait en bref, révolution. Confrontation conduite à la lumière du modèle universel du savoir qui n'a cessé de jouer dans cette étude le rôle de "noyau", bien que dans un sens et une perspective sensiblement différents de ceux qui ont incité P. Delattre à proposer ce terme, en le définissant d'une manière qui me paraît néanmoins suggestive:

"Le système A constitue ce que l'on pourrait appeler le noyau du système des systèmes, en ce sens que s'il exerce une influence sur les autres systèmes, il peut être étudié lui-même comme s'il était isolé. Quel que soit le nombre de systèmes en presence, leur étude peut être menée (...) de proche en proche en commençant par le noyau et en tenant compte ensuite, pour un système quelconque, des systèmes dont il dépend hiérarchiquement".

Texte qui me pousse à formuler deux remarques finales:

- Prétendre que le système appelé à jouer un rôle de noyau soit isolé paraît excessif, voire trompeur. Il se caractérise au contraire par la plus grande richesse relationnelle.

- Du reste, le modèle universel n'a pas été le seul à occuper une importante position stratégique. D'une manière plus discrète mais non moins décisive, les trois modèles dialectiques: ceux de la métalectique englobante et de la métalectique ouverte, et celui, irréalisable, de leur syntalia (accomplissement vers la perfection), n'ont cessé de jouer

un rôle comparable.

Cette dernière remarque paraît avoir été prévue par l'auteur que je viens de citer et qui nous fournit presque le mot de la fin, d'une fin toute previsoire:

"Un système de systèmes peut avoir un ou plusieurs noyaux". Un ou plusieurs, mais au minimum deux: la pensée et l'action. Or, si l'on dénomme esprit la trans-unité des deux, alors il convient d'admettre, avec Heinrich Rombach, qu'il n'y a "aucun système, aussi complexe, aussi approfondi qu'il puisse être, qui contienne l'esprit" (94 ii).

Parce que c'est l'Esprit qui con-tient tous les systèmes.

Alexandre MARC

NOTES:

(1) n° 56, p. 481

(2) n° 71 (i)

(3) n° 56, p. 24

(4) n° 3 (ii), pp. 213 s. et 231

(5) n° 71 (i), déjà cité sous (2)

(6) Anatol RAPPOPORT in n° 20, p. XXI

(7) n° 3 (ii), p. 202 s.

(8) Ibidem

(9) n° 94 (i), T.I., p. 20 n.

(10) n° 3 (ii), p. 96 s.

(11) n° 71 (i), p. 17 s.

(12) d'après "Some notions and methods" ...., Proceedings of the International Congress of Math., Cambridge, Mass., 1950, et "The theory of models", in A. Mostowki, Thirty Years of Foundational Studies, B. Blackwell, Oxford, 1966.

(13) n° 3 (ii), pp. 111 et 114

(14) Cf. Jean PIAGET, Remarques finales, in n° 3 (ii), p. 227

(15) "La planification sous le règne des influences dynamiques des systèmes sociaux complexes", in n° 56, p. 222; souligné par moi.

(16) n° 71 (i), notamment note de la p. 26

(17) Il s'agissait de l'exclusion du "concret", de tout concret: de celui, ambigu et confus, qui se situe aux origines, comme de celui, véritable, avec lequel on est confronté à l'arrivée.

(18) J. Ladriere, in n° 3 (ii), p. 55 s.

(19) Id., ibid.

(20) R. GARCIA, Ibid., p. 117

(21) Cf. à ce propos n° 110, pp. 17-19

(22) Cf. n° 76 (ii)

(23) Un livre récent (65), porte ce titre, mais j'avoue que, malgré l'effort méritoire qu'il représente, il m'a laissé sur ma faim, car il ne traite en somme, à quelques échappées près, que de philosophie sociale, politique et morale.

(24) n° 3 (ii), p. 205

(25) n° 56, p. 126

(26) Ibid., note de la page 195

(27) Ibid., p. 117

(28) Traduction libre de "... that matches the former"; cf. n° 110 p. 23

(29) Ibid., p. 25

(30) Cf. Mihajlo D. MESAROVIC, "A Mathematical Theory of General Systems", in n° 61 (ii), p. 267

(31) Ibid., notamment 11 et 12; cf. aussi n° 61 (i)

(32) In n° 20, p. 3

(33) CHURCHMAN, C.W., "The Design of Inquiring Systems", Basic Books, New York, 1971

(34) Id., n° 61 (ii), p. 434

(35) J'ai essayé de le faire, il y a des décennies, dans un manuscrit intitulé "L'Homme contre le temps" qui est resté à l'état d'esquisse

(36) n° 61(ii), p. 441

(37) n° 10, p. 270

(38) "On Future Research and its Role in the World", paper presented at the International future Research Conference, Kyoto, 1970.

(39) n° 63, p. 207; il s'agit de "post scriptum" à la deuxième édition, celle de 1970

(40) A l'exception d'un membre de phrase de J. PIAGET, emprunté à l'avant dernière page de mon livre "De la méthodologie...", tous les autres textes - de Ladrière, de Garcia, de Henriques et de Piaget - sont puisés dans le N° 3 (ii), pp. 56, 116, 187 e 231.

(41) In n° 20, p. XV

(42) Ibid., p. 19

(43) Cf. l'intéressante étude, déjà citée, de Hasan OZBEKHAN, in n° 56, p. 133

(44) D'aprés MESAROVIC M.D. (Ed.), "Views on General Systems Theory", p. 173 s., JohN Wiley, New-York, 1964.

(45) Cf. n° 21, T. I., p. 216

(46) n° 61 (i), p. 94

(47) En fait, Heinrich KOMBACH parle de structure qu'il oppose au système, sans que sa terminologie me paraisse s'imposer. Cf. n° 94 (ii)

(48) Cf. "A Wattled Theory of Systems", in n° 61 (ii), p. 290 Les quelques mots empruntés à John H. Miloum figurent dans son étude "The Hierachical Basis for General Living Systems", ibid. cf. p. 158 et aussi p. 183

(49) n° 71 (ii), p. 40

(50) Cf. Michel MASSENET, "La politique extérieure d'une Europe unie", p. 9, Futuribles, Paris, 1964.

(51) n° 71 (i), p. 80

(52) n° 30 (ii), p. 115

BIBLIOGRAPHIE

Les quelques ouvrages qui sont mentionnés, ci-dessus, ne constituent pas une bibliographie scientifique: il s'agit de textes, soit utilisés par moi, directement ou non, soit, pour la plupart, cités dans les pages qui précèdent.

A ma connaissance, il n'existe pas de bibliographie complète de la méthodologie générale. On trouvera d'utiles références dans certains des ouvrages cis-dessous, notamment américans, et aussi dans le remarquable volume de l'Encyclopédie de la Pléiade, publié chez Gallimard, sous la direction de Jean Piaget.

1. ALARCOS LLORACH (E.), Alexandre (P.), Austerlitz (R.), etc. (sous la direction de MARTINET (A.) - Le Langage. "Encyclopédie de la Pléiade", Paris, Gallimard, 1968.

2. ALLIOT (M.), BASTIDE (R.), BLOCH (M.), etc. (sous la direction de POIRIER (J.) - Ethnologie générale. "Encyclopedie de la Pléiade, Paris, Gallimard, 1968.

3. (i) APOSTEL (L.), GRIZE (J. B.), PAPERT (S.), PIAGET (J.) sous la direction de PIAGET (J.) (i) La Filiation des structures. Paris, Presses universitaires de France. "Bibliothèque scientifique internationale", 1963.

3. (ii) APOSTEL (L.), CELLERIER (G.), DESANTI (J.T.), GARCIA (R.), etc. PIAGET (J.), etc. (ii) L'Explication dans les sciences, Flammarion, Paris, 1973

4. AUGER (P.), R.P. DUBBARLE (D.), GONSETH (F.), HUNLEY (J.), etc. - Science et synthèse, Paris, Gallimard, 1967.

5. AUZIAS (J.M.) - La Philosophie et les techniques. Paris, Presses universitaires de France, 1965.

6. BACHELARD (G.) - L'Experience de l'espace. Paris, Librairie Felix Alcan, 1937.
- Le Nouvel Esprit scientifique, Paris, F. ALCAN, 1934.
- Dialectique de la durée, Paris, Boivin, 1936.
- La Formation de l'esprit scientifique, Paris, Presses universitaires de France, 1937.
- Le Rationalisme appliqué, Paris, P.U.F., 1949.

7. BADIOU (A.) - Le Concept de modèle. "Cours de philosophie pour scientifiques", Paris, François Maspero, 1967-68.

8. BENOIT (J.M.) - Marx est mort. Paris, Gallimard, 1970

9. BENVENISTE (E.), CHOMSKY (N.), JAKOBSON (R.), etc. - Problèmes du langage. Collection "Diogène", Paris, Gallimard, 1966.

10. BERGER (G.) - Phénoménologie du temps et prospective, P.U.F. Paris, 1964.

11. BIOT (J.), COSNIER (J.), FOLLIET (J.), etc. - Le Dialogue. Collection "Convergences", Paris, SPES, 1967.

12. BLANCHE (R.) - L'Axiomatique. Paris, Presses universitaires de France, 1967.
- La Science actuelle et le rationalisme. Paris, Presses universitaires de France, 1967.
- Introduction à la logique contemporaine. Paris, Armand Colin, Collection "U2", 1968.

13. BLONDEL (C.), de BROGLIE (L.), HADAMARD (J.), etc. - L'Invention. (Neuvième semaine internationale de synthèse). Paris, Librairie Felix Alcan, 1939.

14. BOIREL (R.) - Théorie générale de l'invention. Paris, Presses universitaires de France, Collection "Philosophies contemporaines", 1961.

15. BOLE (M.) - Les Certitudes du hasard, Paris, Presses universitaires de France, Collection "Que sais-je?," 1941.

16. BON (F.), BURNIER (J.A.), CUISENIER (J.), DESANTI (J.), etc. (sous la direction de Noiray (A.) - La Philosophie. "Les Dictionnaires du savoir moderne", Paris, Denoël, 1969. England, Cambridge University Press, 1953.

17. BOUDON (R.) - A quoi sert la notion de "Structure"? Paris, Gallimard, 1968.

18. BRAITHWAITE (R.B.) - Scientific Explanation. Cambridge

19. de BROGLIE (L.) - L'Avenir de la science, Paris, Plon, Collection, "Présences".

20. BUCKLEY (W.) (edit.) - Modern Systems Research for the Behavioral Scientist, Aldine Publishing Co., Chicago, 1969.

21. BUNGE (M.) - Scientific Research, I et II, Springer-Verlag Berlin-Heidelberg-New York, 1967.

22. CARNAP (R.) - Logical Foundations of Probability, Chicago, Ill. University of Chicago Press, 1950.

23. CAUDE (R.), MOLES (A.), etc. - Méthodologie, Vers une science de l'action, Paris, Gauthier-Villars, 1964.

24. CHAO (Yuen Ren.) - Langage et systèmes symboliques. Paris, "Bibliothèque scientifique", Payot, 1970

25. CHURCHMAN (C.W.). - The Design of Inquiring Systems. Basic Books, New York, 1971.

26. COHEN (M.R.), NAGEL (E.). - An Introduction to Logic and Scientific Method, New York, Harcourt, Brace, 1934;

27. COHN (J.) - Theorie der Dialektik, Formenlehre der Philosophie, Leipzig, Felix Meiner Verlag, 1923.

28. COUDERC (P.) - La Relativité, Paris, Presses universitaires de France, Collection "Que sais-je?", 1941.

29. DANTO (A.), MORGENBESSER (S.) (eds.) -- Philosophy of Science. New York, Meridian Books, 1960.

30 (i) DELAITRE (J.P.). - L'évolution des systèmes moléculaires, Maloine-Doin, Paris, 1971.

30 (ii) DELATTRE (J.P.) - Système, structure, fonction, Maloine-Doin, Paris, 1973.

31 DESANTI (J.T.). - Les Idéalitiés mathématiques. Paris, Le Seuil, 1968.

32. DIEMER (A.). - Der Wissenschaftsbegriff (collect.), Verlag Anton Hain, Meinseheim am Glan, 1970.

33. DUCROT (O.), TODOROV (T.), SPERBER (D.), SAFOUAN (M.), WAHL (F.);- Qu'est-ce que le structuralisme? Paris, Le Seuil, 1968.

34. ELLUL (J.). -- La Technique ou l'enjeu du siècle. Paris, Librai Armand Colin, 1954.

35. EMERY (F.E.). - Systems thinking, Penguin Books, Harmondsworth and Baltimore, 1969.

36. ESPRIT, numéro spécial (11): La Pensée sauvage et le structuralisme, novembre 1963.

37. ESSLER, (W.K.). - Wissenschaftstheorie, I et II, Verlag Alber, Freiburg/München, 1970.

38. FAURE (R.) BOSS (J.P.), LE GARFF (A.). - La Recherche opérationelle. Paris, Presses universitaires de France, Collection "Que sais-je?", 1967.

39. FEIGL (M.), BRODBECK (M.) (eds.) - Readings in the Philosophy of Science. New York, Appleton-Century-Crofts, 1953.

40. FICHAUT (M.), PECHEUX (M.), - Sur l'histoire des sciences. Paris, François Maspero, 1967-68.

41. FRANCK (P.). - Philosophy of Science. Englewood Cliffs, N.J., Prentice Hall, 1957.

42. FRIEDMAN (G.). - Sept Etudes sur l'homme et la technique. Paris, Editions Gonthier, 1966.

43. FOULQUE (P.). - Dictionnaire de la langue philosophique. Paris, Presses universitaires de France, 1962.

44. GADAMER (H.G.). - Wahrheit und Methode. J.C.B. Mohr (Paul Siebeck), Tübingen, 1965 (2. Auflage).

45. de GANDILLAC (M.)., GOLDMANN (L.), PIAGET (J.). - Entretiens sur les notions de genèse et de structure. La Haye, Moutnn, 1965.

46. GARCIA (R.) - L'explication en physique (L'Explication dans les sciences) - Flammarion, Paris, 1973.

47. GILSON (E.). - Linguistique et Philosophie. Paris, Librairie philosophique, J. Vrin, 1969.

48. GOODMAN (N.). - Fact, Fiction and Forecast. Cambridge, Mass., Harvard University Press, 1955.

49. GRANGER (G.G.). - Pensée formelle et sciences de l'homme. Paris, Aubier, Ed. Montaigne, Collection "Analyse et raison", 1967.

- Méthodologie économique. Paris, Presses universitaires de France, Collection "Bibliothèque de philosophie contemporaine", 1955.

- Essai d'une philosophie de style. Paris, Armand Colin, 1968.

50. GUILLAUME (G.). - Langage et science du langage. Paris, Librairie A.G. Nizet, Québec, Presses de l'Université Laval, 1964.

51. GUSDORF (G.). - Les Sciences humaines et la Pensée occidentale. Tome I: De l'histoire des sciences à l'histoire de la Pensée. Paris, Payot, 1966. Tome II: Les origines des sciences humaines, Paris, Payot, 1967.

52. HANSON (N.R.). - Patterns of Discovery. Cambridge, England, Cambridge University Press, 1958.

53. HEISS (R.). - Die grossen Dialektiker des 19 Jahrhunderts: Hegel, Kierkegaard, Marx, Kiepenheuer & Witsch, Cölogne, Berlin.

54. HEMPEL (C.G.). - Fundamentals of Concept Formation in Empirical Science. Chicago, Ill., University of Chicago Press, 1952.

55. JACOB (A.). - Temps et langage. Paris, Librairie Armand Colin, 1967.

56. JANTSCH (E.). - coll. Prospective et Politique, Organisation de Coopération et de Développement Economique, Paris, 1969.

57. JOLIF (J.Y.). - Comprendre l'homme. Tome I: Introduction à une anthropologie philosophique. Paris, Les Editions du Cerf, 1967.

58. de JOUVENEL (B.). - L'art de la conjecture, Futuribles-Sédéis, Paris, 1972.

59. KAHN (H.), BRIGGS (B.B.). - A l'assaut du futur, Robert Laffont, Paris, 1973.

60. KAUFMANN (A.). - L'Homme d'action et la science. Paris, Hachette, Collection "L'univers des connaissances", 1968.

61. KLIR (G.J.). (i) An Approach to General Systems Theory, Van Nostrand Reinhold Co, New York, 1969

(ii) - Trends in General Systems Theory, New York, Wiley-Interscience, John Wiley and Sons, 1972.

62. KOURGANOFF (V.). - La Recherche scientifique, Paris, Presses universitaires de France, Collection "Que sais-je?", 1965.

63. KUHN (Th. S.). - The structure of Scientific Revolutions, Second ed. Vol. II, The University of Chicago Press, 1970.

64. LALANDE (A.). - Vocabulaire technique et critique de la philosophie. Paris, Presses universitaires de France, 1968.

65. LANG (K.). - Die philosophie des Föderalismus, Zurich, 1971.

66. LEFEBVRE (H.). - Logique formelle, logique dialectique, Paris, Editions Anthropos, 1969.

67. LE MASSON (R.). - Philosophie des nombres, Paris, Desclée DE BROUWER & Cie, 1932.

68. LEROI-GOURHAN (A.). - Le Geste et la parole. Technique et langage. Paris, Editions Albin Michel, 1964.

69. MADDEN E.H. (ed.). - The Structure of Scientific Thought: an Introduction to Philosophy of Science, Boston, Mass., Houghton Mifflin, 1960.

70. MALMBERG (B.) - Les Nouvelles Tendances de la linguistique. Collection "SUP", Paris, Presses universitaires de France, 1968.

71. MARC (A.) (i) - De la méthodologie à la dialectique, Presses d'Europe, Paris, 1970.

(ii) - Dialectique du déchaînement, Fondements philosophiques du Fédéralisme, collection Réalités du Présent, La Colombe-Presses d'Europe, Paris, 1961.

72. MARCUSE (H.). - L'Homme unidimensionnel. Paris, Edit. de Minuit, 1968.

73. MARTIN (R.). - Logique contemporaine et formalisation. Paris, Presses universitaires de France, 1964.

74. MARTINET (A.). - Au sujet des fondements de la théorie linguistique de Louis Hjelmslev. Paris, Republications Paulet, 1968.

75. MASSENET (M.). - La politique extérieure d'une Europe unie, Futuribles, Paris, 1964.

76. MESAROVIC (M.D.). (i) - Views on General Systems Theory, John Wiley, New York, 1964.

MESAROVIC (M.D.), MACKO(D), TAKAHARA (Y.) (ii) Theory of hierarchical, Multilevel Systems, Academic Press, New York-London, 1970.

77. MEYERSON (E.). - De l'explication dans les sciences. Paris, Payot, 1921.

78. MOLES (A.A.). - La Création scientifique, Genève, Ed. René Kister, 1957.

79. MOULOUD (N.). - Les Structures, la recherche et le savoir. Paris, Payot, "Bibliothèque scientifique", 1968.
- Langage et structures. Paris, Payot, 1969.

80. MUCCHIELLI (R.). - Introduction à la psychologie structurale, Bruxelles, Charles Dessart, 1966.

81. MUMFORD (L.). - Technique et civilations. Paris, Le Seuil, 1950.

82. NAGEL (E.). - The Structure of Science. New York, Harcourt, Brace & World, 1961.

83. OPPENHEIMER (J.R.). - L'Esprit libéral. Paris, Gallimard, 1967.
- La Science et le bon sens. Paris, Gallimard, 7e édition, 1955.

84. ORTIGUES (E.). - Le Discours et le symbole. Paris, Aubier-Montaigne, 1962.

85. PACOTTE (J.). - La Connaissance. Paris, Librairie Félix Alcan, 1934.

86. PAP (A.). - An Introduction to the Philosophy of Science. New York, Free Press of Glencoe, 1962.

87. PIAGET (J.). - Sagesse et illusions de la philosophie. Paris, Presses universitaires de Frances, Collection "A la pensée", 1968.
- Le Structuralisme. Paris, Presses universitaires de France, Collection "Que sais-je?", 1968.
- Epistémologie et psychologie de la fonction. Paris, Presses universitaires de France, "Bibliothèque scientifique internationale", 1968.
- Logique et connaissance scientifique. Paris, Gallimard, "Encyclopédie de la Pléiade", 1967.
- La Psychologie de l'intelligence. Paris, Armand Colin, Collection "U2", 1967.

88. POINCARE (H.). - La Valeur de la science. Paris, Flammarion, 1920.

89. POIRIER (R.). - Le Nombre. Paris, Librairie Félix Alcan, 1938.

90. PONASSE (D.). - Logique mathématique, Paris O.C.D.L., 1967.

91. POPPER (K.R.). - The Logic of Scientific Discovery. London, Hutchinson, 1959 (dont il existe une nouvelle édition).

92. QUINE (W.V.).- From a Logical Point of View. Cambridge, Mass., Harvard University Press, 2nd edition, 1961.

93. ROBERT (P.). - Dictionnaire Petit Robert. Paris, Sté du Nouveau Littré, 1967.

94. (i) ROMBBACH (H.). - Substanz, Systems, Struktur, 2 vol., Verlag Karl Alber, Freiburg/München, 1965.

94(ii) - Strukturontologie, Karl Alber, Freiburg/München, 1971.

95. ROURE (M.L.). - Eléments de logique contemporaine. Paris, Presses universitaires de France, 1967.

96. RUSSEL (P.).- Human Knowledge. New York, Simon and Schuster, 1948.

97. SCHEFFLER (I.). - Anatomie de la science, Etude philosophique de l'explication et de la confirmation. Paris. Le Seuil, Collection "Science ouverte", 1966.

98. SCHERER (R.). - Structure et fondement de la communication humaine. Paris, Sté d'Edition d'enseignement supérieur, 1965.

99. SCHOLZ (H.). - Esquisse d'une histoire de la logique. Paris, Aubier-Montaigne, Collection "Analyse et raisons", 1968.

100. SCHOLZ (H.) und HASENJAEGER (G.). - Grunzüuge der mathematischen Logik, Berlin, Göttingen, Heidelberg, Springer Verlag, 1961.

101. SERRUS (Ch.). - La Langue, le sens, la pensée. Paris, Presses universitaires de France, 1941.

102. SIMONDON (G.). - Du mode d'existence des objets techniques. Paris, Aubier-Montaigne, Collection "Analyse et raison", 1958.

103. STEGMÜLLER (W.). (i) - Wissenschaftliche Erklärung und Begründung, V. I, Springer Verlag, Berlin-Heidelberg - New York, 1969.

(ii) - Theorie und Erfahrung, V. II, Springer Verlag, Berlin-Heidelberg-New York, 1970.

104. VAN COURT (H.) Jr. - L'analyse des systèmes, Dunod, Paris, 1972

105. VIET (J.). - Les Méthodes structuralistes dans les sciences sociales. La Haye, Mouton, 1965.

106. VIRIEUX-REYMOND. - L'Epistémologie. Paris, Presses universitaires de France, Paris, 1966.

- La Logique formelle. Paris, Presses universitaires de France, 1967.

107. VUILLEMIN (J.). - Leçons sur la première philosophie de Russell. Paris, Librairie Armand Colin, 1968.

108. WAHL (J.). - Traité de métaphysique. Paris, Payot, 1968.

109. WEINGARTNER (P.). - Wissenschaftstheorie, I, Fromman-Holzboog, 1971.

110. WHYTE (L.L.), WILSON (A.G.), WILSON (D.). - Hierarchical structures, American Elsevier Publishing Co, Inc., New York, 1969.

An Account of Explorations in the Wild and Undefined Territory Called Simulation Gaming, Lying Between Behavioral Science, Dramatic Art and Educational Technique

INFORMAL REPORT

By Richard Meier
Professor of Environmental Design,
University of California, Berkeley

It was the prospect of hard times that impelled me to undertake responsibility for promoting and managing a grant intended to develop the potentials of gaming simulation. Graduate students in city planning and, to a lesser extent, architecture, were faced with losing their primary sources of support while studying. The Governor and State Legislature, in an attempt to get at some of the organizing strength behind the rebellions in the University, had cut back teaching assistantships to about a third, and out-of-state tuition waivers were reduced even more. Simultaneously the foundations providing fellowships and scholarships had given notice, for altogether different reasons, that they were withdrawing from that activity. It was therefore the duty of every faculty member to come to the support of his School!

The kinds of conditions described above have now descended upon almost every community in Academia, but four to five years ago in Berkeley they appeared to be unique affecting that institution and the associated campuses, which had been treated similarly even though less belligerant. We could only foresee other schools with fellowships and assistantships attracting the best students while we were left with a group that had been picked over carefully to which were added a few that had been

born rich and liked the climate. To avoid those restrictions upon the forthcoming academic cohorts, those who did research went out after grants, while those that organized communities or were engaged in professional practise sought other kinds of niches supportive for students.

I had been one of the first explorers in the territory of simulation gaming. That was before a name had been assigned to the area. No one holding the purse strings to grant money could understand the rewards that were offered when I first tried to organize an expedition -- so it was bootlegged. We promised NSF that a promising young assistant professor would acquire experience in educational technique, but instead he explored out beyond its boundaries. Similar bootlegging was done for the area of behavioral science. My own motivation was that of seeking to learn more about organization theory, and it appeared that tests of some of the newest models lie in the manipulation of people's behavior according to principles to be found in the area that later came to be called gaming simulation. By 1968 the interest in organization theory had carried me to a set of its largest scale future problems -- the creation and management of the ten-fold expanded urbanism needed over the next century -- which could only be studied efficiently in Asian metropolises. Although I could get personal support for expeditions to investigate Asian metropolitan social systems, there was no provision for students. Actually more than 90% were actively disinterested, due to the failure of the American policy for intervening in the affairs of Viet Nam. By that time, the potentials of simulation gaming had come to be known by an avant garde, so it might be possible to gain support for a circle of adventurous city planning and design students. Knowledgeable persons could be drawn upon as references. Perhaps -- it was barely possible -- the connections between

future metropolitan organization and gaming simulation could be explored in the process. So I assembled a group of like-minded faculty, reviewed our backup in local expertise, and negotiated for a joint enterprise with the Ann Arbor group, whose purposes for the development of simulation gaming were quite different. Fred Goodman's intent, for example, was to claim the territory as a natural extension of educational technique. We all thought that such an outcome was the manifest destiny of the area.

The subsequent period turned out not to be as it appeared earlier. Foundations relented, and provided terminal grants. Students won prizes in competition based upon their own performances, and a number of small opportunities came to hand. City planning had never been so affluent. The adventurous students were not hungry enough to join us at the time the project was launched. A transfer from Ann Arbor, who did not even register as student, was all we could muster in the beginning. Then architects began to be attracted, despite their inexperience with human organization. I had hopes for finding a person who would specialize in the study of gaming simulation, to whom I could gradually transfer responsibility, but such people appeared too late to help. I had to look around for talent wherever it was to be found -- library science, mathematics, non-students, even trying the business school. Toward the end of the project, when we were preparing the finished working models for use by others, an accounting error in the backup administration caused me to overcommit the available resources by a considerable margin. When the error was found, I had to disband the crew with no notice, stripping down to an absolute skeleton staff, and establish minimum loss priorities. Fortunately it was possible to bootleg again, so that the services of the key man could be obtained by trading a piece of computer peripheral equipment from another project. The problem of holding an inventory of

published games could not be resolved so readily, so I committed $5,000 from personal income to maintain the momentum. This is a violation of the unwritten rules of academic research, but it was necessary to prevent much greater losses.

The Learning That Comes from Doing

Once the undertaking had been launched it began to appear that the greatest need was the establishment of a small community of local gaming simulation enthusiasts. A focus was started for socializing, a mailing list begun, the independent non-academics contacted, reinforcements were sought from education and psychology, and notices began showing up on the walls; a summer session was organized around the theme, as were several extension courses, and several studios in planning and architecture were infiltrated. A gaming culture soon developed among its enthusiasts, but the rapid turnover in professional schools and their social milieu prevented any speedy kindling of a steady flame useful for exerting a force for change. Only now are the assistant professors asking about acquiring a repertory of a half dozen assorted games, but we no longer have the facilities to transmit the knowhow and experience cheaply. I doubt whether many of them can afford the time that would be required to start almost from scratch. Yet there seems to be hope that the flickering flame will stay alive. Reports from the East indicate that public demand for participation exercises, among which simulation games are the most highly structured, is greater by far in Western America than anywhere else in the world. Much of the ground we explored in simulation gaming is being rediscovered by others who are just now finding out that we have surveyed the territory. Most of the new attempts are by people spurred on by the need to solve

special problems which lead them to explore commercial rather than academic channels for distributing what they have assembled. However, the presence of so many amateurs ruins the business, so there is no money to be made from commercial exploitation until addictions to games are found that have the strength of gold fever and tobacco smoking at the time of the colonization of the New World. Later in this report it will be shown that such potentials exist, and may yield a notable profit in a decade or so. When a half dozen or so of the independent enthusiasts accidentally find each other and mobilize the resources available to each of them, a gaming culture can be established on a firmer footing even than that created in Ann Arbor, but the odds are at least even that such a company of adventurers and developers will find a base elsewhere than at Berkeley.

An important share of my own creative energies have gone into exploring the connection between future urbanization and simulation models of community. The FOMENTO model had been described with words in my book Developmental Planning (1965) but somehow the core of the argument was not being transmitted to planners. The gap between logical, even pragmatic, principles and real decision making in a political context was too great. Simulation gaming explorations in the company of three advanced students were tried, but failed to make progress. Trying again with a class of twenty working on the future of Bombay, we registered a fair success. Perhaps forty per cent of the students caught on to the significance of the underlying model. The following year, taking up Bombay again after I had visited there with results from the first run, more than half seemed to have caught the idea and enthusiasm for the technique ran very high. However I detected that only the most Americanized of the participants from overseas had acquired the essentials of the

FOMENTO model which their participation had energized and made to work. In 1973 a stripped down model on the future of Saigon was run by a former student, now teaching in Wisconsin, while I undertook to superimpose it upon the future of Jakarta. In each succeeding instance the investment of time involved in the "production" of FOMENTO has been reduced by half, but it is still too expensive to mount routinely. Moreover, it seems to be much more suited to American styles of cooperation and learning than to those most commonly found in the elites of developing countries. The latter are much more comfortable with authoritative statements made with charisma and dramatic art than with learning-by-doing role-playing exercises, even if the latter are strongly regulated by pre-set rules-of-the-game. I will be noting gaming behavior among the educated classes in the Orient as one of the objectives of a sabbatical tour in 1974. Perhaps adaptations and compromises can be found.

The Frontier with Dramatic Art

Simulation gaming is drama in which the actors are simultaneously also the audience. The actors "write" the script as they proceed, with only the first act plotted in advance. Wardrobe and props are reduced to identification tags and pieces of paper and plastic to expedite transactions. The director is a referee, judge, producer, and general trouble shooter. The stage and auditorium have disappeared altogether, replaced by a bare room with tables, chairs, with wall charts sometimes required. Rehearsals are reduced to a few minutes or dispensed with completely. It is only the sense of play acting that is fully retained -- it is not part of the real world but only a game with symbolic gains and losses -- yet gaming simulation is serious in that it maps or portrays problematic situations found in history or on the contemporary scene.

The loss of the atmosphere that teased the imagination of the playgoer into believing that he had been transported into another world and another time is made up for by the need to engage with others in the action.

The critics of the performance are again the players, who are forced to think on several planes as they review events that were enacted and their potential significance. One of these is at the level of purely personal experience. How does one cope with the confusions created by the role he took on? What would be done differently, if there were a second chance? Another plane is that of assessing a total situation, together with its milieu and its ordering of personal transactions. What is going on at the small group and total assembly levels that will attach meaning or value to specific behavioral options? How does the larger context affect the interpersonal bargaining process? Still another plane recognizes parallels and analogs with the real world and therefore suggests to the player a new range of strategies and outcomes that may apply whenever this context arises in the real, non-trivial world. This plane considers the simulation game to be what the term says it is -- a model of some competitive-cooperative aspect of reality -- and judges the validity of the model as compared to others that exist. Every underlying model is, by definition, finite so that it must fail in most contexts in order to fit some. The limits of applicability are best set as a consequence of discourse among critics.

Two unique roles in the production of drama have been retained -- the game designer and the game director. The game designer contributes some ingenious contextual twists of his thinking that enables him to strip away the trite and obvious and get across a point of some kind to

players of roles. He finds ways of intriguing people so that they will enter a situation in which their behavior is guided by certain limited objectives (e.g. goal achievement, score maximization, domination) and constrained by a set of rules. A participant hopes to "acquire experience." and perhaps see himself and his capabilities in a new light, as a result of engaging in the simulation exercise. Each game designer goes through an improvement cycle in which he observes, listens to reports, and fiddles with the rules, props, context, pace of interaction, and the payoffs. His aim is to minimize the confusion that is necessarily at a high level due to the participation of amateurs and enhance the overall effect. His artistic skills must resemble those of a playwright or a musical composer but it is less important for him to dominate the expression of the individual players. Those who play many games often consider creating a new game, but very few succeed in designing one that other people will undertake to play.

The game director is usually a producer as well as a pacemaker, coach, referee, arbitrator, and often an equipment supplier as well. His primary skills are those of manipulation of groups of people. Normally a game director will build up a repertory of games and simulations he is able to produce. If a computer backup to the game is required, a large share of his task is to overcome problems presented by the interface between the computers and the players.

I could have described gaming simulations using the precise terms evolved over twenty five hundred years of organized theatre, or the vivid language evolved in more than a century of team sports by the columnists and critics, but gaming simulation at its present stage of development does not deserve it. It is crude, primitive, clumsy, and

unrefined as compared to the established professional arts. It has only youth and potential; it gains critical success only when compared to sensitivity training and other unstructured group processes. Yet it is a medium that should soon attract highly competent artists.

How might such an artist function in American society? I imagine such a person with his agent-assistant as being on tour, much the way a monologist is. He is likely to get started on the campus circuit first because the university publicity process will handle novelties with facility. Presentations would be interspersed with short courses either by university extension or as studios and laboratories attached to standard courses, similar to the way that dramatics is attached to the speech or rhetoric departments. The courses would allow a person to train a number of local practitioners and thereby multiply his effect and increase revenues. The repertoire might include one gaming simulation based upon history, one upon community issues, one concerned with some aspect of "future shock," one based upon pattern recognition and language development and perhaps one that draws upon abstractions suggested by the other professionals and illustrates best the principles of gaming simulation technique.

The greatest difficulty a person will have is in finding a suitable place to conduct simulation games. The best place we have found is the lounge associated with a student-designed and operated snack bar. It is possible to introduce slides and film strips easily and control lighting. The walls are readily papered or hung with tapestries or blackboards which create effect or expedite transactions. It appears that the design of small part-time eating places will follow this trend, so that without explicit planning, decent places for handling groups of

20-40 persons seem likely to come into being. New libraries often contain "multi-purpose rooms" which are almost as adaptable. Typical presentations will run from two to six hours, and sometimes be halted in the evening with a finale the second day. The intense, accelerated, learning-by-doing experience that can often be created palls after that for almost all people; long and drawn out gaming simulations lasting a week, or continued weekly for a full semester, are suitable only for the enthusiasts who have already become addicted to this means of acquiring personal experience.

Once the artists have colonized the territory of simulation gaming, and the one-in-a-million level of aptitude is called to the practise of the art, several further adaptations may be expected. One of them is the formation of a circle of journalist-critics who will invent a meta-language for coping with the phenomena. Another will be the creation of retreats or centers, similar to Bethesda, Maine, and the Esalen centers for sensitivity training, to which the initiates will repair. Out of these retreats will spring several different concepts for ideally constructed environments, so that programs can be written for architects asked to produce designs, patrons for this extension of the dramatic arts can be found, and the newest temples for dramatic arts -- the theater complexes -- will add an extra set of activities and new groups of devotees. By such means artistic invention -- the systematic capture of intuitive flashes followed by their reduction to practise -- is institutionalized.

The Massive Takeover by Educational Technique

Educators are a numerous clan and much subject to fads and enthusiasms which they talk about a great deal but which affect the institutions of educational technique very slowly. Basically education

is a conservative force in modern society, and educators divide into two main camps: the conservationists and the preservationists. The former talks a great deal about human resource potentials and the need to develop them for a post-industrial world, the latter about maintaining basic standards needed for a democratic social system.

The post-industrial transformation of modern society has a logic and a momentum which requires extensive experimentation and adaptation. Two directions in particular require new approaches to education and training. The most complex of these is the transfer of productive activity (measured by the value added after the combination of labor, capital, land, and knowledge for the supply of a useful service) from the farm, mine, and factory to public bureaucracies containing many specialists who require credentials from teaching institutions. They are joined by a huge variety of small enterprises and voluntary groups engaged in the supply of human services. In quite another dimension society encounters the insistence of women that opportunities for full participation in such activities by granted to them, not merely in secretarial work and elementary school teaching. Child bearing and child rearing has been reduced from a life-time career to a minor interval, or even episode, in a full life. The post-industrial era has really arrived for only about 5-10% of the Americans (much fewer elsewhere), but it is taking over and the trend to multiple careers and lifelong education seems inevitable. One needs only to estimate the lag in the adjustments made by the educational establishments to discover the dimensions of expansion ahead.

In the heartland of educational technique they argue about academisms -- such things as the best way to teach elementary economic theory, usually forgetting that virtually all of it treats ideal cases

that are utterly unrealistic. The frustrations caused by this academic outlook lead the returnees to the educational system, hoping to get guidance for the next career change, to go into a search pattern for more appropriate problem-solving behavior; they will demand a closer approximation to reality. Simultaneously the agencies that are recruiting new members cannot handle the mob of visitors, applicants, apprentices, and curiosity seekers. The obvious solution is a substitute for contact with the real organization -- a tour conducted through simulation gaming. It provides contact with the local jargon, and a condensed overview of the working sub-system. Serious people will know much better how to proceed from there; the romantics will have been shocked out of their sentimental attachment.

The tour agents may be the training divisions of the growing agencies, because the bureaucratic agencies now assume responsibility for personnel development as well as selection and orientation. They can also be the universities and special teaching institutes that are expected to serve the public in general. Increasingly the agencies will contract with the latter.

Gaming simulations are best suited for brief, concentrated experiences. Each agency will have to keep preparing new models of itself as it sees itself participating in a larger system. Thus the firm prepares the model of oligopolistic competition with built-in risks to which it is subject, and the agency formulates the strategies for maintaining a clientele or constituency that will back it up in a political battle that affects budgetary support. Both are dressed up to look either more academic or more idealistic (i.e. human service-oriented), but the important feature is that they are closer approximations of reality than published textbooks.

The principal use of the kind of simulation gaming ~~trips~~ types we know today is the very short course -- from a weekend to two weeks, where it would become a major component. For a longer course, the object may become the renovation of such a simulation or even the synthesis of a better model, although the latter effort usually must be accompanied by extensive, systems-oriented research. In the long run the rapidly diminishing cost of computing and telecommunications will bring into view some new resources in the territory of simulation gaming that will attract educators and students but at the moment these appear to be utter fantasy.

Subversion from Behavioral Science

At the moment a chasm separates simulation gaming from behavioral science. In behavioral science one sees orderly pre-planned experiments, designed so as to obtain reproducible results. Noise in the environment is reduced to a minimum. The inhabitants of this realm have the aim of building an edifice of knowledge -- a megastructure capable of infinite extension rather than a ziggurat tower of Babel. There is still relatively little superstructure in behavioral science, despite lofty ambitions, because the leaders seem to be continually directing work toward establishing new foundations.

The behavioral scientists have perfected intellectual apparatus for analysis of some of phenomena observable in simulation gaming. They can, for example, measure the relative closeness of fit of a simulation to the underlying reality. They can also dissect the game characteristics and for some simple situations identify normal choice-making behavior as well as optimum strategies. A few reports are available from the scouts that have been sent out.

What dismays behavioral scientists about simulation gaming as it exists today is the incredible sloppiness of organization. Rule breaking

is hardly frowned upon at all; too often it is even encouraged so as to create novel situations. Behavioral scientists prefer to take their novelty in bite size quantities and then only one or a few at a time. They are willing to move across the chasm only to places where simulation gamers promise to be more disciplined, and even then they insist upon bringing over their own tools and performance standards from the models that are constructed.

Simulation gaming will join with behavioral science quite soon, however, in order to exploit the resource provided by public television distributed by cable and the opportunities presented by small, cheap computers. Unpublished reports from the first field explorations indicate that the public's attention can be held by very few of the standard techniques. In fact only two are reported to work in a majority of locales -- a low-key actor-announcer introducing the in-built action of the community and simple games, such as Bingo. It appears that the younger viewers will graduate to more sophisticated gamed interaction, such as a model of an anti-ballistic missile system (Space War) that is now invading the juke box market and pin ball market.

However the challenge is now apparent, that specialized audiences, amounting to several per cent on a Nielsen rating, can become as thoroughly addicted to continued gaming as the clique that is devoted to soap opera. The challenge is to find intellectual processes that employ digital and analog channels (television, videotape, telephone, computer) that fit into the real world. Most will be abstract games with only the slightest hint of simulation. However those who become adept at such games, learning about optimum strategies, will often invent a simple ploy which will destroy existing models in the territory of simulation

gaming. Replacement models must take that ploy, and the prior behavioral science theory into account. More often the ploy is introduced directly into the real world, which must then pass a law against it, or find a counter-ploy, in order to achieve a new steady state. The gaming simulation model is accordingly revised to reflect the new state of affairs. As these adaptations become necessary, salesmen and small entrepreneurs from the area of behavioral science will appear on the scene peddling software. Purchase and use of the software introduces an invisible interface to which more software can be added.

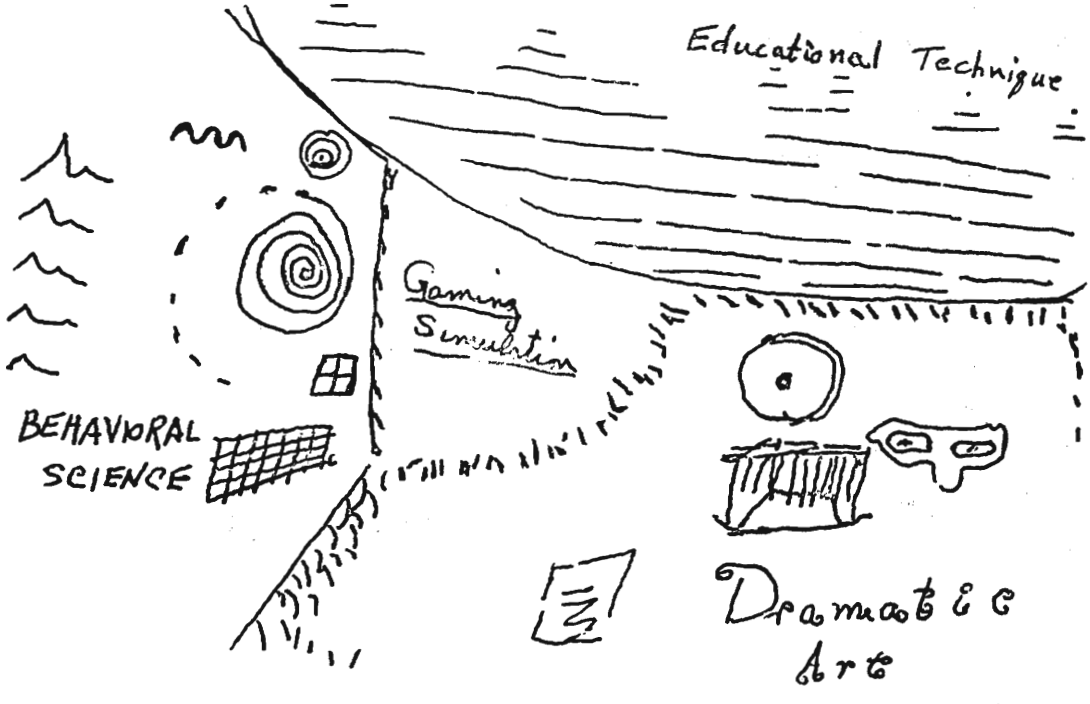
The changes introduced from the linearized, metrical regions of behavioral science are rarely ballyhooed. They occur always behind the scenes or under the surface. It can be argued that they are more fundamental than the others. Certainly their work will allow a wider range of working models of human organization and allow them to be operated by a much larger portion of the human population. A fair share of the revolutionary ideas generated by behavioral science (most humanist scholars will grant that the effects are more profound than those arising from nuclear physics or molecular biology) will exert their influence initially through gaming simulation models.

SIMULATION GAMING

NOTE

This is the product of three days thinking and writing undertaken to describe a) how I came to be involved, b) what is the present state of the art, and c) what could be the future of the area? It does not contain explanatory footnotes, which would justify many apparently arbitrary assumptions and assertions. They derive from at least a decade of interactions with circles of colleagues, which are treasured and provide a large share of the infra-structure.

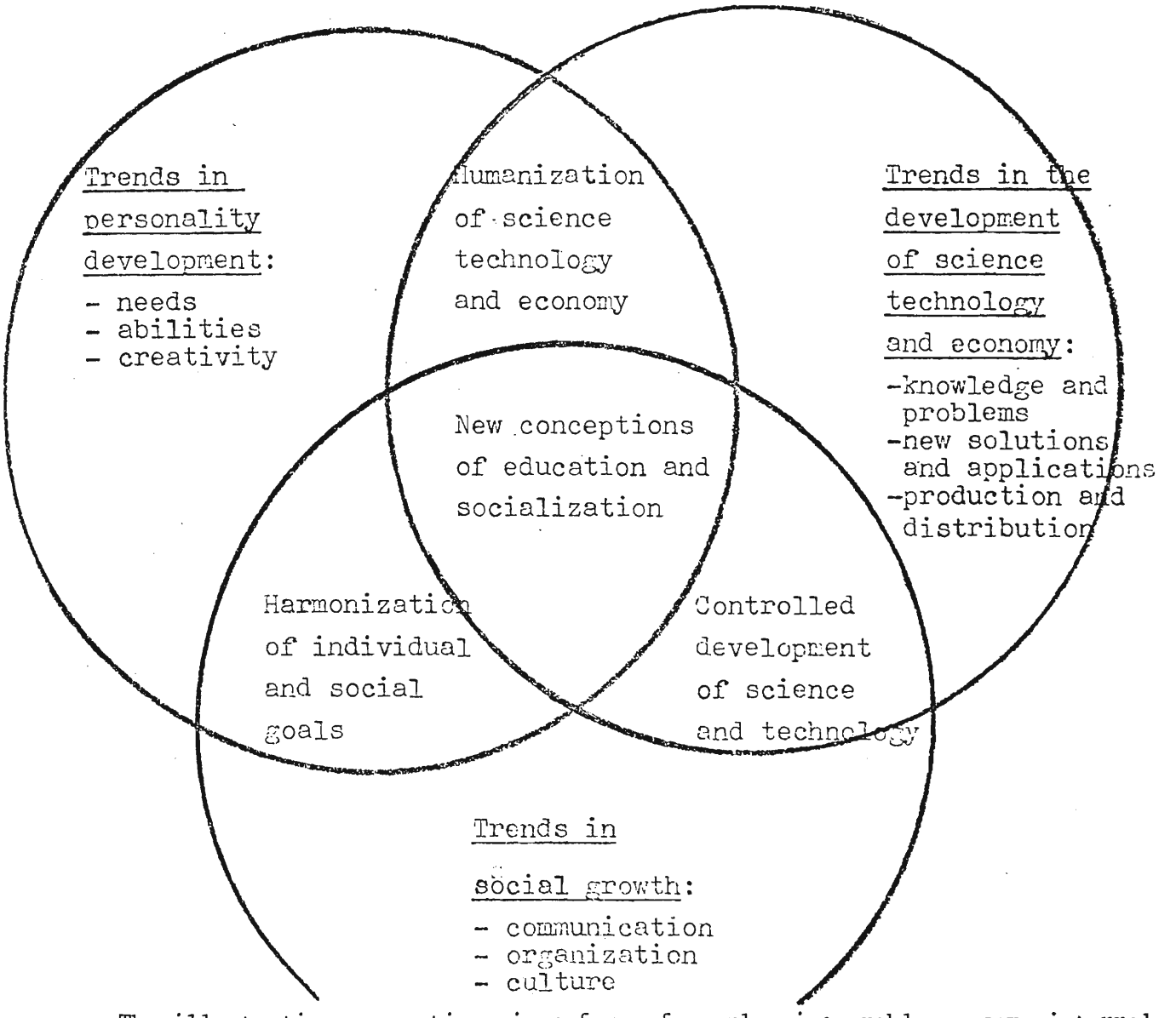
The maps of the territory are missing. A non-artistic version of one of them should look something like this:



OPEN EDUCATIONAL SYSTEMS AS THE PRINCIPAL CONDITION OF CREATIVE PERSONALITY DEVELOPMENT IN FUTURE

By Czeslaw S. Nosal
Forecasting Research Center
Technical University of Wroclaw
Poland

The discussions on the alternative conceptions of the personality development may commence with the analysis of interrelations of the contents of three basic conference problems: human needs, new societies, supportive technologies. The analysis results in a certain morphological structure, including a number of particular problems. One of possible variants of such a structure has been presented in the drawing.



The illustration presenting, in a form of overlapping problems, some interrelations of: 1- trends in personality development, 2- trends in the development of science, technology and economy, 3- trends in social growth.

From the illustration it follows that we consider to be the central problem is that of new conceptions of education and socializati Such new conceptions will have to integrate the programs of the development of the individual and society with those of the development of science, technology and economy. New models will have to allow to a higher degree for the extremely dynamic development of many domain of life.

Meanwhile, it is generally know that the existing systems of education and socialization do not satisfy present requirements[1]. Then to a still higher degree they do not comply with the requirements of the future. For that reason their organization and functioning are more and more often criticized. In part these critical voices can be formulated as the charge of disregarding the aspects of the future. At present the educational systems are in their major part determined by the experience of the past. Therefore they may ba called retrospective systems. To a low degree they make allowances for the states of probable future, they are not prospective systems.

In the present pronoucement we attempt a task of the analysis of fundamental attributes of the existing instructional systems from the point of view of possible future tendencies. In our analysis we shall concentrate only on three essential elements of the structure of instructional systems: strategy of instruction, program of instruction, methods of instruction. Those elements compose a simple hierarchic structure.

A. The strategy of instruction is understood as a certain direction of realization or a form of interpreting the general goals of edecation. Most of the goals of education have been formulated extemporaneously so far. It seems to be unquestionable that in the future it will be a continuous diagnosis of the current state and forecasting for different periods of time that will make the essential attribute of the strategy of instruction. Having that point of view in mind, we can distinguish two basic types of the strategy of instruction:

1. closed strategy by which we mean defining the goals of education on the basis of needs in a given period or programming those goals for a very narrow space of time,
2. open strategy which avails itself of a dynamic programming and of material in the shape of the forecasts about the development of instructure itself as well of those concerning the disciplines which are taught.

It is characteristic of the open strategy of instruction that the emphasis is laid on the structuring of knowledge and on the stimulation of creative thinking whereas the closed strategy prefers memorizing and reproducting possibly the abundance of information. The latter approach to the instruction is reinforced by media of mass communication. It is an overabundance, typical of our culture, of audiovisual pictures, connected with the impossibility of a specific, objective effect.

The future instruction must be based on the open strategy. The man will probably make important decisions for the direction of his learning as often as he now arrives at decisions cocerning his consumption needs connected with objects. That is one of the variants of the interpretations of the notion of permanent education.

B. The program of instruction may be generally defined as a certain index of problems and situations by mean of which we intend to realize various goals of education. The two basic types of the instruction program can be distinguished:

1. closed programs in a form of the complete list of problems and situations elaborately determined in respect of their contents, order and duration;
2. open programs existing in a form of the incomplete and roughly determined index of problem situations. Their minuteness of detail, order and duration will be defined at the stage of direct realization.

Open-type programs are directed towards solving real problems, whereas closed programs are most often limited to the realization o the history of solving certain problems.

The future of instruction lies mostly in creating and improving never and never versions of open-type programs. In particular, it wil concern academic teaching.

C. The methods of instruction. The problem of the methods of instructio can be examined from different points of view. Now we are interested in to a degree can a method of instruction increase the chances of i formation transforming during information obtainment, and to what a degree it facilitates transferring the rules of thinking and acting o new, unknow situations. From that point of view one can distinguish aiso two main classes of methods:

1. closed methods which we understand as the methods of instruction un- increasing the possibilities of information operation of rule trans- ferring. It is proper to notice that in all methods of this type it is the passive phase of information obtainment which is particularly set off;
2. open methods, by which we mean the methods of active instruction whic maximize the use of information and develop thinking. The best illu- stration of this type of method is a child's game in which the infor- mation obtainment and transformation are integrated with activity and creativity.

In the repertoire of open methods the most prominent ones are various rules of heuristic and intuitive type.[2] They constitute the strongest "weapon" of human mind, but which is mostly neglected in the instruction process today. In the future the importance of heuristic and intuitive methods will be increasing. Inevitableness of this process is due to the development and gradual diffusion of various technical media with computers at the head. They all are media which considerably facilitate searching, storage, copying, transmitting and partly transforming the information, but they do not

replace the intellectual functions, the most characteristic of our brain[3]. It can be seen particularly in the artistic, technical, and scientifical creativity of man. There are still many teachers nowadays who in their work seem to treat the human brain as a system more useful in coping the world than in its modelling in the multiplicity of forms as thinking,foreseeing,creativity. This stage of affaire results from the paradigms which are obligatory in the theory of instruction / in the terms of T.Kuhn's theory[4]/.

The psychological knowledge of the cognitive development of man / L.Vygotski, H.Wallon, J.Piaget, J.Bruner / is accepted with much difficulty by mass teaching practice. Little by little, however, zoomorphical /based on primary instincts /, and behavioristic-mechanistic conception of man / based on conditioning the systems of impulses and responses/ make concessions to the conceptions of the future man as to one being active, searching, foreseeing, and creative[5].

The individual development of man and the development of new societies are in their essential part determined by the conditions of his cognitive processes created within wide range systems of education and socialization. For that reason, speaking on new alternative conceptions of the personality development,one cannot do that quite apart from structured features of educational systems. Controlling the social development,and, first of all, controlling the development of science and technology will depend to a great extent on the state of education and the level of the consciousness of states and nations.

N o t e s

1. Learning to be. The world of education today and tomorrow, 1972, London; reported by UNESCO in the international commitete directed by E. Faure.

   In Poland a Commitete of Experts for Educational Matters had been constituted. At the beginning of 1973 they presented the results of their work and analyses; "The assumptions and propositions of the report on the state of education" /in Polish/, February 1973, Warszawa. There is a noticeable concurrence of propositions of the report of Polish experts working under the direction of Jan Szczepański with the results of UNESCO report.

2. Cf. consideration on heuristic and intuitive methods in: J.S.Bruner, The process of education, 1961, Cambridge, Harvard University Press; J.S.Bruner, The relevance of education, 1972, London, G.Allen/Unwin; G.Polya, Mathematical discovery: on understanding, learning and teaching problem solving, 1962 /v.1/, 1965/v.2/, New York, Wiley.

3. D.E.Wooldridge, The machinery of the brain, 1963, New York, McGraw-Hill; W.R.Reitman, Cognition and thught, 1965, New York, Wiley; O.K.Tikhomirov, 1969, The structure of human thinking activity, Moskow University Press / in Russian /;

4. T.Kuhn, The structure of scientific revolutions, 1962, Chicago Univ.Pr

5. L.von Bertalanffy, System, symbol and the image of man / man's immediate socioecological world /, in: I.Galdston /ed/, The interface between psychiatry and antrophology, 1971, New York, Brunner and Mazel .

CONTRADICTIONS IN EDUCATION IN TANZANIA

By Chudi C. Nwa-chil
Sociologist

1. Education and the Tanzania's economy:

The Tanzania's economy is still a subsistence one. Over 90% of its population depends on low-level agriculture for livelihood. Tanzania is a poor country, perhaps one of the poorest in the world - not in terms of its potential resources, for it has land, people and mineral resources, but only in respect of its present productivity and standard of living. In 1964, its income per capita was estimated at less than Shs 400/-. This year (1973) it is still below Shs 800/- (or U.S. $ 114) +.

This emphasis on Tanzania's economy is on Agriculture. According to the two Five-Year (Development) Plans (Tanganyika, 1964a, Tanganyika, 1969a), agriculture has been and will remain the largest productive area, and the one in which the majority of the people will continue to earn their living.

Tanzania's export economy depends largely on primary products like sisal, cotton, tobacco, and coffee, and to a lesser extent, cattle.

Agricultural development, and hence the development of a large part of the society, is to be effected largely through the creation of new Village Settlements Schemes (Ujiamaa Villages) in which Volunteers move into empty lands in large numbers and open up farming schemes with Government aid in the form of tractors, improved housing, rural water supplies, Agricultural extension workers, and Community Development Officers to give guidance to the Settlers. This hardly calls for highly educated manpower. As in the First Five-Year Plan (1964-1969), "fundamental social changes are not demanded from the farmers" to achieve this objective. But "planned Settlements do not only mean farms. It also means roads,commerce, and some local industries, as well as schools for the children, and health centres to help people enjoy the life they are creating" (Tanganyika, 1964a:x). These infra-structural

---

+ In addition, this is highly unevenly distributed.

activities certainly call for great know-hows, if not for professionalization. There must be teachers to man the schools; there must be experienced factory managers and skilled workers, engineers for the roads, doctors and health personnel for the hospitals and the health centres, and administrators to organize and execute policies, and so on.

When Tanganyika became independent in 1961, because the British was not particularly interested in the general education of the Africans, only a very few of her citizens had what one could call a modest education. For instance, in that year, only 598 Africans had any post-secondary education and only 370 Africans had a higher school certificate or its equivalent (see von Freyhold, 1972:7-8). In 1962, "over 86% of all jobs in Tanzania that required a university education were occupied by non-Africans. Specifically, there were in a population of over 10 million only 12 African civil engineers, 8 telecommunications engineers, 9 veterinarians, 5 chemists, and 1 forecaster. There were no geologists or mechanical or electrical engineer. Of the 600 graduate secondary school teachers, only 38 were Africans. (Okulo, 1972:76). In the same year, the annual output in secondary schools was still below 2,000; much less for the university - less than 200.

That is to say, for many years and for the whole period of colonial rule, the Tanzanian people had been educationally starved. Only a miniscule proportion of the total population received primary education, and an even smaller number received secondary and university education.

In the 1967 Census figures around 11,000 people were at that time employed as managers in the national economy (primarily in government and parastatal institutions. These represented only about 0.2% of the total economically active population. Around 86,000, or approximately 1.6% of the entire economically active population, were involved in the professional, managerial and administrative occupa-

tions. These individuals acquired their occupational positions through education. Another 36,000 (0.7%) were employed as clerks, secretaries, typists, etc., again through formal educational qualifications, but not as highly trained as those in the managerial and professional group. (Tanzania, 1971d:33).

It will not be an unfair estimate to say that today (1973) in Tanzania, probably not more than 200 to 300 of those 40 years or older have had university education or its equivalent, and probably too not more than 5,000 in the same age group have had full secondary education or its equivalent.+ In a population of 12 million (in 1967) these would mean only 0.002% and 0.042% respectively of the total population.

In other words, the Tanzanian society is still largely starved educationally. Except in a few scattered instances, the bulk of the high level manpower needed for development still comes from outside the country.

2. Socialism and Education in Tanzania:

The aim of Tanzania is to become a socialist state. And one concomitant of this is the belief that education is the birth-right of every child born into the society. And until recently (in June, 1973) when Primary education also became free in Public schools, only very small fees were charged at primary schools, and post-primary education has been free (since 1964) except in private institutions; the rationale being that while most parents can afford the small fees in the primary schools, with the high cost of secondary and post-secondary education, fees at the post-primary level would be difficult for them,

+These figures have been estimated from the Annual Reports of the Government's Department of Education from 1923. The method of calculation was to extract all those who had either completed full secondary education, usually four years after primary education, or were said to have entered Makerere or went abroad for further studies.
But according to the 1967 Census figures (Tanzania, 1971d), the figures for those 34 years or over in 1967 (which would be equivalent to our 40+ in 1973) who had university education or its equivalent were almost 1,000 and those with full secondary education over 17,500, which from all calculations other than this, is "fantastic".

and parents should therefore not be made to bear that burden.+ And even at the primary level, no child should be rusticated because of the inability of his parents to pay the fees. In both primary and secondary schools and in other forms of post-primary education, books and study materials are provided free of charge to the pupils. Most public secondary schools are boarding and students are given free meals and free transport to and from their schools. In the university, board, lodging and tuition are free and a modest amount for essential text-books is available to practically every Tanzanian student.

In turn, those who receive the privilege of being educated with the tax-payers' money are expected to repay the sacrifice (which others have made) one way or another. According to President Nyerere in his address to the Parliament while introducing the 1964-1969 Development Plan (Tanganyika, 1964a:xii) these are like the man who has been given all the food available in a starving village in order that he may have strength to bring supplies back from a distant place. If he takes this food and does not bring help to his brothers he is a traitor. Similarly, if any of the young men and women who are given education by the people of Tanganyika adopt attitudes of superiority, or fail to use their knowledge to help the development of the country or in a manner compatible with the country's socialist aspirations, then they are betraying the Republic.

That is to say, education must not be used for personal ends and monopoly of power.

+In Public Secondary Schools in 1970, the average cost per student was more than Shs 1,000/- for tuition only. In one Public Secondary school, the actual fees were Shs 1,400/- for tuition and Shs 480/- for boarding or altogether Shs 1,880/-. In Private Secondary schools in the same year, apart from the Seminaries, the fees charged per student ranged from Shs 900/- to Shs 1,900/- in Forms 1-4 and up to Shs 2,000/- in Forms 5 and 6. In the University, the tuition fee is Shs 6,000/- per student. (Information from the Ministry of National Education, Dar es Salaam).

3. The Contradictions in Educational Opportunity:

With these egalitarian doctrines of Tanzania's socialism, one would expect that the educational system would be equitable also in terms of its spread 'across' the "classes" and that there would be as much opportunities (if not in fact more because of their numerical superiority and greater financial handicapp) for those children of peasants, unskilled and illiterate parents in terms of access to (and perhaps also, achievement in) schools as there are for the members of the "elite". One would also expect "unselfishness" in the use of their education on the part of the educated Tanzanian.

But, in fact, the educational system in Tanzania "discriminates" between the rich and the poor, between the educated and the uneducated, and between the rural and the urban families.

Firstly, until June 1973, when education was made free in public primary schools, the fees in primary day schools were T.Shs 10/- in Standards 1-4, T.Shs 25/- in Standards 5 and 6, and T.Shs 40/- in Standard 7, per annum. In spite of these apprently low fees, many parents, and particularly the peasants and the unskilled workers, whose incomes were very low, still found it difficult to send their children to school. In a country where the per capita income is as low as below Shs 800/-, it was said that Shs 10/- alone school fees (for one child alone) represented a huge sum of money for a peasant or an unskilled worker and particularly one with many children. In a paper by Gottlieb (1972:33) based on Household Budget Survey of 1968, the author noted differential rates of expenditures on education for different income groups among some rural households: the lower income group spent only Shs 9/- annually on eudcation, which suggests that the low income groups are relatively handicapped in terms of educational opportunity. Mrs Grol-Overling (1969:112) also observed that in Mwanza, "School fees and the obligation to provide school-uniforms seemed heavy burdens for the parents" of her school sample. The majority of these parents lived in rural areas and were engaged in farming.

Ngila's (1971) article, like many newspaper articles, was non-empirical. But his charge was also that the schools of Tanzania discriminated against the poor peasants in favour of the economically well-to-do. Since Independence, he claimed, there has been a great 'thirst' for education by the masses. Yet, in primary schools, there have been thousands of vacancies: in 1968, 100,000; in 1969, 103,000; and in 1970, 108,000. This has been due partly to the inability of the poor peasants to pay the school fees.

Similar findings were also made by Mbilinyi (1973:25) when she observed that "fees remained an obstacle for some households in the enrolment of children in primary schools".

Further, in spite of the Government's directive that no child should be sent away from school on account of the inability of his parents to pay the school fees, it was found that children were actually sent away if they failed to do this. Thus Debbeldam (1969:92) found that "At reopening [of the school term] all pupils were requested to pay the school fees. In many schools pupils were sent home if they failed to bring the money and told not to come to school again without the money that parents were supposed to have received for sales of cotton by that time." Mrs Grol-Overling (1969:107), Ngila (1971) and Mbilinyi (1973) also made similar observations, Grol-Overling in Mwanza, and Mbilinyi and Ngila in various other parts of Tanzania. But in addition, Ngila found that even where a poor man's child in rare cases managed to secure remission of school fees, the pupil would have faced severe hardships - missing classes, etc,- which minimized the pupil's chances of going through his class Seven examinations. A study of 'who-is-who' entering Form One in most districts, he claimed, could well reveal the 'upper class' bias of entrants.

It was therefore the sons and daughters of the economically privileged people who were benefiting from the country's educational system, and enjoying the fruits of this independence, he concluded.

School fees have now been abolished also in public primary schools, and one would expect a higher participation rate and a more equitable representation of the various groups in the country. But this may not be so. Even when education is "free" as has been the case in most public secondary schools, the formal school fees are but only a part of the family expenditure on education; there is still the informal part. For example, the child is expected not to come to school in tattered clothing; and in most cases, he is compelled to come in "uniform". Mrs Grol-Overling (1969:107) even found that in Mwanza, "most schools required a clean uniform on Mondays and Thursdays ... which actually meant that each child had to have two uniforms" (our italics). In secondary education, though most public secondary schools are boarding and parents do not have to provide or pay for either food or study materials in them, parents still incur a lot of expenditure on their children's secondary education, sometimes as much as Shs 500/- on "a list of compulsory things a pupil has to take with him to school on the first day of arrival at the school". (see 'Daily News, 26 February, 1973). All these are but the "uncalculated" and informal educational expenditure which every family with a child in school makes. And most peasants cannot afford them.

Second, In Tanzania, there are presently not enough schools to go round even if all the parents could afford to pay the fees or make the informal expenditure.[+] Due to financial constraints, the present Government Policy is to hold primary education at a quantitative level of something like 50% of the age group (though, of course, with a higher participation rate over the years and an ultimate goal of universal primary education by 1989). At present, therefore, only about 50% of children of school age (seven-year-olds[§]) in the country can enter the country's primary school system annually. The remaining 50% would probably grow up illiterate, unless otherwise through adult education

[+]Note, there are vast areas in the country which are not served by schools but which cannot take advantage of the vacancies reported on pages 6 and 11 due to their geographical locations.

[§]This is of course in theory. In practice most children, particularly the rural ones enter school at a much later age (10-15). But it remains true however that only about 50% of any age group can get admission into the country's primary schools each year.

and literacy courses. And the majority of these are the sons and daughters of illiterate farmers and unskilled workers, who when the public schools fail them, are not able to compete effectively with the "elite" in private ones, which are even more costly.

For instance, in her study of 10 Primary schools in Mwanza Region, in 1966 and 1967, when the present full seven-year primary education for all who entered in Standard 1 had not yet become a fait accompli, Mrs Grol-Overling (1969:107-108) found that in rural areas many schools did not continue beyond Standard 4. Some 50% of the children of rural Lower Primary Schools were selected by means of examinations to continue at a neighbouring Standard 5. Consequently full Primary Schools (Standard 1 to 8) in the rural areas could also pass only 50% of their pupils. But the town schools were nearly all complete schools, so that all those who entered in Standard 1 had the opportunity to continue their education until they had completed Standard 8.

Further, at the end of Standard 8 pupils had to sit for the General Entrance Examination (G.E.E.), which was a nation-wide selection for entrance into secondary education. In her sample of two rural classes and two town schools the number of pupils who were successful in this examination was 9% and 10% for the rural schools and 15% and 18% for the town schools, which shows that in all cases, the urban child had higher probability of entering a secondary school through the G.E.E., he did not have to pay fees.

Morrison (1970:384) has also found that in 1966, a Standard 4 child in Dar es Salaam had a 97% chance of entering Standard 5 as compared to Kisarawe child whose chances were 63%. In Iringa, in the same year, the chances for an Iringa town child were 96% compared to 41% for an Iringa-Mufindi rural child.

Thirdly, the uneven distribution of schools in the country makes it also more difficult for the peasant and the low income worker to get a place in school than it is for an "elite. For one thing, in relation to total population and the (secondary) schools' intake capacities, more schools are located in the urban areas than in the rural ones, so that children with urban pattern of residence have greater chances of primary

and secondary education than children of "rural parents". For instance, of the 18 secondary schools in the Coast Region in 1972, 17 were located in Dar es Salaam which in the 1967 Census had a population of 273,000, and only 1 was located outside Dar es Salaam, with a population of almost 512,000 in 1967. Similarly, in Arusha Region, all but one of the five secondary schools there in 1972 were located in Arusha town. Comparable pattern of location is also noticeable in other regions.

Our argument here is that proximity and easy access to formal educational institutions have been known to facilitate school attendance. "The simple fact of living in a community with a large number of schools means that the parents, and later the youths themselves, become more aware of the possibilities and advantages of attending institutions of formal education." (Hurd & Johnson, 1967:67).[+] And as it were, most of the "elite" are also urban residents but the majority of the farmers (i.e. the non-capitalist farmers[§]) lives in the rural areas.

For another, due to the variational distribution of these educational institutions, most children of the rural peasants travel long distances (daily) to the school and on foot. In some areas this is as far as eight to ten miles. In Mwanza, Dubbeldam (1970:107) observed that rural children lived as far away as seven miles from school. Grol-Overling (1969:111) noted five miles, but added that in schools without a kitchen, 50% of the children did without lunch during the mid-day break.

On the other hand, for the sons of the "elite", location is not a problem not only because the schools are near but also because of the easier access to transportation facilities both private and public.

[+]This is implicit in the 'cry' by one writer in a 'Daily News' "People's Column" on 18 April, 1973, that his District is neglected in the allocation of schools, so that there is a proportionately low ratio of children in school attendance in that District.

[§]In his study of stratification in Iringa, Ahdu Awiti (1972:9) noted that "it is still the case that all the rich farmers in Ismani (Iringa District) without exception live in town [so that] they themselves could not know the real ... problems which the poorer peasants were experiencing."

Fourthly, it is said also that the nature of the parent's occupation acts as a "deterent" to the child's education. Under the still traditional (hoe-culture) agricultural economy operative in many villages, most farmer-parents see their children as more useful in the farm than in the school compound. In most rural families, almost as soon as the children can walk, they (the children) are engaged in a variety of economic and productive activities. In the seasons the boys accompany their parents to the farms. At home they help in the building operations or in getting food, usually grass from the bush, for the domestic animals, or simply watch over these animals as they feed in the bush. The girls take a share in the household duties. They carry water from the stream, collect firewood from the bush, rub floors, help in preparing the family meals, and take care of their younger brother or sister while their mothers are in the farm or market. As they grow older, they help their mothers in their core of trade and farmwork. Rural families are also in the habit of hiring out their small daughters sometimes as young as five or six years old, to other families and more so to the urban ones, as "ayah" (child-nurse) to the latter's children. Thus in a variety of ways, the rural child is an important "economic asset" to his parents, and this tends to "abstract" the child away from school.

For the "elite" and the urban dweller, the child is not a part of the "production force". The nature of the occupation of this "class" is such that the child cannot and does not help in production, except in a few scattered instances. In the rural areas most families are still a "subsistence unit" and production is carried out essentially within the family; in urban areas, except for some family businesses, production of most goods and services is carried out in factories or outside the household, and members of the family are employed not as one unit but as individuals. Work and home have become separated. And both by law and the character of these urban economic activities most children are excluded from production, so that they become entirely non-contributory to the family's economy. In short, the urban child is more likely than the rural one to go to school probably because he has less to do at home (see Dubbeldam, 1969:92, for similar conclusion about Mwanza).

In the 1971/1972 Annual Plan (Tanzania, 1971ap:50), it was noted that 13% of primary school places was left vacant in 1970/1971. Mbilinyi (1973:98) thinks that one possible reason for these vacancies was "that some parents perceive the costs of educating children to be greater than the probable rewards, especially given the low probability of either getting a secondary school place or getting a job after Standard VII". She argues (p.100) that since the chances of children entering secondary school was even slim now than before, but at the same time secondary education was even more necessary for getting a job, parents would conclude (p.102) that it was not worth it investing in their children's education "if (1) the child will not get into secondary education; (2) he will not get a job; (3) all he learns /in consequence of 'Education for Self-Reliance'/ is farming, which the /child's father/ can teach better anyway."

I prefer to suggest that it is probably more the occupational positions of parents than the future prospects in education which have tended to keep the child out of school. For instance, in the study in Mwanza, Dubbeldam (1969:92) found that "Parents' shortage of money /for providing school-uniforms and for minor contributions to the school/ and the parents' need for help (our italics) were the major reasons for /children's/ absenteeism" from school.

b. The 'Educated' vs the 'Un-Educated':

There is also abundant evidence to suggest that the educational system of Tanzania discriminates against the un-educated and in favour of the educated.

For example, in her study of "The Workers and the Nizers", Micheala von Freyhold (1972:34) found that "educated parents find it easier to get their children through the screening process", that is, through the educational system, and that "Whereas about three-quarters of those who had no formal education themselves had no child who had gone on to secondary school only one-third of those who had secondary school education themselves had not managed to get at least one of their

children who had left primary school into a secondary school." She also claimed "that more highly educated parents send all of their children to primary school and ... have also more chances of bringing more than one child into secondary school." (ibid). This was meant to imply that educational selectivity in Tanzania favours the educated "elite."

Earlier studeis by Verkevisser (1969) and Dubbeldam (1970) had also indicated similar findings.

Verkevisser's study was conducted in Mwanza between 1964 and 1967. Here she found that educational attainment and religion of the parents correlated highly with school attendance of children in the survey. All Christian parents of whom either or both went to school educated all their children, or at least 100% of their boys and 93% of their girls. Among Traditionalists, those with at least one educated parent educated 73% of their boys and 59% of their girls, and those with no education at all educated only 55% of their boys and only 7% of their girls. (Ibid, p.61).

In Dubbeldam's study, out of 377 Standard 1 children in the survey, 89 had fathers who had no school education, 246 had fathers who had 1-9 years of schooling and 20 had fathers with 10 or more years of formal education. In respect of occupation, 111 had fathers who were farmers or fishermen, and 237 had fathers who earned income off-the-farm. Of the latter, 124 were either craftsmen or skilled labourers (67), or unskilled labourers (58). Eight of the children (all in town) had fathers who were unemployed. In the two rural schools included in this sample, most of the children (89 of the 135 in all) had fathers who were farmers or fishermen.

Furthermore, of the fathers of 301 children for whom information on both education and occupation were available, 36 (or 39%) of the 92 farmers/fishermen had no education at all, and the rest had education ranging from only 1 to 9 years. Among those with off-the-farm income, including 7 who were jobless, 40 (19%) had no formal education, and 17 (8%) had 10 or more years of schooling. (Dubbeldam, ibid, pp.182-3).

Mbilinyi (1973:180) has interpreted Dubbeldam's data to mean that children of educated household heads and/or non-farm income are more likely to be enrolled in school.

4. The Contradictions in Manpower output and in the Economy:

That educational facilities in Tanzania is highly limited, and is provided only to a few is hardly surprising, given the dearth of the nation's actual financial resources. What is problematic is the fact that, as we shall see later, those on whom large amounts of the tax-payers' money were spent for their education are the main beneficiaries of the nation's wealth; these are the people who get a disproportionate share of the valued resources in the society.

First, there are many visible and disproportionate economic advantages connected with education, such as job opportunity, employment and income. But there are also other important social benefits of education, in the form, for example, of security in employment, avenue for power and prestige, and channel for positions of leadership in the society. These not only ~~had~~ have made education highly competitive, in a silent way, but also have tended to create and perpetuate inequality in the society.

a. Contradictions in Education and Job Opportunity:

Jobs for "the educated" have grown in number in recent years despite the limited supply of education. The majority of occupations today demands people with certain minimum educational attainment, whether or not this is connected with these jobs. At Independence, job opportunities rapidly increased at the high and middle levels of the occupational structure, primarily in the government bureaucracy. At the same time, emphasis was put on secondary and higher education to fill these positions; so that as job opportunities expanded, these were only for the 'educated'. Jobs for the 'un-educated' have dwindled. Even with an increasing number of primary school leavers, most jobs have become scarcer even for the secondary school graduates, so that the latter are now occupying positions previously held by the former.

This demand for education is of two kinds. First, there is the demand for those with specialized skills for work in the professions - the technicians, the doctors, the engineers, the lawyers, the teachers, etc. But this is understandable. These are but few of the really needed high-level manpower for development. And it is only through education that one can hope to get them.

But what is really surprising is that in spite of the shortage of educated manpower, more and more jobs demand people with high academic qualifications, sometimes unconnected with the jobs, or otherwise redundant. Thus, the post of a Senior Librarian demands not only that the applicant (or subsequent holder) should have "a full professional training in Librarianship plus administrative ability and experience as a Librarian" but also "a good academic degree" (see Sunday News, June 3, 1973). Similarly, a post for "Superintendent of Fire Services" (in the East African Airways) required that the applicant must not only be a "qualified Fire Officer with experience of not less than seven years in modern aviation fire fighting" (italics added), but must also have "sound educational background" (Daily News, March 23, 1973). And another for "Chief Budgets and Reports Accountant" required the candidate to have a University Degree with a major in accounting, in addition to being a Chartered Accountant, plus "at least five years' practical working experience in budgeting and cost proceedings in a major East African, European or U.S.A. Corporation" (Daily News, June 5, 1973).

b. Contradictions in Education and Un-employment:

What is further interesting is that while many posts in Government and parastatals cannot be filled by graduates (even by those with Liberal Arts degree) because of their shortage, many Form 4 (Secondary school) graduates, the majority of whom also were trained with public funds, go without jobs. In 1971, about 422 University graduates were required to fill immediate vacancies in the ministries and departments, but only 223 were immediately available for such posts. In the parastatals and quasi-government sectors, only 143 graduates were immediately available for the 548 vacancies requiring immediate occupation.

On the other hand, many Form 4 leavers go without employment. The Annual Manpower Report from the Ministry of Economic Affairs and Development Planning (Tanzania, 1971x:21) reported that in December, 1971 there were 2,478 Form 4 leavers who were referred to the Appointments Bureau to enter direct employment in government or other organisations. This was only 30.8% of the total Form 4 output that year. But by the

end of the year, only 54 places were secured and by end of June, 1972, only 318 pupils had been placed in different organizations.

There is contradiction here therefore between these apparently excess school products and the country's declared policy of providing education (including secondary education) only to the extent justified by the manpower requirements of the economy for development. (See Tanzania, 1969a).

But by no means, the Form 4 leaver is not entirely doomed. Rather his is an ironical situation in which the country's economy desperately needs (or is said to need) manpower at all levels, yet does not (or perhaps cannot) use them when these are available - a reflection perhaps of improper planning or improper co-ordination between education, manpower needs and the economy.

For, of course, in spite of what we have said, the Form 4 leaver is a lot better than his brother with less educational attainment. In 1969, for example, "out of 59,383 pupils who completed primary education, only 7,149 got places in secondary schools. 52,234 primary school leavers thus entered the labour market /in towns/ where only 16,215 wage jobs were generated during the year". (Tanzania, 1970f:84). That is to say, in Tanzania, unemployment trend is in iverse proportion with education: the un-educated are the highest 'un-employed', followed by a plethora of first school leavers, or those with only Primary school education who, after their primary education in the village feel they can no longer be contained in the rural areas and the 'subsistence old-fashioned' agriculture; and only lastly by decondary school graduates, who are now increasingly occupying positions previously held by the first school leavers, thereby depriving the latter of these jobs. But there is virtually no unemployment for the university graduate. On the contrary, the vacancy rate for the university graduate has increased in recent years due to new posts being created (see Tanzania, 1971x:78)+.

+Unemployment here must be understood in terms of the actual behaviour of the people, for it is strongly believed by the Government and the TANU Party that all the un-educated and all the primary school graduates have "ample opportunity ... to be profitably occupied on the land as self-employed farmers". (See Tanzania, 1970f:84).

c. Contradictions in Education and Income:

In addition to the growing demand for persons with skills and for educated people in general, it is also a truism that differential education attracts differential incomes, the more highly educated being generally paid more than those on the lower rungs of the educational ladder. In general, the B.A. or the B.Sc., gets more than the secondary school graduate, and so on, down the scale.

For example, in 1963, a Junior Executive Officer in the Administration, with Cambridge School Certificate got £633 as his starting salary. An Assistant Organization and Methods Officer with Higher School Certificate or Cambridge School Certificate with two credits, got £687. Whereas an Administrative Officer with a Degree (unspecified) got £798. (See Moore, 1963:30).

Today, this salary differential still persists inspite of the country's doctrines of social equality (see Tanzania, 1969a:1), or, more important, the fact that most of the secondary and post-secondary graduates studied with public funds. In the Establishment and Office Branches of the General Services Division of the Civil Service, a "Clerical Assistant" with Primary School Leaving Certificate (if indeed this cadre of workers does exist, for the only white-collar job a Primary School leaver could get today is Messenger post) gets Shs 2,016/- per annum; or if he completed Form 4 without obtaining the minimum awards required for direct entry to the Clerical Officer cadre, Shs 2,556/- per annum. A "Clerical Officer" with Cambridge School Certificate, East African Certificate of Education, or Form 4 Certificate, gets Shs 3,480/- per annum. Whereas an Administrative Officer (Assistant Secretary) with University Degree receives as his starting salary Shs 14,780/- per annum, or two incremental credits on this if he also holds a Diploma in Public Administration. (See Establishment Circular Letters Nos.5 of 1970 and 15 of 1968 from the Central Establishment Division of the President's Office, Dar es Salaam.)

Even more remarkable is the wider gap in the long-term income of people on different levels of education, as a result of promotions and salary increases which accrue to them through the years. In 1963, an Administrative Officer (Degree holder) appointed initially on a salary

of £798 per annum on Salary Scale A could progress by average annual increments of £50 to a salary of £1,791 per annum - that is, more than double his starting salary. But an Assistant Organization and Methods Officer (Higher School Certificate or equivalent) who started on a salary of £687 per annum got an average annual increment of only £30 and a maximum salary of £1,173, or less than double his initial salary, while a Junior Executive Officer (Cambridge School Certificate or equivalent) who started on £633 per annum and similar average annual increment of £30 could not go beyond £822 per annum (see Moore, ibid). In 1973, an Assistant Secretary (University graduate) could reach a maximum salary of Shs 18,540/- per annum from an initial salary of Shs 14,780/-, and by promotion, to over Shs 40,000/- as Principal Assistant Secretary Grade 1 or even as Principal Secretary of his Ministry or Department. If he were lucky, this would normally take him about ten years or even less since entering the Assistant Secretary post.

But a Clerical Officer (with School Certificate or equivalent) could only get a maximum salary of Shs 6,300/- per annum. By promotion, he could get to the post of Office Superintendent Grade 1 on a maximum salary of Shs 19,920/- per annum but only after about 12 years in service. Some however could reach an equivalent salary of over Shs 40,000/- per annum as Chief Establishment Officer, but this is more in theory than actual practice not only because it would require at least 20 years in service since entry into the Clerical Officer Grade, but by this time, this post would have been filled by University graduates.

d. Contradictions arising from the social benefits of education

Education in Tanzania also has other social advantages. It provides security in life, as well as avenue for social mobility, power and prestige. The educated have more stable, secure and permanent jobs, and are less likely than the un-educated to be dismissed in their jobs on a short notice.

In addition, education has become the chief mechanism for assigning the large majority of people into positions in society, the highly educated being assigned the most favoured and the most socially rewarded positions. As leaders and important functionaries, it is the

educated that also control the affairs of the state. And here it is to be recognized that 'leaders' do not necessarily mean only the members of the "Legislature", but include also the high grades of the Civil Service and of the private firms, the corporations and the parastatals, who constitute an important machinery of the state, and command enormous influence if not a power monopoly.

In the "Arusha Declaration" of 1967, a leader was defined as "Members of the TANU National Executive Committee; Ministers; Members of Parliament; Senior Officials of para-statal organizations; All those appointed or elected under any clause of the TANU Constitution; Councillors; and Civil Servants in the high and middle cadres." (Nyerere, 1968: 36). These are also the educated "elite" of Tanzania.

But more important, on the higher rungs of the Public Service of the country is the administrative machinery of government, where important decisions and government policies that affect the entire country and its relations with the outside world are made or at least executed. Practically all of the posts here are held by the more highly educated, i.e., the posts of Principal Secretaries, Assistant Secretaries, and Executive Officials of the Ministries and Departments. Even in the private sectors, education has become the dominant avenue to the majority of the decision-making positions. The "managerial" and "executive" class in priavte companies, parastatal organizations and quasi-government institutions are almost entirely products of higher educational instituitions.

These posts confer power and prestige, and enhanced as it were, by the fact that they also confer substantial incomes, their occupants have become very influential.

One effect of this is that education has come to be associated with greater opportunities: job, finance and status-wise. But more important, education has added to the people's future expectations and educational aspirations, so that they really compete for it. The result is that people now pursue education almost entirely for selfish ends, the socialist doctrines of Tanzania notwithstanding.

Summary:

Let us now summarize what we have been saying so far. In Tanzania, there is an economic and political conflict in education. First, education is believed to be a major instrument for the achievement of the social, political and economic aspirations of Tanzania. Second, education is conceived of as an inherent or inalienable right of every citizen, and ideally every Tanzanian child should have equal access to it.

But Tanzania is poor, and does not have the necessary manpower. Most of the manpower for development still come from the outside. Yet, in Tanzania, education is scarce and is provided only in limited quantity.

Again, in various ways, Tanzania's educational system discriminates between the rich and the poor, the peasant and the white collar worker, the urban and the rural dweller, and the educated and the uneducated, with respect to access to it. This means that every individual has not in fact equal opportunity to it, not even to primary education.

In Tanzania, there are contradictions also between

a. education and job opportunity; the educated are scarce, yet numerous occupations demand very high and sometimes redundant formal educational qualifications,

b. education and un-employment; many posts remain vacant, yet many secondary school leavers go without jobs,

c. education and income; the educated are dispropoftionately rewarded both in the short and in the long run, and this notwithstanding (i) the egalitarian doctrines of the country and/or (ii) the fact that majority of the school graduates have studied with public funds,

d. education and its social rewards; the educated have both the power and the prestige. This has made them very influential in the society But it has also made education highly competitive (though in a silent way) and people now pursue it almost entirely for selfish ends, and without regard to the 'Mwongozo', the 'Arusha Declaration' or the socialist doctrines of the country.

References:

AWITI, Adhu (1972) "Economic Differentiation in Ismani, Iringa Region: A critical assessment of peasants response to the Ujamma Vijiji Programme" (DarEsSalaam, Economic Research Bureau) Mimeographed.

DEBBELDAM, L.F.B. (1969) "Schools, Teachers and Parents" in CESO: Primary Education in Sukumaland (Tanzania) (Wolters-Noordhoff Publishing

DUBBELDAM, L.F.B. (1970) "The Primary School and the Community in Mwanza District, Tanzania" (Groningen, The Netherlands: Wolters-Noordhoff Publishing)

GOTTLIEB, Manuel (1972) "The Process of Differentiation in Tanzanian Agriculture and Rural Society" (Dar es Salaam, ERB) mimeographed

GROL-OVERLING, A.C. (1969) "The School" in CESO: Primary Education in Sukumaland (Tanzania) (Wolters-Noordhoff Publishing)

HURD, G.E. & T.J. JOHNSON (1967) "Education and Social Mobility in Ghana" (Sociology of Education, Winter 1967, Vol.40, No.1) pp.55-79

MBILINYI, Majorie (1973) "The Decision to Educate in Rural Tanzania" (Dar es Salaam University, Ph.D Dissertation, Unpublished)

MORRISON, David R. (1970) "Education and Political Development: The Tanzanian Case" (Sussex University, Ph.D. Dissertation, Unpublished)

NGILA, N.L. (1971) "Contradictions in Economic Policy" (Dar es Salaam: The Standard, November 16)

NYERERE: J.K. (1968) "Ujamaa: Essays on Socialism" (Dar es Salaam: Oxford University Press)

OKULO, Henry A. (1972) "Manpower Development in Tanzania" in 'International Inst. for Labour Studies Bulletin,'No.9 pp.75-90

TANGANYIKA, The Republic of (1964a) "Five-Year Plan" for Economic and Social Development, 1 July 1964 - 30 June 1969, Vol 1: General Analysis (Dar es Salaam, The Government Printer)

TANZANIA, The Rep. of (1969a) "The Second Five-Year Plan" for Economic and Social Development, 1 July 1969 - 30 June 1974, Vol.1: General Analysis (Dar es Salaam: The Government Printer)

TANZANIA, The Rep.of (1970f) "The Economic Survey and the ANNUAL PLAN" 1970-1971 (Dar es Salaam: The Government Printer)

TANZANIA, The Rep.of (1971x) "Annual Manpower Report to the President, 1971" (Dar es Salaam, Min. of Economic Affairs & Development Planning)

TANZANIA, The Rep.of (1971ap)"The Annual Plan for 1971/1972" (Dar es Salaam: The Government Printer)

TANZANIA, The Rep.of (1971d) "1967 Population Census" Vol.4 Economic Statistics (Dar es Salaam, Min. of Economic Affairs and Devpt Planning)

VERKEVISSER, Corlien M. (1969) "Growing Up in Sukumaland" in CESO: Primary Education in Sukumaland (Tanzania) (Wolters-Noordhoof Publishing)

von FREYHOLD, Micheala (1972) "The Workers and the Nizers" (Dar es Salaam University, Dar es Salaam) Mimeographed.

CONFERENCE PROCEDURE

GROUP 3

Meta-scenario of alternative quality-of-life models, new societies based not only on the feasible but also on the desirable.

QUALITY OF LIFE AND FREEDOM AS ITS BASIC CONSTITUENT

By Pavel Apostol
Professor of Philosophy and Sociology

It seems to me that we shall not be able to follow Denis Gabor's recommendation for presenting concrete scenarii or meta-scenarii. Neither because we don't want it, nor we can't it. But before we proceed to develop a scenario concerning quality of life (QOL), it is unavoidable to define what we have to deal with.

A normative approach supposes an explicit and clear definition of goals, objectives and of a referential value-system. Or, the concept of life's quality is now to be an unequivocally determined one, which might permit to proceed without any previous preparation to build up an operational strategy or scenario aiming at its achievement.

This state of facts inspired me to raise the problem formulated in the title of my paper. Even it does not appear to be a concrete approach, in my opinion, to clear up the operational meaning of QOL constitutes a necessary if, of course, not sufficient condition for a concrete scenario or strategy in this matter. Moreover, a certain search for "concrete" reminds me of one of Hegel's remarks. For a saleswoman in a market people are divided into those who buy and those who don't buy. At the first look, one might deem this view as an extremely concrete one,because it refers to sale and purchase. In fact, says Hegel, this is a most abstract approach because all the other qualities or determinations of man are omitted and reduced to the single capacity to be a buyer or not. We shall not adopt the market saleswoman's perspective. Subsequently we can't operate either with a vague concept as to QOL, nor can we reduce the respective content to one of its components.

Therefore, let me begin with a short discussion on one of the most spread definitions. In a commentary to a significant text of Bertrand de Jouvenel (1), Kurt Baier gives the following definition: QOL means "the natural and cultural amenities, the variety and quality of the goods and services made available to the members of a given society" (2). Generally, this definition as well as other, similar ones, are very often utilized. Both a politologist, as K.W. Deutsch (3) and an economist, as P.A. Samuelson (4), understand by QOL something that refers to the macro-level and to the value tied with performances of social systems or economic ones, as far as that affects the living conditions of everybody.

Here we are confronted, in my opinion, at least with two questions.

First, how may be measured the QOL or, more exactly, its dimensions?

Secondly, what does the individual believe or appreciate to represent the just quality of his life?

This second point presents today a greater interest, exceeding the weight of the first question, which, generally, focuses the main attention.

The definition quoted above has a feature, which, usually, is not stressed. Namely it shows of what a certain society gives, offers, to the individual; it is not taken into account what the individual needs, desires or wants, but only what the society actually is willing to offer him.

Of course, this attitude doesn't signify a contraint behalf of the society, but, certainly, it is a manner of manipulation of conscience and instrumentalization of the individuals through their needs. Evidently, this definition excludes the free choice and option by the individual.

Bertrand de Jouvenel (5) has felt the imperfection of such an interpretation, and has introduced a radical corrective telling

that QOL means the possibility the individual has to fit up himself (aménager) his living conditions. By this precizing, freedom is involved in the definition, but not explicitely stated.

We feel the necessity to introduce explicitly freedom, as a basic constituent, into the concept of QOL. It is true that some research-workers are speaking of freedom as of an element of QOL. But in the most of those cases (6), freedom is considered in the negative (7). What we need is a positive definition of freedom.

Some years ago, we have elaborated such a positive definition of freedom as a concrete possibility and potentiality to produce, to reproduce and/or to produce anew, on an enlarged basis, selectively and optimizingly the conditions of its own achievements and surpassings considered as an aim by itself (8). I put at your disposal the respective German version of my reflections in this line. This definition seems to me adequate to light up several social processes and institutions and,, at the same time, to analyse them concretely if they fulfil the criteria of a continuous growth concerning the conditions of freedom.

Now, in the event we want to introduce freedom into the meaning of QOL, we have to complete the quoted definition by the supplementary finding: "as well as the attitude of the members of the considered social system to the amenities actually accessible and reflected in the value assigned to them".

In other words, the complete definition of quality of life has to be the following: the totality of the natural and cultural amenities, the variety and quality of the goods and services made available to the members of a given society, as well as the attitude of the members of the considered social system in respect to the amenities actually accessible for each and for all and reflected in the value assigned to them.

Further, the problem comes out what we have to understand by available to the members of a given society". Examining this

aspect, we are aware why the first definition is not sufficiently comprehensive. In this definition it is supposed that all individuals dispose of sufficient resources and opportunities to enjoy the amenities, goods and services we spoke of. As a matter of fact, one knows that the average per capita of the available amenities (goods, services) is not homogeneously assigned to each member of the society. Some benefit of privileged situations reaching even the character of a monopoly to acquire amenities etc. much more than the statistical average, while others by the pressure in which they live, have not the possibility to approach that average. The esteem of QOL by both categories will differ each other proportionally to the effectively accessible lots and qualities of amenities (etc.) they are able to provide by themselves. QOL is specific to each social group within the framework of the respective social systems.

But, the problem becomes more complicated also from another point of view.

Namely, they are sensible differences among countries concerning QOL, respectively GNP, standards of life etc. The gap is an enormous one. More than the half of the present world population, exactly 1900 milion have yearly incomes of less than 150 $ per capita, 770 milion had a yearly income between 150-1000 $, and only 583 milion had an income which exceeds 2000 $, reaching 5000 $ and more in the United States (9). This represents real, incisive and charging restriction of freedom for those belonging to the first two categories. Mankind reaches an unhuman state. I consider to be entitled expressing my conviction that we have not to appreciate at all the discourse on futures which limits itself to take into account lines of development exclusively possible for a population representing, at that moment, only a coefficient of about 15% of the world population, or more exactly a fraction of the whole population leaving in privileged countries. We have used the word "fraction", because the data given by Fr. Perroux show that even in this minority of highly developed

(rich) countries, poverty is not a simple phrase (10).

Discussing QOL, I can't oversee this state of affairs. Let me approach the point. There is a rethorics, largely diffused, which sustains that problems of our time and all the more those of future have to be considered in a world-wide-perspective. In this respect I do agree fully with John McHale (11). But as I had stressed two years ago, in a letter to him, it is the question of world-extent presenting several heterogenities. The idea of a heterogenistic world is developed fervently and convincingly preconized by Magoroh Maruyama (12). However, this heterogenity, applied to the problem we are discussing can not only be interpreted as a diversity in tastes and mentalities, in patterns or styles of living. It is, in fact and in the first line, a heterogenity related to the conditions of existence and of freedom in given and future social systems and affecting further individuals within the framework of them.

The heterogenity of our world includes, therefore, inequalities in economic and, generally, in social resources, chances, opportunities, which impose limits to freedom and to the accessible QOL.

For me, it seems to be indispensable to raise some questions, in connection with the existing heterogenity in QOL.

There are serious reasons to assume that the high QOL in some countries is based upon the past colonial or deguised colonial exploitation of ones by others. The effect was and is the following: a lot of states were put into a situation of helplesness which gave the others the possibility to accumulate riches. The gap between human and under-human QOL, far from having vanished, is, on the contrary, deepening, as a long run consequence of cummulated investments. For that, we are on a fundamentaly false way believing that the outstanding disparity in the QOL which is visible between rich and poor nations is exclusively due to a certain tradition, chrystalized in the course of history, and to differences in mentality or style of living.

living.

If we agree that problems must be considered in a world-wide prospect, then we have to deal with QOL in a world-wide prospect. That means, taking into account the above mentioned heterogenity and a strategy to face and to solve the problems deriving from this situation. What can practically be done for creating equal changes for each nation? Tackling the problem in this light, we shall be immediately aware that it is overhelmingly more difficult, then it is generally appreciated.

The real solution, ensuring equal human rights and dignity involves to cancel the consequences of centuries with a view to a just and balanced redistribution of the cumulated investments among nations. You will admit, the chance to reach such a reconversion is transcending routine-strategies. If social imagination is needed, as says Robert Jungk, then it is here the place to apply it, and not to waste our straints and minds for solving certain sophisticated problems - which without any doubt are existing - concerning, however, only a very small part of the mankind, living in abondance.

In this connection, I want, further, to stress that accepting the idea of heterogenity, we can't admit, in it's name, that the lack of certain negative aspects of modern civilization justifies the maintenance of primitive conditions of living in the underdeveloped countries, not by their own will, but compulsory.

In these cases, we are not entitled to speak of QOL because of the absence of freedom.

We have submitted to you some considerations concerning the conceptual framework within one might conceive scenarii and strategies to innovate and to improve QOL.

Now, we may return to the first question mentioned at the beginning of may paper: the measurability of the dimensions characterizing QOL.

By the proposed definition it is shown that we must consider QOL determined by a set of indicators, the so-called social indicators.

This set can be divided, as we have seen, into two subjects: one referring to accessible amenities, and the second comprizing evaluations.

By a further analysis, we can put in evidence also the weight of each social indicator in a certain set defining a certain QOL All the literature dealing with the possibility to formulate exactly, quantitatively the problem seems to be on a complete wrong way.

In principle, it is possible to measure facts and processes which are necessary for the establishment of a social indicator. Practically, however this is often impossible to realize. This impossibility is of pure pragmatic nature, and can be overpassed by a corresponding financement of social researches. When we shall have investments in social sciences comparable to those in technology on space research, the respective results will be not less outstanding.

Let me end, with the following remarks:

1°. The debate on QOL supposes a right definition of its contents.

2°) QOL is function to social systems and their sub-systems or partial-systems, in which the individuals are living.

3°) QOL includes accessibility to amenities as well as attitudes compared to those expressed in value assignments.

4°) To forecast the evolution of QOL means to explore the range of possible, desirable and feasible developments.

5°) On world-level, we have to take into account to ensure a free heterogenity of qualities of lives, i.e. realizable choices, without contraints, determined by the lack of accessibility to the minimal conditions to cover basic needs and wants.

(1) Bertrand de Jouvenel, "A better Life in An Affluent Society", Diogenes, X (1961), reproduced in Arcadie, ou l'art du mieux-être, IInd ed., SEDEIS, Futuribles, Paris 1971.

(2) K. Baier, "What is Value"? An Analysis of the Concept", in K. Baier and N. Rescher (eds), Values and the Future (1969), Paperback Edition, the Free Press, New York 1971, pp. 45-46.

(3) K. W. Deutsch, Politics and Government, Houghton Mifflin, Boston 1970, pp. 204-223.

(4) P. A. Samuelson, Economics, 8th ed., Mc Graw-Hill, New York 1970, pp. 776-777.

(5) Bertrand de Jouvenel, ibidem, pp. 60, sq.

(6) See, for instance, N.C. Dalkey, R. Lewis, D. Snyder, Measurement and Analysis of the Quality of Life: with Exploratory Illustrations of Applications to Carreer and Transportation Choices, RM 6228 DOT, Rand, Santa Monica, August 1970.

(7) D. Gabor, Der vernünftige Mensch, Scherz, Bern, München, Wien, 1972, p. 196 (German translation of the Authors: The Mature Society, 1972).

(8) Pavel Apostol, "96 Sätze über Tod und Freiheit in Hegel's Philosophie und in unserer Zeit", Praxis, VIII (1971), nr. 1-2, pp. 191-202.

(9) Analysen und Prognose, V (1973), 26, p. 9

(10) Fr. Perroux, Masses et classes, Paris 1972.

(11) John McHale, The Future of the Future, Braziller, New York, 1969.

(12) Magoroh Maruyama, "Toward a Cultural Futurology", in: 1970 American Anthropological Association. Cultural Futurology Symposium: Pre-Conference Volume (mimeo.) I-1-30.

(13) Denis Gabor, "Une planification ouverte", in E. Jantsch, Prospective et Politique , OCDE, Paris 1969, pp. 313-331.

TOWARDS A METHOD AND AN EPISTEMOLOGY OF SOCIAL FORECASTING

By Yves Barel
CNRS
IPEPS Université de Science Sociales
Grenoble, France

What we can call the "faculty of anticipation" has deep biological roots which the human species shares with other living systems, but which acquires a specifically human aspect deriving from Man's power of symbolisation. Anticipation - or forecasting - is therefore almost as old as Man himself. What makes for its apparent (and perhaps real) novelty, is its recent claim to a scientific content, although, in my opinion, its present meaning is still essentially of an ideological order.

THE EPISTEMOLOGICAL STATUTE OF FORECASTING

One must temporarily dissociate the basic concept of forecasting from that of temporal forecasting, with which it is often confused. Generally speaking, it only complicated matters if, right from the initial stages of an analysis, one takes as an acquired fact something which should in effect be the result of this analysis, that is to say, the distinction between past, present and future.

At a certain point, every science and every research comes up with a type of forecasting, in the methodological and epistemological sense of the term, a sense which does not necessarily imply a temporal dimension. Forecasting can, in certain cases, acquire a temporal content, but it is logically distinct from it. More generally, scientific procedure disjoins itself, in a certain way and to a certain extent, from a temporal dimension: scientific law is, within certain limits, a-temporal.

Forecasting indicates a particular category of inference which the specialists call extrapolation (evidently distinct from extrapolation in the sense in which the term is used when extrapolating a tendency of the past towards the future). Inference is a deduction or an induction which comes into play outside experimentation, It consists in speculating by analogy - on the basis of data acquired - on the persistence of an observed order (1).

---

(1) - Naturally, including an order in change.

A first variety of inference is therefore interpolation: it is an inference (the passing of one truth to another truth) within a possible area of experimentation. Extrapolation consists in inferring beyond possible experience or the period known. Forecasting or extrapolation consists in filling up certain blanks in knowledge without any immediate possibility of verification or experimentation. In this sense, forecasting is an intellectual operation which certainly applies for the future, but equally for the past and the present. It is not tied to a temporal placement. This made it possible to "forsee" the existence of planets and chemical elements in a situation where these planets or elements were obviously already in existence. From what has been said one can see that inference-forecasting is nothing other than the totality of processes for that up-dating of knowledge which is one of the final aims of scientific research, since this process does not rest exclusively on direct observation. It is the exploration of the unknown beginning from what is known. This exploration simultaneously makes use of three fundamental intellectual operations:

1° - The search for "legitimacy"

I define legitimacy as the intellectual organization of material social, psychological etc. reality by means of laws. Scientific laws are defined as regularities of verifiable relations between two or more phenomena. They take the general form of the type: if A exists, then B also exists, or follows it. One law simply ascertains the existence of a regularity and does not in any way claim to explain it. It follows that to start with legitimacy rests fundamentally on observation. Something is affirmed, simply because its existence is empirically ascertainable. It is easy to understand that legitimacy is thus at the basis of what is still (unfortunately) the fundamental process involved in any forecast claiming to be fairly precise, that is to say, extrapolation in the current sense of the term.

2° - The search for causality

Reduced to its simplest expression, causal research consists in basing the authority of a scientific law no longer on the simple ascertainment of the empirical existence of this law, but on the demonstration of its character as a logical necessity.

One can therefore, in an artificial manner, uphold the idea that there are two essential types of forecasting: explanatory forecast or predictive explanation, and "legitimate" anticipation. In principle, the first is superior to the second, in that its legitimacy is founded on a logical necessity and not on simple empirical observation (always or nearly always conditional and such as to be questionable) of the existence of a certain order of things. However, paradoxically, it is possible that in pure sciences, where causality "disappears", as in certain parts of physics, "legitimate" forecasting becomes the ultimate objective of research.

3° - Scientific symbolisation

Certain schools of thought restrict science to the search for legitimacy and causality. This appears to be an epistemologically untenable position. Our science would not be what it is if it did not constantly appeal to a symbolical structuring of the observed reality which is analysed, ultimately, as a hypothetical representation of this reality. A theory is only made up of empirical correlations and causal processes. It implies symbols which are no more than the applications in the scientific field, of that power of symbolisation which, as we saw before, is at the root of Man's faculty of forecasting, in all the aspects of the practical or mental activity of the human species.

To the extent that it is a symbolisation (1); any theory is an

---

(1) - and is distinct from scientific law. On these points see the admirable works by N.R. CAMPBELL and G. CANGUILHEM quoted by BOURDIEU, CHAMBOREDON and PASSERON ("Le métier de sociologue"), Mouton/Bordas, 1968, p. 292 ff., and 311 ff.

anticipation or a forecast which precedes or surpasses knowledge which is simply the fruit of "legitimacy" or causal mechanisms. All sciences offer examples of anticipations of this type: one could find some striking cases in mathematics, physics and biology. DIRAC's electron is no other than the system of equations proposed by DIRAC to explain the hydrogen spectrum. The neutrino was a product of reason before becoming an object of experience. The same applies for the gene in biology: the "arrow of time" is also a symbolisation of this type, etc.... In passing, one can observe the striking similarity between the process of theorization as we have defined it and the utopical process. Theorization is also an exploration of possible collaterals. To restrict science to what is observable or logically demonstratable is the best way to make it fruitless.

An interesting consequence follows from these observations for social forecasting. As BLALOCK has rightly observed, the ideal model of forecasting is a completely deductive closed system.

A system is completely deductive when each proposition follows from a preceding one and justifies the following one, in a linear chain. However, the majority of social theories (in fact, it is safe to say all of them) are not of this type: the plausibility of each proposition in a function of the plausibility of all the others, in such a way that the whole is tautological. It follows that there can be <u>other</u> equally plausible and tautological wholes, without there being a way to decide which is the good one, or which expresses "the truth". As a consequence, the <u>same forecasting</u> can be based on <u>various</u> theories. There is no longer a univocal link between forecasting on the one hand and theory on the other, in that measure or the theory does not only include empirical regularities or causal mechanisms, but also a symbolical conjecture or conjectural symbolics.

In applied research and forecasting, the three fundamental intellectual operations are closely entwined, One can verify this even using the most rudimentary example, SOCRATES' syllogism. This syllogism brings into play legitimacy by the statement that all men are mortal, causality

and deduction by the statement that, since Socrates is a man, he is mortal; symbolics by his very concept of Man. The prediction Socrates' death rests on a "theory" of death. One could envisage an infinite number of other theories producing the same forecast: for example, one could build the syllogism on the mortality of animals; or on the mortality of the Greeks, etc. What changes, in these different theories, is the symbolical element.

Studies in applied forecasting show a predominance both of extrapolation and of non-scientifically controlled symbolical imagination, as well as of a strange mixture of the two methods of approach to the future. This sorry state of the "art" of forecasting shows that the epistemological and methodological problems of social forecast are not particular to it, but human or general. The present trend towards a growing sofistication of prospective methods is, in my opinion, a methodological impasse. These methods move "in neutral" in that they themselves do not enable any progress to be made on the points which are an obstacle to reflection on the future: causal research and symbolisation.

THE OBJECTS OF FORECASTING

At the conclusion of this rather simplistic examination of the problems posed, it is fairly startling to have to conclude that the exercise of historical analysis and the exercise of forecasting do not present any considerable difference, since they consist in the examination of the same phenomena (of the past and of the present) with the aid of the same methods (legitimacy, causality and symbolism). The only difference is that, in the first case, the phenomena can be examined both as causes and as effects, whereas in the second they can only be examined as causes (1).

---

(1) - and, due to this very fact, can only represent a part of the causality of their future effects.

The difference lies in an effected causality versus an effecting causality. It follows that the object of forecasting is the same as the object of history and of the other social sciences; it is present social reality whence one goes back to the past by recursion, and looks onto the future by anticipation. To say that one can act on the future but that one cannot know it is therefore a doubly false formulation; one knows the future to the extent that one knows the present: and one does not act on the future but, obviously, on the present. Social reality, the object of forecasting, has a temporal breadth. It is not the present, a category which disappears as it comes into being since it is permanently that which is no longer and that which is about to be. Social reality is a temporal continuum of effects and causes in action. It is a fact that social forecasting is, in an overall sense, the less scientific part of human and social sciences. However, it would be wrong to believe, as is often the case, that this inferiority derives exclusively from the specific difficulties involved in forecasting the future. This is the case when forecasting bears on specific and dated events, because then the fact of not knowing the "missing causality" and of over-determination plays a major role. On the other hand, in the weaknesses of forecasting bearing on large quantities of events it is the deficiencies in the observation, explanation and symbolisation of present and past reality which play the essential role. Progress in forecasting seems to depend above all on the overall advancement of social and human sciences, rather than on an effort restricted to prospective methods as such.

AN EXERCISE IN SOCIAL FORECASTING BASED ON THE IDEA OF REPRODUCTION

A - THE THEORETICAL SCHEMA

Our attempt has consisted in trying to describe certain social wholes as a particular category of living systems, the structuring and functioning of which he dominated by the aim of reproduction. Social systems, in that they are systems, are therefore defined as reproducible

social structures.

Among the social systems of which it might be interesting to study the reproduction, there are those which we call, as Marx did, social formations. In the first place, one can imagine a social formation as a combination, a structure of various modes of production.

We have thus been led to distinguish, in every social formation, two types of elements and of relations between elements: specific elements and relations on the one hand, associated elements and relations on the other. The two are necessary for the analysis and the complete definition of a social formation. However, the two have a very different position where the reproduction of the social formation is concerned. The disappearance of the former interrupts a cycle of social reproduction and introduces a new one: in other words, it marks the substitution of one social formation with another. On the other hand, the presence of the latter, even when it is necessary for the reproduction of the social formation, does not define in what this formation differs from the other formation.

B - APPLICATION OF THE SCHEMA TO CONTEMPORARY SOCIETIES

I wish to begin from the idea of the capitalist social formation. What makes this formation specific is the dominance of the capitalistic mode of production over other modes of production, and over the systems of sub-systems which make up the formation.

The capitalist formation includes numerous associated systems. A first important aspect of research would consist in building up a list, as precise as possible, of these systems. It would include, for example, the State, economic planning, perhaps a part of the urban system, the educational system, the system of scientific and technical research, etc.....

A second aspect of the research would consist in studying the network of relations existing between associated systems, and between these systems and the capitalist mode of production. This study, simultaneously synchronic and diachronic, would at the same time enable us to understand in what way the capitalist mode of production ensures its

dominance over the formation as a whole, and to identify the principale forms of de-connection and re-connection observable in the history of capitalism from its origin. It would constitute the basic material for a genuine forecasting operation.

This operation would begin by the problem of knowing if one can ascertain the emergence, within the capitalist social formation, of new modes of production.

There are at least two possible candidates to the qualification of new modes of production: cooperatives on the one hand, State-run production on the other. Let us choose to concentrate our attention on State-run production for the simple reason that it represents, in the long term, a quantitatively more significant phenomenon than cooperatives. This choice is a temporary one, a working hypothesis which it might be necessary to question during the course of the research.

Starting from this point,the forecasting operation consists in examining the reasons for or against the conclusion that the State-run branch of production indicates the emergence of a new mode of production: the maintenance of the wage-system, differences in the way of accumulating capital, the emergence of new qualifications, other than private property, to justify the possession of the means of production, the emergence or not of the logic of human needs alongside the logic of profit and of market, the taking into consideration of factors which enable this new mode of production to become dominant, etc.

One thus formulates on a whole range of conditions judged to be sufficient for the emergence of a new way of production. Let us say that the minimal condition is a State-run system of production aimed principally towards the satisfaction of human needs.

The maximum condition would therefore be a public system of production within which the monopoly of an élite over the instruments of production would have disappeared and where the satisfaction of needs would escape the constraints engendered by the massive accumulation of capital.

The choice between the minimum and the maximum formula is difficult, in fact impossible. In order for it to be carried out on a valid basis, we should know precisely what we are trying to find out, that is to say, the contents of the mode of production which is to succeed to capitalism. However, the difficulty or the impossibility of the choice, although it does contaminate the analysis with an unavoidable fragility, does not however put a stop to research. A new way of production does not necessarily emerge ready-made and in its definitive form from the existing social formation. On the contrary, the most plausible hypothesis is that it only progressively actualises its potential characteristics, If we go back just a little, to the time of the transition from feudalism, we realise, for example, that there have been numerous forms of production representing a sort of incomplete capitalism; serfs were still used in certain Scottish industries in the XVIIIth century, the Russian capitalist system in its early stages contained many survivals from serfdom, etc. Posed in this way, the problem thus becomes not that of knowing if a new mode of production has emerged or not, but - the question being solved once certain minimal conditions exist together - of knowing at what stage it is in the actualisation of its essential characteristics.

QUALITY OF LIFE AS IMPROVEMENT IN HUMAN RELATIONS

By Massimo Brighi
General Manager LEASCO S.p.A.

In the last two decades futurologists have written extensively on how humanity will live in the future. However most of their attention has been concentrated on describing the application of inventions and innovations im the way of living.
Very recently they have diverted their attention im dangers and limitation of industrial development.

This research has greatly contributed in making humanity conscious of the problems which lie ahead. However, the nature of the variables involved, the interrelation among them, the intricacies of new technologies, the new variables which could enter the models any day, make the probability that the forecasts will happen, just as described, very small.

The main reason why it is impossible to plan ahead or even to predict technical development of any type of society lies mostly on the fact that technological innovations and inventions cannot be planned or ordered. They just happen at random, at no predetermined time, and the consequences of each discovery are beyond the power of human minds to detect, even on short term.

Of the army of scientists today working in universities, around the world, no one can predict exactly what or when they will discover anything.

Of the army of applied researchers today, working on industrial, agricultural and social science laboratories, no one can predict if the effort involved will be useful.

Furthermore it is very difficult to predict the consequences even of known discoveries.

Just two examples: World War II has brought many new discoveries; among them, atomic energy and the elctronic computer.
Immediatel-after they appeared on the scene, market researchers

and many other scientists were in agreement that in the future, let us say in a generation span, computers would have found applications on very limited scale (no more than at most 100 computers all over the world) meanwhile the pacific utilization of atomic energy would have been countless.
Today after 30 years from their appearance, exactly the contrary happened: there are more than 150,000 computers around the world, but the atomic energy has found up to now limited and, from the economic point of view, controversial applications.

Meanwhile a lot of research went on on forecasting future applications of new techniques, very little research has been done on forecasting future human environment or if it has been done, has not received enough publicity or attention from the public at large.

As a result of this trend, the image of the future society that the common man has, is an image of a community which fully utilizes modern inventions for the material way of life, or where consequences of applying irrationally new inventions will make future society more complicated than the present one.

The area of relations among men has been touched very lightly by futurologists. However, the desire and expectation of humanity for the future is not so much on what gadget to use for cooking electronically or to be able to travel at light speed in order to reach planet Mars, but on a new world where relations among men will be based more on mutual trust and friendly attitudes and where each man can fully realize his potential talents.

In order to realize ourselves, it is much more important to anyone of us to be in a human environment in which our personalities are respected, our uman beings can fully develop their full potential. And this of course is a variable independent from the amount and

type of new technologies available to humanity.

In any of the present political systems, organizational structures in the schools, factories, hospitals, prisons, trade unions, political parties, armies, churches, government bodies, are based mostly on authority, mistrust, control and repressive methods. We live in a world which has inherited these structures from the past, and due to inertia and viscosity of human society, they tend to be with us for long time.

Improvement of the quality of life in a future society should come from eliminating the attitudes and behaviours related to the past society and developing in the mean time a new way of dealing with men.

The present crisis of our culture stems from the fact that humanity for centuries and centuries has lived practically in the same manner. During the last 150 years invention and innovations accumulating one upon the other have drastically modified our way of living.

However, the quality of life, meaning the quality of relations among individuals, has changed and improved during the past 150 years, but not as radically and as fast as the material way of living. This fracture between these two catogories is causing a continuous tension to humanity. Eventually a new equilibrium will be reached, when new approaches in human relations will be widely applied to society.

Futurologists should try to shorten the time span for this phenomenon by doing more research in the field of human relations and by giving more publicity to it.

In the industrial relation world, about 15 years ago, Prof. Douglas McGregor of M.I.T. described the industrial environment of present days as deriving from the following assumptions about human nature that he labelled Theory X -:

1. The average human being has an inherent dislike of work and will avoid it if he can.
2. Because of this human characteristic of dislike of work, most people must be coerced, controlled, directed, threatened with punishment to get them to put forth adquate efforts towards the achievement of organizational objectives.
3. The average human being prefers to be directed, wishes to avoid responsability, has relatively little ambition, wants security above all.

Professor McGregor foresaw the possibility of changing the human environment of the entreprise if management would act under a new set of assumptions that he labelled Theory Y -:

1. The expenditure of physical and mental effort in work is as natural as play or rest. The average human being does not inherently dislike work. Depending upon controllable conditions, work may be a source of satisfaction (and will voluntarily performed) or a source of punishment (and will be avoided if possible).
2. External control and the threat of punishment are not the only means for bringing about effort toward organizational objectives. Man will exercise self-direction and self-control in the service of objectives to which he is committed.
3. Commitment to objectives is a function of the rewards associated with their achievement. The most significant of such rewards, e.g., the satisfaction of ego and self-actualization needs, can be direct products of effort directed toward organizational objectives.
4. The average human being learns, under proper conditions, not only to accept but to seek responsability. Avoidance of responsibility,

lack of ambition, and emphasis on security are generally consequences of experience, not inherent human characteristics.

5. The capacity to exercise a relatively high degree of imagination, ingenuity, and creativity in the solution of organizational problems is widely, not narrowly, distributed in the population.
6. Under the conditions of modern industrial life, the intellectual potentialities of the average human being are only partially utilized.

The central principles which derives from Theory Y is that of integration: the creation of conditions such that the members of the organization can achieve their own goals best by directing their efforts toward the success of the entreprise.

Attempts at applying Theory Y in some industrial entreprises have been made with more or less success in the U.S..
However even if all industrial corporations would apply Theory Y, very little results would have been reached in realizing a new society.

Workers going out of plants would find other systems based mostly on authority and on punishment, such as schools, offices, trade unions, public organization bodies, armies, churches, prisons, hospitals. Therefore many efforts should be directed in doing research in applying assumptions similar to those of Theory Y to other fields of human endeavour.

The first place where Theory Y should be applied is the school system, because it is there that we are formed to apply the authoritarian principle.
Some attempts have been made already. This line should be continued and more courage and initiative should be given to experimental schools. In the other fields mentioned above, there are signs that

things are already moving, such as experiments in mental asylums or prisons.

Special attention should be given by researchers to Public Administration. An enormous change is expected in this area all over the world for the following reasons:

1. Up to now government bodies have slown down any type of development due to the principles of bureaucracy on which they are based.
2. A more than necessary percentage of public resources are spent on controlling procedures or past events because mistrust is at the base of bureaucracy.

New types of government organization should be invented, so that resources could fully be utilized to foster improvements of societies.

All these types of research are not as costly as research in advanced technology. Therefore they could be carried out by universities, foundations, and international bodies.
This is a field where nations of the South could give an important contribution, because their thinking could be completely free of western or eastern prejudices.

To summarize our concept of the future quality of life:
it is a "vision" of a society based more on consensus than on impositions, where everybody could put their talents to work to the full extent.
Inner motivation of every citizen will be to serve society, because in so doing he will get satisfaction and will improve himself.

REFLECTIONS ON SOCIAL FORECASTING

By Georges Gueron
Vice-Président Directeur Général
de la Société Internationale des
Conseillers de Synthèse (S.I.C.S.)

President du Centre d'étude des
conséquences générales des grandes
Techniques Nouvelles (C.T.N.)

INTRODUCTION

Men - particularly those who assume responsibilities - have long chosen to base their thoughts, their projects, their decisions and their actions on knowledge of the past. It gave full meaning to their actual experience and offset their ultimate short-comings. To imitate what had already succeeded, if carried out attentively, was the best guarantee for future success.

Today, the same men, on the contrary, wish to rely on forecasts that are scientifically supported. They seek to substitute a future-oriented reference for one that is tied to the past. Is this turnabout justified? And if it is, is the present capacity of forecasting adequate so as to render with reliability the predictions that we know how to establish. And if not, what attitude should we adopt?

1.

The turnabout in attitude is justified. It corresponds to an essential phenomenon of our era. Did not Gaston Berger, the father of futurology, say in an often repeated remark: "up to now, nothing has happened since Neolithic times."

This was to emphasize the profound and rapid changes that are taking place at this very moment. They create - by the increase in social orders of importance, by the acceleration of changes and complexity of situations - such differences between the reality of the past and those of the future that a change in nature, a veritable rupture is at stake. It is as though the future from this point on were not to repeat the past, nor ressemble or prolong it. One can illustrate the implications of these assertions with this example: if one heats water, the temperature rises until it soon reaches the critical level or boiling point. Critical because the temperature at this precise moment remains stable but the water undergoes a change of state. All the thermal energy supplied to the system contributes to bring about this change-over without altering the temperature insomuch as to prevent this conversion from taking place. Then the temperature may rise again. Correspondingly, human societies seem to have reached the critical level when a change-over from one state to another is about to occur. Because of this, knowledge of the previous phase (incompressible liquid, for example) would have little value with respect to the following one (compressible steam), even though we are still talking about the same body - water - which retains the same chemical properties and the same molecular definition. We are likewise always considering men with the same genetic constitution, the same passions, and the same intelligence but who discover themselves in a changing "social state".

This example helps to understand one of the characteristics of the period we are entering. We can compare it to the precise moment when the change-over occurs and during which time

two different states co-exist. That is, the moment when the action of thermic energy no longer produces its normal effect (a rise in temperature) but brings about an unexpected and "unforeseeable" one (vaporisation). It is the crucial period when new concepts will have to replace the old ones even if they contradict them (compressibility - incompressibility; abundance - scarcity).

2.

But does our ability to forecast measure up to such a situation? Absolutely not! As much as knowledge of the past enables the "deciders" of yesteryear to draw up models of action, to have an effective impact on events through close comparison with historically acknowledged similar situations, we are disarmed if a change of state truly occurs and if, instead of being faced with some analagous situations, we are thrust into the future fully unaware of its characteristics.

To be sure, several factors soften the reality of such positive assertions. Two are of special importance: On the one hand, changes brought about by everyday decisions and actions, however rapid and profound they may be, seem with the passage of time to have but a brief impact. And so, all the techniques which improve forecasting and its methods (in the strict sense of the term, what is applied to that part of the future which repeats, resembles or prolongs the past) remain useful on a short term basis. These techniques are becoming more and more effective owing to the wealth and increasing preciseness of measurements and statistics as well as the progress made in collecting and processing data.

On the other hand, the principal cause of changes (those which would create a change of state, a rupture between the past and the future) is known. It stems from the explosive growth of knowledge, particularly in the sciences and in the far-reaching effects of their applications. As soon as difficulties resulting from the newness of situations appear, so do the powerful means to dominate these situations by their determination to engage in the making of the future. Consequently, all creative effort promoting the endorsement of new concepts which may contradict those originating in past experience soon find the instruments for effective action. This was how, for example, the politics of health, population control and ecology came about. Historically, such considerations were dependent on an act of Providence or on the obscure "nature of the species", but surely not on the will of governments.

Both of these comments illustrate that we are passing through a period of transition, from one state of human existence to another. Yet, we are not acutely aware of the difficulties that such a transition represents. If our decisions and actions are to be based on "scientific forecasts", then our reasoning must coincide with a good knowledge of the two states that co-exist and recognize the particular phase in which these two states have become enmeshed. In reality, we hardly know how to go about forecasting and, in particular, social forecasting. If we refer again to the example of heating water, we could say that we are only accelerating the phenomena of expansion so as to measure them at the precise moment when the water starts to boil. Perhaps our receptacle is on the verge of bursting

for lack of a steam vent (Mariotte's laws and compressibility of gas). But we know nothing about the future state of societies! Any judgement that we might make about the value of action taken for the sake of the future will be unreliable for a long time. This will remain so until "experience in the future" can provide us with criterion for such a judgement and a real understanding of the actions taken as well as their consequences.

3.

What attitude should we now adopt? Again, the same example serves to elucidate the problem. Does the harsh and drastic change that occurs between the past and the future contain an invariable? And if so, is it important in relation to the action and its consequences. Man, in so far as an individual, seems to play a determining role. In our example, water, whether liquid or steam, retains its same properties. By the same token, the permanence of man's genetic makeup - although it does have a certain measure of flexibility - conserves a quasi-absolute factor of unchangeability. This irreversibility is apparent in the morphology of the human being: his strengths and weaknesses, his capabilities and limitations, his conscious and unconscious feelings. In so far as a "physical specimen", man is and will remain as long as his genetic makeup does not change Cro-Magnon Man even though as a "social being" he finds himself more and more entangled in an environment and in systems whose increasing complexity and efficiency create a new "social state" very different from the previous one. Accordingly, as concerns what action to take, compatibility between the individual and the social being, between the citizen and society, between the consumer and the producer, should be the foremost criterion of appraisal and the yardstick for the decision-makers.

A criterion for appraisal because in the new unknown state (and the next) of human societies, the well-being of each person - as defined by him, for himself and his next of kin - will ultimately be the basis of his judgement of our era. A yardstick for the decision-makers if (assuming that respect of the human being remains the basis of civilization) the ultimate aim of the decision is to create for the greatest number of people conditions that favor greater intellectual, moral and material satisfaction.

I. CONCERNING NEW CONCEPTS

Are new concepts appearing at this moment? Do they oppose previous ones as compressibility of steam may be opposed to the incompressibility of water? Should man preoccupied by the concerns of the future pay particular attention to these concepts because of the role they are to play in the social organization? It would be impossible to thoroughly reply to such questions. But certain significant remarks might serve as an inspiration and foster individual thought on this subject.

Consider for example the rural type societies which account for the major part of our globe and offer the majority of our world population a traditional life-style setting. We can say that the invention and diffusion of agricultural techniques gave rise to those societies, and brought about the appropriation of land. That is, land that could be tilled was divided among the landowners (individuals or collective) who assumed responsibility for reaping the benefits from the soil. As a result, space in

terms of the terrain and the agricultural operations that it supports, is viewed as a 2-dimensional surface. On the other hand, over the past 100 years, another type of civilization (industrial and urban) has emerged alongside the old one (agricultural and rural). Consequently, the slow transformation of urban space is being carried out on a 3-dimensional scale, over and under the flat plots of property whose landlords are identifiable as individuals or corporate bodies, and who must give their formal agreement before any construction can take place on their property. Moreover, new techniques appear. Those of submarines, aviation are soon followed by the techniques of astronautics and oceanography. They introduce a new concept of space and its use. Should one continue, moreover, to use the same term for such different meanings? Certainly, in mathematics one knows dimensional space, a "concept" that covers different realities: surface, volume and more abstract ones that elude direct representation. In view of the organization of societies, the transition to the third dimension has some consequences. Will the development of astronautics and oceanography lead to the 3-dimensional appropriation of space? How are we to think about space, protect and use it? Would it be a viable notion? Would it contribute to an ethical or esthetic problem? In terms of the organization of societies, is unappropriated space really a new concept? If it is, does it merit our particular attention? In all probability, it will! Particularly if this situation gives rise to new types of action that are unknown to us at this time and therefore cannot be described. We could of course indulge in that utopian fantasy of a patrimony for all of mankind, as if property, the prerogrative of individuals or corporations could be unanimously claimed. What would be the consequences?

Would we first witness the co-existence of two sectors of space, one divided between the landowners, the other not? One can see how the contagion could spread! For example, could we continue, in the name of national property, to deny the inhabitants of poor and over-populated countries (they do exist!) the right to enter the rich and sparsely populated countries (we know some)?

In any case, by losing its original simplicity; the right to "use and abuse" whatever the land could bear, the concept of property is weakened and will weaken further by becoming more complex. Consequently, the organization of societies will be decidedly modified by this weakening.

One can in the same way consider what has become of the concept of time. Because of the evolution in agricultural and rural life, the concept of time became fused with the notion of the yearly cycle. This cycle of 365 1/4 days, based on so-called annual cultures, conditions identical situations and triggers off an "eternal" return to the same work, the same economy, i.e., the same expenses and the same receipts. It had permeated and practically monopolized the concept of time and time measurement to the extent that today or tomorrow, operations that belong to a realm completely different from agriculture - for example, setting up a nuclear power station or NASA's Apollo programs - are expressed in terms of annual budgets and depreciation for want of time units better suited to the very nature of these work projects. Shall we soon be talking in terms of the "duration of human lives" because our social organization will be conditionned by life-styles whose continuity and span would correspond to a biological reality that has surpassed the biological reality of cereals? In any case,

Will this concept of continuous time flowing along from birth until death replace that of cyclical time so that man, to his endless amazement, will never find himself at the same point where he was the previous year?

Will such a change deeply affect or not the organization of societies, the idea we hold of it and the idea of what we can do for ourselves as well as for mankind? If so, is not such a novel concept of time, one that embraces the perspective of continuous economic growth, a staggering notion for those who remain viscerally attached to the idea of cyclical time?

Similar developments could affect other concepts: abundance and scarcity; work and leisure; information and training.

Consequently, we must think about those sectors of the economy which must be rapidly expanded. They are likely in the areas of education, information (use of data processing), health and leisure. The notion of processing things (agriculture, industry, commerce, through work) would be replaced by that of "treating men" through systems that would use less material things, less energy and would rely more on information, intelligence, sociability, other tempos of work and another concept of the employment of time.

II. DIFFICULTIES OF SOCIAL FORECASTING

Whoever accepts the change in concepts on which future societies will be built consequently understands the difficulties of social forecasting. If the future must not reproduce, nor resemble or prolong the past, it seems as if forecasting would require quasi-magical guesswork and would lose the scientific quality that we wish it to have. But if, to refer back to our comparison, we are on the brink of a change of state, there is indeed "a part of things" which is going to reproduce,

resemble and prolong the past. While compressible steam appears at 100 degrees, the water remains incompressible. Likewise, two limited or incomplete areas exist whereby the forecast and the perfection of equipment to sustain the forecast are a vital factor. In addition, technological progress, in its entirety, gives mankind the means to achieve power equal to the magnitude of natural phenomena on our planet. And the availability of such power creates a determined attitude on the part of the leaders and men of action to use it. Consequently, one aspect of social forecasting can be expressed in the form of projects or objectives which serve more as models of a future that we hope to bring about than a description of what we expect to occur by itself. By appraising how these targets are reached or how we get away from them, we not only improve the accuracy of social forecasting but also the capacity of drawing up social projects.

One can thus study and perfect the social forecast. However, we must move cautiously and in two principal ways:

- by realizing that we are dealing in areas (the point where new concepts are going to increasingly appear and develop from self-evident consequences) where the effect of the forecast will be to replace reluctance to change by receptivity. This is far from being a useless role!

- by measuring particularly the risks taken and time required to acquire certainties in areas where changes either in dimension, or acceleration or complexity mask the distant consequences of the action from the forecaster.

Once again, examples to illustrate these statements would be useful. And they need not be numerous as concerns improving forecasting techniques. Two points, however, must absolutely be stressed:

- in the areas where knowledge of the past remains the basis of the forecast, the quality of this knowledge improves particularly with the capacity to quantify numerous data. If - by means of a new phenomenon in the history of mankind - we could avoid the permanent reproduction of what occurred at Babel, if co-ordination of languages and methods of collecting data were to render them compatible with each other, we would have recourse to an unparalleled mass of knowledge. Better still, we would have the techniques for handling information and a way of using them without being completely overwhelmed by their sheer number.

- the second point is undoubtedly of greater importance. It also has reference to the enlarged capabilities of calculation and to the logical processing of data. In fact, we can vary the complex coded models by introducing a great number of hypotheses and parameters which will quickly enable us to find out how the model was affected by these permutations. This is the first case where "the reference of the future" is substituted for that of the past. And one grasps the significance when one understands that nothing can change the past. And so, the "reference of the past" represents only one "run" in the model whereas one can - in theory - project an infinite number of models for the future. All this points out that - when we have good models, which is not yet the case - the quality of forecasting and action for the future will be incomparably

superior to what was based on knowledge of the past or historical experience. To not enlarge upon this point should not be interpreted as underestimating the importance of these new factors. But we do wish to focus on social forecasting, not describe or advance it.

The "social forecaster" must be conscious of the risks growing out of the new powers that science and technology bestows upon mankind. These risks, for example, are symbolized by the atomic bomb and pollution of the environment. This is true because "things" and "action on things" remain the most important and the most determining factor in developing our concepts. Yet we know - if only intellectually and not viscerally - that what affects man is of greater importance. What governs our future is the number of men in relation to the availability and allocation of space; the equality of man in relation to the tapped resources and their allocation; the education of man with respect to violence and his role in the evolution of societies; it is the quality of man's life now that the prospects of abundance extend the horizon of our possibilities beyond anything we have known in the past. In light of all these areas, one can sense why forecasting vacillates. On the one hand, because "when one heats water, it undergoes a change of state instead of just another temperature change", we are dismayed by the observation of this phenomenon as we have no control over its evolution. On the other hand, because "we do not know Mariotte's laws', we come to the realization that long study is necessary to dominate what is occurring. This is true in areas that appear relatively

uncomplicated but where changes in dimension, acceleration and complexity have intervened so as to transform the world. Who would have thought that DDT carried away by the rains and the rivers would later on show up in the flesh of animals in the polar regions? Who - except for a few scholars on whom we turned a deaf ear - would have made a parallel between ecological and economic conditions twenty years ago? Who, in the light of where we are today, justifiably proud of our statistical knowledge, is able to draw "certain" conclusions about what the world population will be at the end of this century, or how man will spread out into every corner of our planet - between the cities and the country - by categories of age and sex, etc. ....?

We are accustomed to think about such subjects by avoiding the hypothesis of any violent crisis (war, catastrophy, acceleration of changes). However, except for biological optimism, what valid reasons do we have to avoid such crises 20 years from now? In view of this, we again see the importance of developing an attitude toward the future and the importance of two principal aspects:

- the "aspect volontariste", which is to say the idea of willing a future whereby immediate action is thought out in terms of the future, both medium and long-range, and (to stress again) in relation to man.

- the "global reflection" aspects which by no means scorns knowledge and its progress. However, it constantly seeks to re-integrate action, its objectives and underlying values into an overall-view, one that embraces the total spectrum of things.

We have insisted enough on the present limitations of social forecasting. Is it not time to consider the keystone to future-oriented action and, from there, develop the different phases of social forecasting in line with progress made in developing the proper attitude toward the future?

III. LA "PROSPECTIVE" (1)

As societies undergo a change of state, the concepts on which we base our reasoning and attitudes likewise deviate. Faced with such an upheaval, we must seek a basis for our certitudes and lay a foundation for action.

Man is likely to be the best point of reference. For the permanence of his inherited characteristics gives him the needed dosage of unchangeability whereas his genetic makeup favorably tempers this rigidity by providing the adaptability factor. We might even postulate that the limits of man's adaptability suggest the limits which should be placed on the rapidity and complexity of changes once we at least know how to control them. Accordingly, compatibility between people and the social organization, between individual happiness and the ultimate aims of this organization would provide an irreplaceable criterion of appraisal and a yardstick for the decision-makers.

Perhaps, for this very reason, we should first consider what type of relationship we wish to establish between abundance and the quality of life. For some people oppose them to the point

---

(1) in the French sense of the term: the opposite of retrospective

of jeopardizing consensus on the most fundamental notions. Without such consensus, no society is able to exist. Then, the task is to show why at this very moment what threatens this consensus is not the search for abundance but a particular social organization which focuses so much on the specialized use of techniques that people find it intolerable. It ostensibly denies them their wholeness, this oneness where the intellectual, moral, esthetic and emotional aspects of the human being converge. Finally, I wish to propose a few ideas on the appropriate means to restore consensus. For they will serve to orient "la prévision social volontariste" (1) and futures research toward projects and actions suited to the new state of societies.

It is in fact very premature to present the pursuit of abundance as the abandonment, refusal or mistrust of cultural, esthetic and moral values. And nothing could be more unjust than to condemn - to the point of rejecting - all modern society for the sake of another without at least attempting to define it before we oppose it. A closer analysis would undoubtedly lead to different conclusions with more constructive applications. If present day societies reveal their inability to integrate essential esthetic and moral elements, this is not, for us, the result of the search for abundance. It is due to our serious failure to recognize the conditions for action.

---

(1) Social forecasting that "wills" the future. Man's role is important in determining the kind of future he wants instead of simply allowing the future "to happen".

These conditions have recently undergone profound changes to the extent that general consensus on the basic principles that relate to how society operates has been affected. For action (but not society) has been drained of any concern for ethics, individual sensibilities and beauty. Two examples serve to illustrate this:

- First, action relates less and less to people as individuals and is becoming more and more concerned with groups (enterprise, states, unions, age groups and socio-professional classifications etc ...). In fact, the whole notion of action is more complex today than in former times. Today, Robinson could no longer remake civilization on his desert island. For manufacturing brings into play equipment and systems that require co-ordinating many people specialized in different fields. Also, the use of collective equipment impregnates an ever-increasing part of our lives: the vast electric network - transportation, broadcasting, postal and telephone services and eventually computers - becomes incorporated into our daily lives, into our most common and usual actions. Or finally because group restrictions are more exacting (the importance of the government budget, the social budgt; proliferation of the bureacracy, rules and regulations; demands on the police who not only must protect the citizen and the nation but also cope with traffic and parking problems, fraud and health, prices and drugs as well as/watch over the daily opening and closing hours of the shops...)

Consequently, people's actions on the one hand do not really further their interests or those of their families. They serve the interests of enterprises, unions, states or in one word, groups that essentially flaunt materialistic ends. They only discuss among themselves matters related to power and money interests. Moreover, within their own group they do not know any other form of sanction (moral or penal). On the other hand, the importance of action which for individuals was traditionally based on financial and penal responsibility as well as moral and social sanctions, is no longer operative. For responsibility is watered down through the chain of people who participated in the study, decision and execution. The sanctions (punitive or remunerative) can no longer single out the "good guy" from the "bad guy". For the sanctions have become entangled with material rules related to security, insurance, tenure, and transfer that aspire to equalize situations and opportunities but likewise decrease the feeling that each person had of assuming sole responsibility for his own fate and that of his family. (1)

Finally, action that is so divorced from individual concerns takes on a purely professional character and, in particular, alienates itself from the culture and from the civic virtues that should serve as the basis of any action.

- The second aspect which concerns the change in nature of action springs from specialization. Its beneficial effects on

---

(1) This statement concerning the modes of action and sanctions is in no way a criticism of the equalization of opportunity.

production and cost have their serious counterparts. For it is not only in the area of production where specialization has become a way of life. The sociologist in his research and forecasts also applies the techniques of specialization to man. In fact, once we wish to measure and quantify man's actions and behavior, we are led to treat him like a thing. Statistics, market research, polls and surveys deal with the voter, the tourist, the detergent buyer, the motorist and the legislator etc. ... labeled as such. But we fail to recognize ourselves under this isolated aspect. For we are, in the total spectrum, all of these things together and indeed quite something else again! Consequently - for social forecasting and action - we count our fellow-men by fitting them into specialized slots which describe them and their behavior only in terms of large numbers but never as individual human beings.

These two examples show how the evolution of the conditions for action can have serious social consequences. We cannot be surprised if people - as individuals - refuse society or at least protest against it since they are considered - in the light of who they are, what they do and the role they play - as being narrowly specialized. Thus they become depersonalized units, stripped of their personalities. Accordingly, any agreement between social sanctions and those of their individual conscience is dissolved. Faced with the complexity of the social and professional organization, the young people about to enter the adult world feel lost. For they have been brought up and educated (in their families and at school) as individuals, sheltered from the complexities of action. To the contrary, their initiation into the adult world classifies them (in terms of a profession) into groups which lay claim to them

as specialists and not as individuals. Brought up as individuals, they suddenly become dismal specialists - shocked, worried and poorly esteemed.

What is of concern is not abundance but a social organization which has excessively simplified its pursuit of technological efficiency in order to obtain abundance. Wouldn't it be possible to "complexify" the social organization a little more so as to serve less simplistic ends? Perhaps it is only a matter of bringing man to a higher level of consciousness. Or, perhaps, to the contrary, we must dramatize these thoughts more through a proper attitude toward social forecasting. For, the actual life of people and societies does not unfold in a spirit of objective observation nor in the silent calm of reflection. Life on a world scale develops along the lines of competition (economic and political); war (military or guerilla); fear and violence (racism, street crime and civil repression); absurdity (waste and stupidity); change (moon walks and underwater habitats); generosity (spontaneous gestures from the heart and exuberance for life).

At the very moment when the old dream of abundance and the more recent dream of a better quality of life have been declared by the optimists to be within reach, the pessimists have also made their voices heard. And so, we cannot say in what direction the world will head. But it is obvious that the optimists need to find a consensus in favour of societies attentive to a better quality of life. However, it would appear that such consensus is more and more lacking when we stop for a moment to observe

the present organization of societies. For the predominance that they now give to specialized and materialistic ends unquestionably opposes societies in search of a life-style that is more humanly desirable and thus - perhaps without much thought - strongly and definitively says "no". Hence the importance of La Prospective: an attitude toward action which takes into account the characteristics of the future in relation to man.

This definition stresses that La Prospective is research. And, like research, it remains open, receptive and attentive to changes.

We have said that it implies seeking an attitude toward action. This dismisses an established and unbending doctrine which would hardly suit our purpose when we consider how ignorant we are of the "future state" toward which human societies are moving. La Prospective also implies - by the very vagueness of the word attitude and its association with the word research - a state of readiness as we anticipate the unknown and the risks of the future. Moreover, the aim-action intimates the will to do and thus to remain pliant in a deliberately cautious way.

It is an attitude toward action which takes into account the characteristics of the future, which is to say that it is sensitized to changes which are becoming more and more apparent to those who reflect upon the significance of our era. Thus, it remains open-minded toward new concepts and receptive to changes of dimension, acceleration and complexity. It is equally attuned to the numerous problems that could have world-wide and planetary implications as well as to the effects and use of new powers. By the same token, it must remain aware of

the consequences that such modifications could have on traditional concepts. One reservation, but an important one, is expressed at the end of this definition.

It is, in relation to man, a reference to the unvarying individual, all that forms his being, whether or not he is conscious or unconscious of it. It is reference to individual values which, as each person well knows, relate to certain notions of dignity, liberty, autonomy, and equality. These are notions that any organized society must sufficiently respect and promote in order to contribute to individual happiness at the very moment when increasing material resources are within their reach. It is also, at the same time, a reference to man - within the context of his time - contemporary man swept away, at the very moment when societies are undergoing a change of state, by a movement which can lead to the advancement of the species or to the downfall of civilization.

CONCLUSION

If these commentaries have been advanced in a spirit of objectivity, how should one conclude? Social forecasting, given its present status in the social and political sciences, does not rest on as strong a basis as that of technological forecasting. Projects that social forecasting is able to draw up are thus less reliable and will remain greatly debated. In addition, the period, that of a change of state in societies, renders social forecasting all the more uncertain but also more useful and desirable. We can only hope that it will be enterprising, imaginative and cautious - never failing to question what it is doing. Above all, social forecasting must always take in a perspective that is wider than that of an isolated project devoted to specialized studies.

For that reason, "la réflexion prospective" will be the best cornerstone. And if whatever is required to engage in the making of the future means that many different people be associated with the research or project, let us hope that the sponsors - the men of action - remain forever mindful of this alliance. It will be the condition of progress.

BASIC ISSUES OF SELF-MANAGEMENT

By Mihailo Markovic
Philosopher

The following two questions seem to sum up most controversies about the idea and existing practical experience of self-management:

(1) What is self-management?

(2) How to reconcile the principle of self-management and the principle of efficiency in a modern economy?

That the former is a real problem follows from the fact that the term "self-management" is being used in a very indiscriminate way, covering a number of different social forms which in fact lack some necessary conditions to be classified as self-management.

Thus:

Worker's control is by all means an important, progressive objective in a class society. And yet it may only contribute to preventing undesirable decisions, it is still far from determining a positive policy in enterprise and local communities.

Worker's participation is also a progressive demand that has been gaining more and more ground in the international labor movement. And yet this is a broad, vague demand and in various forms could be accepted by the bourgeois ruling class within really affecting the general social framework of a capitalist society. Because: workers might be given rights to participate only in decision-making on some matters of secondary

importance; they might be in minority in a given body of management; they might be allowed only advisory or consultative functions and not the rights to take decisions; finally, they might be denied access to information and left in the position to only endorse decisions that have been prepared by others and presented without any real alternatives.

Dictatorship of the proletariat, which in Marx's theory referred to a transition period of increasing democratisation, is nowdays associated with the existence of a strong, centralised autoritarian state which is actually in the hands of political bureaucracy, and which uses the phrases "the power of Soviets" or "worker's state" in order to conceal and mystify the real oppressive nature of social relationships.

However, the idea of self-management should also not be mixed up with the idea of a mere decentralisation: An atomised, disintegrated society, lacking necessary coordination and conscious regulation would be at the mercy of blind, alienated social forces. Self-management is surely not the absence of any management and conscious direction within the society as a whole.

Here we come to the second question mentioned above. The most customary objection against self-management (as some form of social system in which people themselves somehow take care of matters of common interest), is that such a system is incompatible with the demands of technological efficiency and rationality in a complex modern industrial society. The argument is: Self-management is a noble humanitarian idea but it cannot be brought to life because workers and ordinary citizen are not

educated enough to run a modern state and a modern economy. Professional experts are needed to do the job. Therefore self-management is either a utopia or must be reduced to a rather limited participation in decision making.

This kind of criticism surely overestimates the usefulness of the technostructure and expertize in decision-making on crucial social problems. But it points out at a real problem which can be resolved only by developing a rather sophisticated model of self-management-which leads us back to our first problem.

x

The idea of self-management rests on a more general philosophical principle - that of <u>self-determination</u>.

Self-determination is a process in which, conscious practical activity of human individuals becomes one of the necessary and sufficient conditions of individual and group life. This is a process contrary to external determination, ie. a process in which necessary and sufficient conditions of the life of some human individuals are exclusively factors outside their control and independent of their consciousness and will. To be sure self-determination is always conditioned by a given social situation, by the level of technology, the given structure of production, the nature of political institutions, the level of culture, the existing tradition and habits of human behaviour. However it is essential for determination: (1) that all these external objective conditions constitute only the framework of possibilities of a certain course of events, whereas upon the subjective choice and conscious human activity it will depend

which of these possibilities will be realised; (2) that the subjective choice is autonomous, genuinely free and not heteronomous and compulsory. This means that the subject by his own activity creates a new condition of the process, instead of merely repeating time and again an act to which he was compelled or for which he was programmed. This act need not be arbitrary and groundless, it should be an act of self-realisation, of the actualisation of basic human capacities, of the satisfaction of genuine human needs.

This active role in the course of events, this creation of new conditions instead of mechanical reproduction according to the laws of the system and inherited instincts, this extension of the framework of possibilities instead of permanently remaining within that framework, - is a specific power of men, characteristic of every human individual, present at least in the form of a latent disposition.

Under certain social conditions this power can be alienated. It will be concentrated in the hands of a privilleged social group and becomes its monopoly. Alienation is a consequence of: (1) the division of labor, (2) the accumulation of the surplus-product, (3) the creation of institutions the function of which is to take care of common social interests, (4) increasing mediation between the individual needs and the needs of the whole society.

Political and economic alienation involves a process of social polarization which on the one pole transforms conscious, potentially creative subject into an object, into a

reified, oppressed and exploited mass, whereas on the other pole it transforms a normal, limited and fragile human subject into an authority, into a mystified entity that has supernatural power and control over human lives.

Such a critical analysis leads to the question: under what social conditions the life of individuals and communities would be less and less reified, less and less contingent upon external authority, and more and more self-determined. There are four such basic conditions:

First such condition is negative: coordination and direction of social processes must no longer be in the hands of any institution that enjoys the monopoly of economic and political power (such as the capital, the state with its coercive apparatus, and the party with its bureaucracy and hierarchy of power). People themselves must decide about all matters of common interest. And this is possible only if the society is organised us a federation of councils composed of non-professional, non-alienated representatives of the people at all levels of social structure: in the enterprises and local communities, in the regions and whole branches of activity, finally, for the society as a whole.

Second condition of self-determination is reliable knowledge of the situation, of its scarcities and limitations, of the existing trends, of the conflicts to be resolved, of the alternative possibilities of further development. Freedom is incompatible with ignorance or with biased perception of reality. The right to take decisions without previous access to information

is a mere formality: self-determination becomes a façade behind which a real manipulation by others, by political bureaucracy and technocracy takes place. Therefore a genuine self-determination presupposes the formation of critical study groups at all levels of social decision making, from the local community and enterprise to the federation as a whole.

Third condition of self-determination is the existence of a powerful, democratic public opinion. The genuine general will of the people can be formed only through open communication, free expression of critical opinions, and dialogue. It is clear, then, that any monopoly on the mass media (either by the big business, or the church, or the state, or the Party) must be dismantled. Such a monopoly enables a ruling elite to manipulate the rest of the population, to create artificial needs, to impose its ideology and to rule by consent of a "silent majority". Therefore mass media must be free and genuinely socialised.

Fourth condition of self-determination is the discovery of the true self of the community, of the real general needs of the people. This condition is basic and most difficult to achieve. Therefore, most of what passes under the name of freedom in contemporary society is only an illusory freedom: mere opportunity of choice among two or more alternatives. But alternatives are often imposed, choice is arbitrary and even when it has been guided by a consistent criterion of evaluation, this criterion is hardly ever authentic, based on a critical, enlightened examination of one's real needs and one's long-range

interests. This condition clearly assumes a universal humanist point of view, and practically implies creation of a new socialist culture and a humanist revolution of all education. Discovery of one's self, of his specific individual powers and potential capacities, learning how to develop them and use them as a socialised human being that cares about the needs of other individuals- would have to become the primary task of a new humanist education.

Preceding analysis clearly indicates that the transition from reification and external determination to freedom and self-determination is a matter of a whole epoch.

Existing forms of self-management, seen in this broad historical perspective, are surely of great revolutionary importance but they should be regarded as only the initial steps. With the general material and cultural development many other steps would have to be made, many present limitations would have to be overcome. Thus, organs of classical state (in the sense of an instrument of class rule) would have to be replaced by the organs of self-management composed of the worker's delegates who are democratically elected, replaceable, rotateable, and by no means corrupted by material privileges and the luring career of a professional politician. Planning would have to be a synthesis of decentralised and democratic-centralist decision-making. Market economy, with its production for profit, would have to be gradually replaced by production for genuine human needs. With further technological advance productivity of work will quickly increase while, at the same

time, present-day hunger for consumers' goods will by replaced by entirely different aspirations. Present-day overstressed concern about production and management will naturally tend to diminish. Self-determination in various other aspects of free and creative praxis, will naturally gain in importance:

x

There are two possible way, in which a humanist philosopher might challenge the very idea of efficiency.

First, he might argue that beyond a certain high level of technological, economic and cultural development efficiency will begin to lose its importance. After all, efficiency in its present-day meaning is ability to produce a desired result, to perform well a certain defined role in the social division of labor. In a highly developed future society automata will increasingly replace man in routine physical and intelectual operations. As "production of specified, desired results" and "performance of well defined roles" are typical routine activities, it would follow that man will let computers to be efficient instead of him, and he will engage more and more in the production of unique, beautiful objects, and in playing new, surprising, not-in-advance-defined roles. In other words he will engage in praxis, and in praxis the question of efficiency either does not arise at all, or is of secondary importance.

Second, it might be argued that the concept of efficiency is devoid of any humanist meaning. It is apparently value-free and ideologically neutral. On closer scrutiny,

however, it turns out ideologically loaded and encouraging certain harmful and dangerous attitudes toward nature and existing society. Maximum efficiency in conquerring and controlling natural surroundings means a dangerously growing rate of waste of scarce material resources and available forms of energy. Maximum efficiency in running present-day social organisations and institutions means full-scale endorsement of their inhuman, degrading practices. For unjust systems efficiency really is their best chance of survival.

Under given assumptions this critique is perfectly sound. In a highly developed future society both material production and the maximisation of efficiency will become social goods of secondary importance. But they are still primary concern of every present-day society. Man will liberate himself from too well defined and ordered roles in material production and will afford to relax about efficiency only when he masters it, when he catches hold of it to such extent that he will be able to relegate it to machines.

And even then there is a sense of the term "efficiency" which will always be associated with achievement of goals of human activity, whatever these goals might be.

Which leads us to the second argument. From the fact that "efficiency" is a neutral concept it does follow that it could be - and as a matter it is - associated with all kinds of wasteful irrational and inhuman practices. But it also follows that its meaning would be entirely different with respect to progressive and rational human goals. After all, no theory and

no program of social change is possible without some neutral concepts. There is an element of neutrality in most concepts, including self-management. There is no guarantee that self-management will always, in itself, make people happier, more rational, less alienated. It is only part of a complex project - not the absolute.

x

With these qualifications in mind one has to take the problem of compatibility of self-management with efficiency quite seriously. While dozens of countries average one hundred dollars of national income per capita or even less, while there is still poverty of the large segments of population even in Europe and Northern America, while human beings still spend their best life energy in boring, technical work, further increase of efficiency is a necessary condition of human liberation and possible self-realisation.

Human liberation is certainly inconceivable without the right of every individual to participate in social decision making. But is it really the case that full, meaningful participation of each citizen destroys efficiency?

This does not happen if the following three groups of conditions are satisfied:

(1) The first group follows analytically from the very concept of integral self-management, Worker's council's in the enterprises and the councils of local communities are not isolated atoms but elements of a whole network at different

levels (from the territorial point of view; local-regional-federative; from the professional point of view: basic unit - the whole enterprise - the branch - the community of all producers).

Any individual has direct decision-making power in the basic units where he works and where he lives, and, in addition, he has an indirect decision-making power at higher levels through his delegates (freely elected, rotateable, always replaceable, responsible to him). Any unit has all necessary autonomy and responsibility for the decision-making on matters of its specific concern. But there must also be a readiness to cooperate and harmonize interests with other units of the system. On the other hand, higher level organs of self-management must have maximum possible understanding for the particular interest of each sub-system. They are vastly different from the organs of the state in so far as they are not instruments of any ruling ellite, they dont oppress, and tend to reduce interference to minimum. But in matters of common interest, after a certain policy has been widely discussed and accepted, its decisions must be binding. Otherwise, social life would lack a minimum of necessary organisation and coordination, and would tend to disintegrate.

(2) Another group of conditions follows from the general characteristics of self-determination discussed above. Organs of self-management operate in a field characterised by the following features: Mass media of communication are free,

they contribute to the creation of a genuinely democratic public opinion; political parties in the classical sense are absent but there is a plurality of various other forms of non-autoritarian and non-manipulative political organisations, and there is an ongoing process of education and raising socialist consciousness of all individuals.

(3) The third group of conditions under which the principles of participatory democracy and efficiency would be reconciled derives from the analysis of the basic stages of the process of decision-making and of different kinds of knowledge and competence needed. Each rational technical decision presupposes (a) a critical analysis of the situation (including scrutinizing the effectiveness of policies adopted in the past), (b) a long-range program of development, a set of basic goals of the organisation, with respect to which all concrete technical decisions would constitute the means. In other words, there are three distinct necessary functions in the process of a rational decision-making: One is <u>fact-finding</u>, <u>analytic</u>, <u>informative</u>. Another one is <u>governing</u>, <u>political</u>. Third one is <u>technical</u>, <u>managerial</u>. Accordingly there are three distinct kinds of knowledge relative to these functions: factual, theoretical, knowledge, (<u>know-that</u>); knowledge of the basic needs of people in a certain situation (<u>know what</u> is good and just to do); technical knowledge of the ways in which basic decisions can most effectively be realized (<u>know how</u>). Thus, in addition to the organ of self-management composed of wise, experienced persons who understand the basic needs at a given moment (who

know what could and should be done), there must be, on the one hand, a group of analysts who critically study the implementation of adopted programs and the changes in external and infernal factors, and, on the other hand, the technical management, composed of people who "know how", who elaborate concrete alternative policy proposals, and who try to bring to life decisions of the organ of self-management in the most efficient possible way.

In this complex structure the rechnocratic tendencies are the main danger for self-management (To be sure, while there is still state and a ruling party, much greater danger comes from political bureaucracy. However we are discussing here a model of highly developed, integrated self-management in which the functions of the traditional state and authoritarian party have been taken over by the central organs of self-management). A permanent source of technocratic tendencies is the fact that it is the managers who hold the executive power, who usually have better access to data and who, therefore, might try to manipulate the self-managing council. Excessive power of the managers, the executives, is dangerous because their understanding of social needs might be very limited and their scale of value very biased, giving priority to typicallv instrumental values of growth, expanion and order. Concratry to a common prejudice that modern society requires the rule of experts, the truth seems to be that experts are the least qualified candidates for good, wise, rational rulers, precisely because they are only experts, and their rationality is only technical.

Self-management has at least three powerful possible devices to resist manipulation by the technostructure: (1) independent access to data, (2) the iron rule that the management always prepares its proposals for the organ of self-management in the form of alternatives among which to choose, (3) the right to elect, reelect or replace the manager.

The organ of self-management must have its own informative and analytic service, and not depend on the manager. Otherwise, it will be at the mercy of the half truths produced by the management whenever it is interested in having its own particular point of view adopted.

The organ of self-management must, time and again, assert its right of freely taking a decision after carefully examining other possible alternatives. Once it is reduced to an institution that merely votes on the proposals prepared by the management it clearly becomes a victim of manipulation.

In order to keep the balance and to be able to assert its rights, the organ of self-management must have the power of rotating the manager. There is no real danger that a "primitive", "ignorant" worker's coucil will fire a good, efficient manager. The experience of Yugoslav self-management is that if the worker's coucnil ever fires a manager this is either because he is utterly incompetent or because he is too autoritarian (or both). But the real danger is rather that the workers use this right too rarely or too late, after considerable demage has already been done, and the enterprise operates with heavy losses. This reluctance to react promptly

indicates that what jeopardises the efficiency of production in socialism is rather too little then too much of worker's participation.

A developed self-management has the historical chance to overcome both wasteful and irrational models of contemporary efficiency: one imposed by the capital and the market, the other dictated by the autoritarian political machine.

- - - - -

MODELS OF QUALITY OF LIFE. NEW SOCIETIES

By Rosa Menasanch
Club de Amigos de la Futurologia
Barcelona

The future offers us several alternatives. Mankind has never possessed so much power as it does now, both constructive and destructive power.

We must therefore first choose between these two alternatives, I do not believe that the destructive alternative interests us more than as a means for preventing what could happen.

According to studies carried out by several specialists, the human being's performance is only a tiny part of what it could be. His brain only works partially. Therefore, an option towards this constructive alternative could be the study and maximum application of the full development of the human personality by means of Oriental and Occidental techniques.

Mankind must set itself some goals. It must view the problems in their entirety, and apply a system of education which permits this broad and integral development of human personality.

If the means of education were renewed it would be easier to employ these new techniques in infancy, and awaken then this ceaseless stimulus and urge to know and discover new things.

For this to happen society should be changed. There should

be a complete cooperation between school-family-community. Maximum value should be given to the freedom of the human personality, and its education and integration into the machinery of life facilitated.

Paths of study and research should be opened for everyone. Every human being should be made to feel the importance of his own creation. Each and every one should become aware of the true value he represents in the collective machinery, and assume responsibility for himself, for it is only with people th are responsible for their own actions, inwardly free, healthy and creative, that e better world can be built.

What can we do to achieve this aim?

There are several choices. They can be studied and those that interest us can be selected. But we must be practical and realistic. There are many created interests who are opposed to human progress, but we should not let ourselves be discouraged by this.

We futurologists work for the future, and we must do so efficiently. We can creat public opinion and a state of consciousness favourable to the changes that have to be effected, by employing various methods.

a) Investigating, whith the aid of the new techniques, more rational ways of life, as much human as industrial, urban and agricultural.

b) Investigating new methods of education, which will interest everyone.

c) By getting people to become interested in the problems surrounding, and in the way of finding practical solutions to those problems.

d) Promoting the creation of groups of futurologists to present new life models and plan the creation of new societies, for application and implementation in practical life, taking advantage of all existing experience and energy.

e) Creating a World Association of Futurologists to coordinate, stimulate, diffuse and put into practice the projects, work and studies carried out by local, regional or national groups.

Some action groups could be set up to prepare courses on these topics. Studies and research work could be carried out, and made as widespread as possible. These groups could get in touch with the leading groups in each country, and get them interested in putting into practice the studies that have been carried out.

The press, radio, television and other means of communication could be utilised to get public opinion interested in these topics, and conferences, round tables, interviews, etc., could be held to promote a state of consciousness on both a national and international level that would be favorable to the new directions.

This is our contribution to the Conference. The proposi-

tion of setting under way an action plan that is practical and which will make it possible to create a better future for mankind.

THE FUTURE OF VIOLENCE

By Gordon Rattray Taylor
Writer

I HOW MUCH VIOLENCE IS TOLERABLE ?

We have created a society which is incompatible with the presence of highly aggressive individuals.

Firstly because human strength is now assisted by ever more powerful weapons and devices. A man who went berserk in the dark ages might kill one or two people before he was overcome. Armed with a rifle he might kill twenty. Armed with explosives he can kill hundreds, and when micronukes are available he could perhaps kill thousands or more. To-day any schoolboy can build a laser which could blind a man at several miles range; before long lasers will kill, bring down aircraft, stop cars. Bacteriological knowledge, to take another example, makes it possible for a single individual to threaten the lives of thousands or millions. There are numerous chemicals (thalidomide is an obvious example) which a maniac could insinuate into the environment which would cause illness, malformations, cancer, etc. Still more serious is the possibility of seizing radioactive materials and placing them where they might do harm. In addition to the ease with which cancer could be induced, neutron beams could be used to weaken metals in key structures, e.g. control-cables and pipes in aircraft. And so on.

Secondly, there is the fact that the spread of education steadily enlarges the number of people who know of such possibilities and enables them to find out how to exploit them. In the past only a minority had access to scientific and technological know-how, such as it was.

The manufacture of explosives and explosive devices in Ireland (and elsewhere) is only a foretaste of the way in which aggressively disposed persons can exploit society in an age of universal education. The laser may provide the next example.

Finally, the technological society itself is more fragile. It depends on a high degree of co-ordination for its continued existence. The breakdown of communications, transport or power supplies could bring it temporarily to a halt. Thus a bomb detonated in the air-traffic control centre for Southern England could ground much of the air-traffic of northern Europe, as well as causing incidental collisions and crashes. In Britain destruction of a selection of Post Office communications towers would eliminate the bulk of long-distance telephone calls, seriously handicapping industry, and perhaps the country's defence system. British electric-power supplies are controlled by about a dozen 'grid' control centres. Destruction of a number of these would not only bring industry to a halt but might mean the evacuation of cities, since inability to pump water and sewage would render them not only uninhabitable but liable to plague. Other countries similarly.

It may be said that bombing from the air has not usually made cities uninhabitable or brought industry to a halt, and it is true that emergency measures would cushion the impact of this kind of violence. However, in war-time, attack is expected, emergency arrangements are in position and on stand-by, and military aid can quickly be drafted. In peacetime, the terrorist would have the advantage of surprise. And even if normality could be restored in a week or two, we still do not wish to live in a

society disrupted in this kind of way at frequent intervals. The inconvenience caused to air-travellers by searches, and the expense caused to airline companies, as a result of a few dozen hijackers provides a paradigm of the way in which society is now vulnerable. As long as technology becomes more complex and more widely used, this vulnerability must increase. (The possibility of damaging or misusing computers have not yet been explored. The entire tax system of a country, as well as its police operations, are put in jeopardy by the fact that computer memories can be wiped out).

Incidentally, the argument need not be confined to deliberate destruction and the use of weapons. The driver of a car can cause the deaths of several people owing to the energy (momentum) under his control. A careless horseman would be unlikely to kill anyone. Any gardener to-day may have on his shelf lethal pesticides which a pre-technological gardener did not possess and so could not misuse.

When complaints are made about current levels of violence, it is often asserted that there were even more violent periods in the past. This seems to me an irrelevance. There were also epidemics of smallpox in the past; this does not mean that we should not keep smallpox to a minimum to-day. And to the extent that we are more vulnerable, we have additional cause to do so.

Moreover, this assertion seems to carry an implication that violence is 'natural' and that therefore it is vain to attempt to minimise it. In point of fact the level of violence is not constant. We can see this best by making an anthropological survey. We find some societies (such

as the Eskimo or the pygmies of Buganda, or the Turahumara Indians of the Sierra Madre Occidental) in which violence is very rare; and others (such as the Qolla of Mexico or the Yanomeno of Brazil) in which it is a way of life. The argument that violence is 'natural' ignores the fact that most animal species are non-violent --- intra-specific aggression is only found in vertebrates and arthropods.

Natural or not, it is incontrovertible that over the past half-century, at least, violence has increased in most western countries. It is common knowledge that cities like London and New York are less safe than they were, and police records confirm this. In the U.K. violent crime in 1972 rose 11.5% over 1971; trebled since the '50s. (Arguments are sometimes advanced that the increase is only apparent, being due to better reporting but do not convince.) Episodes like those at Lydda Airport or the Olympic games have no precedent in modern times. The coupling of vandalism with burglary is a relatively new development. Governments, too, use torture and brain-washing in countries where such methods would have been unthinkable half a century ago.

Thus the fact that violence-levels were once lower suggests that <u>some</u> improvement on the present position is possible in principle.

(I have used the common term violence, but strictly this indicates only the display of force. (Thus a storm may be violent.) We are concerned more with aggression, which implies an actor with a selfish end, and a human victim; perhaps also an emotional loading of anger or resentment. We do not speak of a surgeon as being violent merely because he amputates.)

II. CAUSES OF VIOLENCE

If it is agreed that the level of violence should be minimised, we first need to understand the causes of violence, which are complex. Such understanding is also necessary in order to determine whether the trend is likely to continue.

Obviously in a short paper such as this it is impossible to offer a comprehensive treatment of the causes of violence, a subject which has filled lengthy books. Nevertheless, certain key points should be made.

In recent years, there has been prolonged controversy between two views. Some have maintained that aggressive behaviour is 'instinctive' i.e. that man has an inborn need to be aggressive and that if outlets are not provided, the pressure simply mounts until the aggressive urge bursts loose. A widespread rival view (due to Dollard & Miller) (1) is a reaction to frustration, i.e. is situation-dependent. If the first view were correct, the only workable policy would be to provide ritualized opportunities to express violence (games ? mock-battles ? destructive activities ?); if the second, this would be quite the wrong policy. Indulgence of every wish would be necessary.

A more sophisticated restatement of this view is to be found in J.P. Scott's (1956) theory that violence is a response to stimuli (the so-called psychophysiological theory, in contrast with the 'hydraulic theory' of a steadily mounting pressure.) (2) The stimuli evoke anger

and fear and these are seen as providing the motive for aggressive behaviour. This explains one or two facts which the hydraulic theory ignores but does not explain why fight is chosen in preference to flight. On this theory, sublimation and catharsis are ruled out as means of dealing with violence. The only course is to eliminate the stimuli.

Resolution of this dispute is obviously essential. In my own view, the hydraulic theory is invalid. However, all living creatures have a built-in tendency to cope with the environment, and higher animals seek to manipulate it. This is seen as 'violence' by the victim of manipulation. Further, there are mechanisms which cause us to increase the pressure if first attempts are unsuccessful, and which evoke emotional involvement. To the extent that violence results from such coping, it is clear that we cannot respond by 'catharsis' or by 'removing the stimuli'. We can only respond by offering more suitable means of coping. In plain words, mugging will not be prevented by removing the victims or by competitive sport or sadistic films, but by providing a more appropriate way of life for the mugger. Revolutions will be avoided by making non-violent social progress possible.

The point may seem obvious, when put thus, but a great deal of expert writing on the subject of violence ignores it.

Another view, popular in the U.S., asserts that agonistic behaviour occurs because it has been rewarded in the past --- a behaviourist view.

While it is obvious that reward encourages the behaviour rewarded, so that this is certainly a factor, this theory fails to explain such facts as that animals which have never fought before (e.g. because they have been brought up in isolation) will spontaneously start to fight. (The relevance of learning will be discussed further in the next section).

The trouble with all these theories is that they over-simplify a process which is more complex than their advocates admit; human nature is devious and purposes may be non-obvious, or actually unconscious, so that even the actor mistakes his own motivation.

III. SEVEN TYPES OF VIOLENCE

Because of this confusion, I propose simply to offer, as a basis for discussion, a pragmatic list of seven types of violence, each of which I believe has a distinct causal mechanism; hence each requires a different remedy. (In practice, of course, mixed cases may be found and additional minor causal factors may be involved.)

1. RAGE: Most studies of violence concentrate on cold-blooded violence and instrumental violence, ignoring rage, except in its institutionalised forms such as berserk, amok, Arctic madness, etc. However, individuals in cultures which do not recognize such patterns may suddenly 'take leave of their senses' and commit murders or destroy property.

The causes may be termed neuro-physiological (cf. the brain tumour which affected the Kansas City slayer). Neurological imbalance is probably far more widespread than is assumed, in the current vogue for psychological interpretations. The subject will therefore be discussed further below.

2. RESENTMENT: Psychiatric literature is curiously weak on this widespread motivation. Parker cites an Irish boy, resentful of his bastardy, who said: "I wasn't wanted right from the start --- that's plain enough for sure, and I think it makes you grow up on the defensive and hating other people because you know you're not a fully fledged member of their society. So you turn your back on it. You think 'Oh, sod the lot of them ...' and he added "I hate everybody, that's the fact of it; and most of all I hate myself. Hatred, violence, I'm full of it. I think if I had the chance I'd destroy the whole world." (4)

Repeated work with delinquents has established that unloving, absent and/or manipulative parents give rise to offspring who are themselves inhibited in giving or receiving love and who, in addition, harbour intense resentments which persist throughout life, and are frequently generalised into a hatred of all mankind. (Where only one parent is rejecting, we may get the anti-man attitude or the anti-woman attitude --- though the dynamics are complicated by the Oedipus situation.) Father-rejection, especially in males, tends to manifest as a rejection of all established authority and of customary standards and ways of doing things --- an attitude rather common to-day in the west.

As adults, such individuals tend to join revolutionary and anarchist movements, or to reject the system altogether (drop-out). They may then claim to be motivated by the wish to reform society, correct injustice or build a better world, when their overriding motive is to destroy the world and life-pattern of their fathers. It is noticeable that many revolutionaries seem more interested in sweeping away what exists than in devising anything to replace it.

It follows that such individuals will not be mollified by social change introduced by the older generation, however effective or successful they may be. The interest in social reform is simply a rationalisation of their wish to express resentment. (Obviously this does not mean that social injustice should not be put right, nor that no reformers are sincere. It does mean that therapy is essential, where subjects are open to therapy; and that steps to prevent the formation of these warped personalities are indispensable.)

Further, the blunting of emotional capacity (schizoid in character) enables such persons to hurt or destroy individuals in the name of revolution without compunction or remorse. (cf. the butchering of headmen in Korea and Vietnam, to scare others into compliance.)

3. EGO VALIDATION: People rather often commit crimes in order, as they say, to 'be someone'. Thus a 19-year old boy wrote: "I feel so frustrated at times I feel like destroying everything in sight...if I read about a big job being done or a murder, I want to do the same, so that people

will know I'm equal to anyone...I can't stand being taken a figure of no account." (5) Even Arab terrorists, whose motive is ostensibly political, have been known to make a similar comment. Indeed, people sometimes confess to crimes which they have not committed for the same reason.

The desire to achieve an unique identity seems particularly strong in our society, perhaps because it is highly anonymous and the preoccupation with being 'a personality' as we say, reflects the same need. Ego-considerations also enter into racial questions and account for class-feeling. The desire to protect status often causes a minor dispute (e.g. between a youth and a policeman) to escalate into violence, as Hans Toch has shown.(6)

4. MATERIAL GAIN: I include here not only robbery but the murder of a spouse, or rival, and so on. Where the two previous items arose from the ego, this derives from a super-ego effect, perhaps coupled with unusually strong drives from the id, in Freudian terms.

5. IDEOLOGICAL ENDS: Motivation which is at least ostensibly unselfish --- as in terrorism for political ends, torture for theological ends (cf. the Spanish Inquisition) and the like. In practice of course such actions may in reality be powered by resentments, sadism, or ego-considerations, the social purpose merely acting as an excuse or rationalisation. However, genuine identification with a cause clearly exists. In such cases, the threat of punishment has little effect.

6. 'AIMLESS' VIOLENCE: This includes much vandalism, and is often explained by saying 'We were bored'. In the city where I live, six youths recently savagely kicked a 16-year old girl who happened to be passing, so that she had to be taken to hospital, and passed on laughing. They were bored.

Modern society has provided young people with leisure (and they are no longer exhausted by long hours of physical labour or inadequate diets as in the past); and it has alerted their minds; but it has not taught them how to fill their leisure or provided the institutions which would help them to do so on anything like the scale required. (As one delinquent, cited by Mayo,[7] wrote: "They need something to occupy their minds.") Moreover, it is necessary to fill leisure with activities which are meaningful in terms of life purpose. To sail a boat or rock-climb proves one's competence and resources, at a time when young men are anxious for such proofs, in a society which has abolished rites de passage. And as Patricia Elton Mayo has stressed, young people wish to assume responsibility, to be taken seriously, in a society which often offers them none, except in wartime. A gang rumble or a burglary do in some degree serve such needs.

However, it is not only a question of proving one's manhood but of getting on with one's life and deriving satisfaction from it. Lack of work naturally means one is making no progress towards skill, independence etc., but even when work is available, if it is boring and undemanding, the feeling that life is not providing the experiences and development it should is bound to be felt. Governments seem astonishingly blind to

the frustration this can cause, and view work purely in terms of income and output.

7. CULTURALLY-APPROVED VIOLENCE: As Wolfgang and Ferracuti [8] have stressed some societies approve violence and provide institutional forms which limit its expression, e.g. the duel and the mock-battle. (Competitive sport is in this tradition.) Gang-rumbles comprise such an institutionalised outlet, into which the youth will direct his energies, in the absence of approved and conveniently available alternatives. Important as this may be as a guide to remedies in the short run, I cannot regard it as a prime cause. Temperamentally unaggressive people would simply let the practice die (as happened to the duel) and temperamentally aggressive ones would devise new institutions and convert a peaceful culture into an aggressive one.

Given seven distinct types of violence it is obvious that many generalizations about violence, and its causes, are bound to be inadequate.

IV. THREE ACCESSORY FACTORS

Three accessory factors should be briefly mentioned, since they are often cited as prime causes.

a. Justification of Violence: The urge to commit violent acts is facilitated if society, or some group in it, condones such acts. To-day we observe intellectuals writing philosophies of violence (e.g. Fanon) which enable such persons to assuage any lingering pangs of conscience. The role of the media in presenting acts of violence assists this by

creating the impression that everybody is doing the same thing.

Oddly enough, violence even finds apologists among Christian theologians, as Ellul complains.[10]

b. Triggers: Psychologists have shown, in a long sequence of research studies, that if a person sees a violent act being committed, or even if he sees objects associated with such acts, e.g. guns, the probability of his displaying violence (given a suitable situation) shortly after is increased. However it is obvious that many people who see acts of violence do not respond to such cues, and I think it is clear that such stimuli act as triggers facilitating violence in persons already prone to violence, not as initiators of it. Hence the much debated question of the effect of television and the cinema can be answered in this sense. The real problem is what creates violence-prone people.

It is also argued that witnessing violence provides a 'catharsis' (a misuse of the word, incidentally) or discharges aggression, making vident behaviour less likely. This argument is grounded in the belief that aggression is a form of energy which builds up in the psyche and demands an outlet---the so-called 'hydraulic theory' of aggression, for which there is no evidence.

c. Learned Aggression: American psychologists of the learning-theory school like to regard violence as a learned response, and it is true that animals can be induced to be aggressive by reward and punishment; or can be taught to be unaggressive. However, in the seven types of violence just enumerated, violence does not invariably pay, except in the sense that it often provides a psychological reward. In a material sense it is

often more paying to avoid violence, which evokes a much more drastic response from the law. Thus we are brought back to the question why people get a psychological advantage from violence, and remedies must be aimed at this quirk of personality.

Attempts to provide human environments in which aggression or other anti-social behaviour is reduced by rewards have been made by B.F. Skinner and his followers. (9) This may be a good opening gambit to gain the co-operation of the unwilling, but since such rewards cannot be continued outside the institution, it is necessary to awaken positive internal responses---increased self respect, reduced anxiety, easier comradeship---if the improvement of behaviour is to persist when the subject returns to normal life.

V. PSYCHIATRIC & PHYSIOLOGICAL

The psychiatrically orientated will perceive that the above patterns are related to the three structures postulated by Freud as forming the psyche---the super-ego, the ego and the id---together with the warping of emotional response. They will know that super-ego is formed by the introjection of admired parental models, particularly the father, and for this to occur the father must be present, must be accepted, must himself exemplify a code of behaviour. Weak, including alcoholic fathers, and fathers who are denigrated by the mother, lead to super-ego defect in children. Since rejecting fathers are unlikely to be introjected or used as a model, failure of super-ego formation tends to go along with emotional warping; thus both the motive to cruelty and

the restraining force is removed by the same process and the two factors are difficult to separate in practice. Super-ego defect is widespread to-day, and external controls (such as police supervision) are under greater pressure than they can bear.

But while the Freudian background is generally understood, few people know much about the physiological substate, which recent research is revealing to be of considerable importance.

Physiology: It is well established that individuals vary in aggressiveness for biochemical reasons, apart from any learning experience or situational frustration they undergo. Thus males are constitutionally more aggressive than females, but can be made less aggressive by castration. (True of mice and men.) Conversely, females (in the case of mice) treated with androgens at birth or soon after can be made permanently more aggressive. (I defer considering the relation of aggression to violence.)

It is established that persons of mesomorphic body build are more inclined to express their feelings in bodily activity and hence to become involved in appropriate types of criminal violence. (11)

Certain personality types exhibit 'stimulus hunger'. Relative insensitivity to stimuli (they are tolerant of high noise levels, among other things) means that only intense experiences get through to them: they take risks or become involved in emotional or competitive conflicts which exhaust introverts. The 'boredom' given by some delinquents as a reason for their actions probably expresses this need for powerful stimuli before anything is felt.

Violent rages ~~(beserk, amok, Arctic madness, etc.)~~ doubtless result from an unbalancing of the aggression-mechanism/restraining-mechanism ---as can also happen when brain tumours form in the hypothalamic area, or when it is lesioned experimentally. In others, the system may be permanently slightly out of balance, causing very aggressive, or, contrariwise, very timorous behaviour. The possibility of an anti-aggression pill depends on the existence of this mechanism. No statistics are available to show the numbers of such people, either temporarily or permanently out of balance. How far external factors can cause such imbalance is unknown.

VI. SOCIAL ORIGINS OF VIOLENCE

Most of the kinds of violence considered above spring from causes which can be shown to be favoured by strong trends in technological society. Here are some:

1. Commuting to work: Psychologists are agreed that super-ego formation depends on the father being present when the child is 1½-2½ years old. As Biller (12) has shown, modern work patterns, commuting, etc. often cause fathers to be absent during the whole of the child's waking day at this age.

2. Anonymity; mass society: The anonymity of mass society and especially of urban living has been the subject of many books. Urbanisation continues and the greater part of the world's population will be living in cities

by the end of the century. The growth in city size means longer commuting distances.

3. Improved communications: People are shown the pleasures the world has to offer on an unprecedented scale, by all the media, but especially television. The conditions, both economic and human, which have to be met to provide and enjoy such pleasures are much harder to explain. Advertising implies that everyone has a 'right' to such pleasures, from water-skiing to fine brandy.

4. Unloving parents: Unloving parents are usually themselves the children of unloving parents: a social transmission of emotional crippling occurs. While it would be impossible to show that the situation is worsening, there is equally no sign of such chains being broken. Probably the nuclear family compares unfavourably with the extended family in this respect: a child might receive love from other members of the household---as is known to happen in the Marquesas, where each child has several mothers. (The biological link is obscured; the mother and her sisters are all regarded as mothers.) (13)

In addition to all this, easier divorce, alcoholism and other factors seem to be increasing the number of 'broken homes'.

The above four factors, at least, show no sign of reversing in the immediate future; they are more likely to intensify. Thus we are bound to conclude that INDIVIDUALS PRONE TO VIOLENCE WILL BECOME MORE NUMEROUS, quite apart from questions of population growth. And population size

is not negligible. If it takes n desperate men to destroy the whole of society (to take the limiting case) a doubled population is twice as likely to produce that number of desperadoes.

Three other factors, which may or may not be intensifying, are too important to omit from consideration:

5. Education: In the narrow sense of the word, education is still concerned primarily with teaching facts and methods; it is hardly at all concerned with teaching people how to achieve satisfaction in life. (14) Those in authority have only the dimmest conception of the frustrations and pressures considered above and rate them much less important than the GNP and the balance of trade. In the wider sense of the word, society continues to stress material values and makes the acquisition of goods the main source of satisfaction.

6. Genuine Injustices: A considerable proportion of the world's violence arises in attempts (realistic or otherwise) to remedy perceived injustices. The violence occurs partly perhaps because of a taste for violence, but also because the system fails to adapt. In these words I cover a wide range of 'political problems' of which the reactionary regimes in some S. American countries can serve as a convenient example: to say nothing of racial issues. Obviously there are no easy solutions, and violence is inevitable here.

VII. CONCLUSION: CONTROL OR CURE ?

There are two ways to stop steam coming out of a kettle: plug up the spout or take it off the fire. The probability is that the world will continue to attempt to control the pressures of violence by more violence, a process which is self-perpetuating.

It is still widely held that severer legal penalties, including birching and the death penalty, are the main sanction against violence. Of course, it has been shown repeatedly that (a) most offenders are not caught, and only a proportion of those caught are convicted and sentenced; thus for the majority violence and other forms of anti-social behaviour are a good gamble; (b) that most of those who commit such acts are incapable of thinking ahead to consequences; (c) that a prison or reform school sentence introduces the neophyte to hardened criminals and confirms him in his ways. In addition, the political terrorist is often prepared for death and may even welcome it as a gesture. (The men who shot up Lydda airport declared they would reappear as stars in the sky, along with their victims.)

As psychological experiment shows, punishment must follow the action immediately for conditioning to occur. If the child who touched the fire only felt pain months later, he might never learn to leave it alone. But the legal system inevitably separates crime and punishment.

While many of the public rely on punishment, the public authorities tend to aim at prevention: preventive arrest based on a good intelligence

service is the core. Censorship, imprisonment without fair trial, certification as insane, and banishment to labour camps, together with the use of agent provocateurs not merely to get information but to justify manslaughter, have been the pattern from the days of Fouché, andearlier.

It is a pattern now being imitated in some third world countries; the most probable forecast for the next thirty years is that we shall see an increasingly sophisticated use of such methods as Orwell forecast. The use of torture of a refined kind to extract information, including its use on children, seems a logical development. In addition, there will be a greater use of searches for concealed weapons and explosives (the searching of aircraft passengers is an indicator) and an erosion of privacy (cf. the privacy of bank accounts.)

Perhaps I may add to what I think will happen, some thoughts about what <u>should</u> happen. First, we should make a massive attempt to detect physiologically unstable people before they commit acts of violence and give them such therapy as is available. Second, we should make a massive attempt to identify psychologically unstable people before they commit acts of violence and give them such support and therapy as we can. Thirdly, we should make an even more massive attempt to prevent the formation of disturbed personalities, by an extension and improvement of social and psychiatric work at the level of the family. Lastly, even more ambitious, we should try to change those aspects of our society which (as I briefly indicated) create these problems. As this would

include (for example) restraining U.S. companies from intervening to support S. American regimes, it is obvious we are now talking about the solving of all political, economic and social problems ! Moreover, there would obviously be bitter opposition to Points 1, 2 and 3, which raise key questions about individual rights. In short, I conclude that no radical attack on the problem will be made.

It remains to be seen whether, in these circumstances, technological society can continue to function.

REFERENCES

1. Dollard, J et al. Frustration and Aggression, 1944

2. Scott, J.P. Aggression. University of Chicago Press, Chicago 1958.

3. Schoeck, H. Envy: a theory of social behaviour. Secker & Warburg, London 1969.

4. Allchin, W.H. Young People. Guild of Pastoral Psychology, London 19

5. Toch, H. Violent Men. Aldine Press, Chicago, 1969.

6. Parker, T. The Frying Pan. Hutchinson 1970.

7. Mayo, P.E. The Making of a Criminal. Weidenfeld & Nicolson, London 1969

8. Wolfgang, M.E. & Ferracuti, F. The Subculture of Violence. Tavistoc Pubns, London 1969

9. Skinner, B.F. (television programme, BBC, Horizon)

10. Ellul, J. Violence. S.C.M. Press, London 1972

11. Cortes, J.B. & Gatti, F.M. Delinquency and Crime. Seminar Press, New York & London 1972.

12. Biller, H.B. Father, child and sex role. D.C. Heath, Lexington, Mas 1971

13. Kardiner, A. The Psychological Frontiers of Society. Columbia Univ. Press, New York, 1945.

14. Shane, H.G. Prospects and Prerequisites.

STYLES OF LIFE

By Victor Scardigli
Sociologist

This paper attempts to draw a picture of what might be the ways of life in our country in 1985.

1. An analysis of the possibilities of permanence and of change in general society has led us to identify four "moving forces" of evolution of our country and of our ways of life:

   - the opening of frontiers;
   - the affirmation of the aspiration to happiness and individuality;
   - the accentuation of the concern for equality and social justice;

2. These lines of force would lead to a way of life capable of reconciling, at least until the date mentioned, the diversification and the expansion of "non-productive" activities and the maintenance of the effort of production, necessary for the advancement of social policies as well as for the growth and the change in orientation of consumption.
   The realisation of these conditions would bring about an acceleration in the change of our way of life.

   As regards spending, the need to "have" (in terms of food, clothing, etc.) more or less saturated or satisfied, would give way to the concern with "being" (goods and above all services aiming at the realisation of human personality and the improvement of the standard of living).

   As regards the life cycle, the development of permanent education would compensate for the diminished attraction of higher education.

3. Unless it is prepared as from today, this change in the "quality of growth and ways of life could pose serious problems of adjustment to tomorrow's world.

A certain structural rigidity will undoubtedly become manifest at the level of the production apparatus, caught between the pressure of the workers (for modifications in working times and conditions) and those of the consumer public (reconversion towards certain services and goods).

As regards the distribution apparatus, the risk is that the relevant decrease in the number of artisans and shop-keepers might coincide with the moment in which buyers turn increasingly towards specialised forms of trade and personalized services.

As regards the city, it seems even more doubtful that the offer in housing will be able to satisfy the rapidly growing demands in terms of comfort and living space; the break maintained, if not accentuated - between town and country will prevent us from achieving a "decentralisation" of the great urban conglomerates.

As regards education one can already observe a difficulty in setting up institutions and in producing teachers capable of answering to the considerable demands of permanent education.

More in general, all these transformations presuppose an increased financial effort such as to imply relevant changes in the field of taxation and in the mechanism of resources redistribution.

I - TOWARDS A NEW CONCEPT OF GROWTH: LINES OF FORCE OF A SCENARIO OF OVERALL SOCIETY

According to the hypotheses mentioned earlier (see Part I) four driving forces could direct our country and therefore our ways of life towards that "image of the future" which we shall now illustrate.

1. The opening of frontiers

- The Nine (perhaps joined by other Northern and Mediterranean countries) will have developed towards an economic Confederation of States, which will have accomplished customs unification but probably not yet monetary unification. Political decisions will continue to be made in a national context, although this does not exclude the possibility of reciprocal influence.

  A rapid trend towards the Europeanisation of the French market: importation of numerous innovations.

  Europeanisation of capital and of certain sectors of economic activity. As a reaction, the institution of super-national agreements between trade unions. The influence of the American, German and Scandinavian models on the running of industrial concerns and on industrial relations.

  Harmonization of working conditions, but still a very low international mobility of workers, due to the persistence of language difficulties. Massive influx into our country of

foreign tourists and pensioners, notably "North Europeans". A certain unification in taxation, legislation and social institutions, which will, however, continue on the whole to be very "national".

- France and Europe will have opted for an opening to the Third World - although developing selective protectionist measures at the same time - in order to avoid an excessively rapid break-up of the agricultural world and to decrease our dependence in the field of energy supply. The development of aid missions to Asian and above all to African countries: the need to implement a policy for the immigration and integration of workers from the Third World.
  Public money will be oriented by priority towards the renovation of infrastructures (communications; housing) and towards their creation. Increase in external aid. An important part of the resources of the Nine will be aimed at reducing regional disparities.

- Increase in exchanges with the other developed countries. As a result of this, development of particular "grey-matter" services and industries.

2. <u>The affirmation of the aspiration to happiness and individuality</u>

The break-up of the traditional system of values, based on work and social conformity; the emergence of a new system of ethics in which the key-words are happiness, enjoyment, self-realisation

and the autonomy of the individual. Scarce success of "voluntary marginalisation" solutions among the rising generations.
This change in the system of values will lead to:

- a readjustement of roles within the family; a diversification in life cycles, as well as a greater family, vocational and geographic mobility;
- A lowering in education figures at university level, compensated by a very rapid development of permanent education;
- A development of active and passive pastimes (the former implying some type of original creation, the latter consisting simply in the "consumption" of cultural products and services and of pastimes), to the detriment of activities answering to an economic obligation.

3. Increased concern for equality and social justice

Under the pressure of public opinion, policies will have been implemented for the ~~affermation~~ attenuation of inequalities and a trend towards a "social planning" alongside economic planning will be under way. These measures will take the form of a policy of income redistribution, in particular under a monetary form.
This greater equalisation in resources and riches will have brought about a greater uniformity in life and consumption patterns. The diminution of the less qualified and less paid

jobs, the increase of old-age pensions will have led, after a period of conflict among various categories, to improved relations among groups of different age, sex, vocational status and to changes in the relations between these social groups. As in the world of labour, where the contract-system is spreading all social groups will have developed processes of dialogue and negotiation, following on a series of crises which will have prepared them to accept compromise solutions.

4. Maintenance of a solid economic growth-rate

The rate of economic growth will nevertheless be comparable to that of the last fifteen years. This for various reasons:

- In spite of their new aspirations, families will continue to wish to increase their income, in order to satisfy "needs" of all kinds (those suggested by technical innovation as well as those provoked by new values).
- Public opinion, made sensitive to the growing cost of social policies, will have exercised pressures in favour of a regulation of conflict and a policy of expansion.
- Companies, although adapting jobs and working conditions to the new social demands of the workers, will benefit from an important technological contribution consequent to the Europeanisation of business and "the inflation of innovation".

Nevertheless, from about 1985-90, incompatibilities between the aims of industrialisation and new values might explode, bringing about a fairly long-lasting decline in the rate of economic growth.

II - A PICTURE OF A WAY OF LIFE IN 1985

These geo-political, economic and social changes will combine with the dynamics ~~particular to~~ involved with each particular way of life (see Part II), producing an acceleration in the changes in the life of the French tomorrow.

1. France tomorrow

- The major fact will undoubtedly be the doubling of the gross national income, obtained by maintaining the growth effort for a prolonged period. In terms of purchasing power, the French will be almost two times richer than they are now, and a little richer than the Americans of today.
- The Frenchman will find himself in a considerably extended urban network, 83% of the French will be living in towns and urban districts and, what is even more significant, one Frenchman out of two will live in towns with more than 100.000 inhabitants. Paris alone will embrace a fifth of the total French population.

- There will no doubt be an accentuation of the differences between areas with a high economic activity-rate (North-Eastern half of France) and the areas preferred for leisure and retirement.

- At the same time, there will also be an increased contrast between town and country.
  Population density in the rural areas will have dropped considerably (two peasants out of three will have disappeared 13 years hence). The country will be populated by elderly people; a considerable number of old-age pensioners (North Europeans, etc...), communes and other voluntary dropouts. However, the role of the country as a place for leisure and retirement will have been enhanced: its rhythm will be that of the week-end migrations of a considerable portion of the population.
  Town inhabitants, during their 4-and-a-half to 5 days of urban life, will continue to have very full working and daily travel hours and will be in a hurry to get back to their homes; the latter will be very comfortable, considerably more spacious than they are today and served by quite a number of robots and other gadgets; television screens (or their successors) will absorb the greater part of people's leisure time.

  The Frenchman will increasingly have two poles of interest: the out-of-town space (for the pleasure of contact with nature) and the home space (for the pleasure of information, reading, relaxation, play, etc.). Between the two, the urban space will only be used for the purposes of production, less and less as

for recreation; the inhabitants will simply transverse it hastily to go to work or to shop. The centre of the city, although perhaps more modern, might have deteriorated, because of the slow encroachment on the surrounding green areas, the migration of a part of its inhabitants towards the outskirts and, finally, the disappearance of small business, replaced by great supermarkets on the outskirts.

2. The world of labour

Developments in the world of labour will bring about profound changes in social structures and mentalities.

- We shall be a "wage-earning society"; 85% of the workers (as opposed to 77% today) will be salaried; hence a modification in their attitudes toward work, risk and saving.
- Whereas the French population today still largely consists of workers and peasants (accounting for approximately 50% of the population), in 1985 it will begin to be a country of "white-collar workers".

Employees and people with political, technical or business responsibilities (48%) will become more numerous than the working class (38%); in particular, the proportion of those in responsible positions will almost double (8% as opposed to the present 4,9%).
These developments will be accompanied by sensitive changes in job relations.

- Companies will have been forced into important but not directly productive money investments, to counteract the hostile reactions of public opinion to the negative effects of growth (pollution), as well as to improve labour conditions and interest in work: automatisation, gradual abolition of the assembly line, greater safety, etc. Decrease in the number of non-qualified jobs; however, a small number of jobs will continue to be depreciated and therefore tend to be occupied by workers from the Third World.

- A certain number of Companies will in fact have reached the point of proposing a more and more varied range of working rythms (from very reduced part-time to super-charged timetables), with the risk of finding themselves in conflict with present regulations, the trade-unions and the State.

- An increasing number of women will be working, both to acquire a greater independence and for self-realisation.

  This increase in the number of working women will compensate, to a certain extent, for the decrease in the average male activity-rate (due to an increase in the number of people working part-time or involved in recycling).

3. <u>The organization of the life-cycle</u>

   a. The life-cycle will be marked by a growing interpenetration of involvement in education, in production, in family life and retirement.

- Pre-school education will begin very early (from the age of 2). In an increasing number of families, the young will reach independence earlier and earlier. 1985 will probably witness a check in the trend towards a progressively longer school education, with the young preferring to recycle further on, thanks to a network of permanent education institutions far wider than it is today.
  A growing minority of workers will seek for temporary jobs, or part-time jobs, or otherwise periodically interrupt their work for long periods of travel or study.
  This new mobility (vocational, for study or for pleasure) will be brought about both by the change in the system of values, by the opening of frontiers and by the very rapid changes in the employment market.
  Finally, the transition into retirement will often be more progressive thanks to a staged decrease in working hours, enabling one to work part-time beyong the "normal" age.

- Retirement will take place at an increasingly early age but one will also be able to take advantage of it more and more since the French will enjoy the prospect of living three-quarters of a century (average life-expectation: 74 years, as opposed to 71 today).
  These old people will engage in far ~~many~~ more different activities than they do today, thanks to the improvement of their state of health and the increase of their resources:

concerning taxation and social security benefits, the other social groups will show their solidarity with the elderly by allocating far greater sums of money for their benefit.

b. The working year will continue to be interrupted by the 3-to-4-week holiday, generally taken in the months of July and August (in spite of the high cost of this French habit) and marked by the generalized spread of shorter paid holidays, week-ends and holidays of one to two weeks, spread out during the year (~~with~~ averaging 5 1/2 to 6 weeks of holidays a year).

c. On the other hand, the daily time-table will not change much. The individual will certainly work a little less (41 hours a week); but his time off from work will be concentrated around the week-end, and his holiday of at least 48 hours every 8 days or so -- will become a general practice.
He will spend the greater part of his free time in the house. He will spend much less time shopping and preparing meals, a little more in acquiring information and education (newspapers, permanent education); still more than at present in watching television and other audio-visual apparatuses.

4. <u>Development of a new life-style combining leisure and social relations</u>

Certainly, we shall still be far from a "leisure civilisation" and work will still be at the centre of our lives.

However, if the working hypotheses held come true, it is clear that the last twenty years of our century will witness an exceptional development of activities aiming at the fulfilment of human personality. These activities will go in a continuous line from permanent education (to preserve and increase knowledge acquired previously); to prepare for a change of job; but also to learn new leisure activities, to prepare for the activities of the "third age", etc.) to leisure activities practiced individually or in small groups: sports, audio-visual activities (individual screens or small local viewing halls), other recreative and creative activities of widely different types and often implying the development of means of communication.

- As regards holidays, it is plausible that after the present infatuation with collective forms of transport, living and entertainment, the public may go back to individual more costly solutions or at least to solutions ensuring a maximum of independence and privacy.

- As regards housing, the demand in terms of surface and of comfort will no doubt increase greatly, with each individual practicing more and more leisure and communication (as well as permanent education) activities in his own home.

5. Diversification in family expenditure

a. Family budgets will be characterised principally by a diversification in expenditure: families will gradually come to give almost the same importance to food, health and beauty,

pleasure and transport and their own homes.
However, this will involve a radical change in the structure of spending.

The first part of the table which follows presentsa very approximate assessment of what this budgetary structure might look like. It reveals three important trends:

- Rapid decrease in certain traditional items of expenditure: clothing and food for the home. These two items, which in 1950 absorbed almost 2/3 of the total budget, will probably only represent 1/5.
- Rapid increase in expenditure for personal welfare: education and pleasure. Even if the community continues to contribute to these items, this growth will appear directly at the level of current expenses (separated under the item "various") and indirectly in various other items: lodging and transport (increasingly destined to these activities), eating out (on holiday) and beauty.
- An increase less relevant than in the past of health expenditure These possible developments will therefore take the form of an <u>acceleration in the changes</u> which are taking place in most fields.

b. For certain items, the different forms of collective financing (grants, free assistance, refunds, etc...) will play an even more important role than they do at present.

The second part of the table illustrates the developments which can be forseen in this field. It is quite possible that State-coverage of the costs of education and health might surpass or reach 90 to 95% in a future even closer than 1985, stabilising around the levels indicated.

c. Preoccupations with security and the financial behaviour of individuals will be strongly influenced by the accent placed on the absence of any "career plan" or life plan, the lesser coherence of the life cycle, or the primacy given to non-material investments (education, leasure ...).
This will result in a lesser preoccupation ~~about~~ with the future and therefore in an at least relative decline in long-term plans for the future and free saving; the development of contractual saving (housing, credit buying). The acquisition of property will be considered by families as an "expense for the enjoyment of life" rather than as a "security-investment".
The task of forseeing risks will be devolved onto the community: this will lead to a considerable development of insurance systems in matters of health, old-age pensions, unemployment and other forms of social security and, consequently, to a considerable growth in the monetary mass drained by the community. In other words, increased community contributions to certain expenses will find a counterpart in higher taxation on primary revenues.

III - WILL WE BE ABLE TO FACE THESE CHANGES?

The (relative) decrease in traditional forms of consumption, the generalisation of recourse to the services - which will account for more than 50% of the family budget, as opposed to only 25% in 1950 - presuppose the fact that the structures of the French economy will have had the time to adapt to these changes, more rapid than those announced by normal economic forecasts.

They also imply the need for a very considerable vocational mobility among workers, who will be called upon to turn in mass from industry to the services - therefore a very rapid growth and spread of permanent education, ~~in~~ parallel to measures aimed at the protection of the workers most exposed to the risk of unemployment.

Will France be able to face up to these changes? Unless it begins to prepare for them as ~~from~~ of now, it is likely that within the next ten to fifteen years it will come up against considerable difficulties.

- The economic structures of our country remain antiquated and the reconversion of the rural world has not fully taken place. The resistence to change which characterizes our structures might act as an obstacle to our transformation into a "society of services".

- At the same time it is to be feared that certain structural rigidities will become evident in various sectors, jeopardising the chances to improve working conditions and the very concept of

jobs and roles within industry. We should then see a spreading phenomenon of over-qualification, causing no little in frustration among the young, and compromising the possibility of reconciling interest in work with the new "hedonistic" aspirations.

- The people will find themselves caught in a psychological conflict between their interests as consumers (desiring this change in their way of life) and their interests as workers (who fear the dangers of vocational mobility and who at present hardly make any use at all of adult training opportunities).

- The cost of reconverting the apparatus of production and labour will be considerable, as will be the cost of protecting the workers most exposed to the risks related to this reconversion.

- In many cases, there is the danger that the means to effect these changes are insufficient. Establishing a real permanent educational system poses the greatest problems since, at present, the structures and the people are almost totally missing.
- Also, the distribution apparatus threatens to become less and less adapted to the change in the public; the latter will seek for the quality guaranteed by the services of specialised trade, whereas the traditional shop-keepers will have vanished in the proliferation of the self-service system.

- One of the principal obstacles to change will be of an institutional nature. Made to ensure continuity in change, laws and regulations have a double effect and the regulations which (very effectively) protect workers and consumers can be equally effective in slowing down the adaptability of companies, the mobility of workers, the modernization of towns, etc.
- The still marked ~~severance~~ disparity between the urban working space and the non-urban leisure space will clash with a decided aspiration towards an attenuation of the distinction between work and pleasure.
- The lessening of inequalities will undoubtedly benefit immigrant workers very little - hence the possibility of permanent conflicts according to the well-known patterns.
- Finally, it can be feared that the urban space will, only after an enourmous delay, manage to follow the development of the functions which the public requires it to fulfil. Will it be possible to free the necessary surfaces for the development of the family service activities? To adapt the transport networks to the very strong growth in the demand for individual and collective urban transport, to build a sufficient number of community services in the suburban areas to attract people wishing to live in houses or small blocks of flats? Will the old habitat be able to lend itself to a qualitative improvement and, above all, to an increase of the surface which every member of the family needs in order to exercise his or her very varied activities?

In spite of the size of these obstacles, our scenario has been decidedly optimistic as regards the capacities for adaptation of French society. This first analysis of the developments which are taking place and those which are about to, has revealed that there are sufficiently great human and economic resources to lead us to believe that our country could meet this challenge and continue its growth, progressively turning its objectives towards social well-being.

At present, what remain to be defined are the margins of manoeuvre which are left to the "decision-takers" - State, enterprise or private citizen - enabling them to put a stop to these developments if they are unfavourable, to stimulate them if they are desirable, to prepare for them if they are ineluctable.

This type of assessment would find valuable support in the elaboration of other scenarios based on totally different guiding hypotheses, and on "background data" enriched by more detailed observations on French society and on certain other advanced industrial societies, notably the USA.

FUNCTIONS	1950		1969		A possible development around 1985	
I. BUDGETARY STRUCTURE OF PRIVATE EXPENDITURE (a)						
- LIVING CONTEXT						
. House and furniture	13,5	18,6	22,3	31,7	~27	40
. Transport	5,1		9,4		~13	
- FOOD						
+ at home (including tobacco)	48,5	54,8	29,0	39,7	~15	28,5
+ out (including hotels; pubs and restaurants)	6,3		10,7		~13,3	
- CLOTHING	15,2	22,5	9,6	23,0	~ 6	23,5
- HEALTH	4,7		9,4		~12,5	
- ADORNMENT, beauty, hygene	2,6		4,0		~ 5	
- VARIOUS (including current expenses for education and leasure)	4,2		5,8		~8	
TOTAL	100		100		100	
II. PERCENTAGE OF COMMUNITY FINANCING IN THE TOTAL OF PRIVATE AND PUBLIC EXPENDITURE (b) CONCERNING FAMILY CONSUMPTION	1950		1969		Around 1985	
- LIVING CONTEXT						
. Housing	3,2		5,9		4 to 5 (c)	
. Transport	14,7		14,5.		~ 15	
- FOOD	4,0		6,7		8 to 10(c	
- CLOTHING	1,6		1,4		~1 to 2	
- HEALTH	70,4		86,2		~ 90	
- EDUCATION	76,7		89,5		90 to 95	
- CULTURE, SPORTS, ENTERTAINMENT	6,9		9,6		~ 15	

a) Expressed as the percentage of the total family budget Source: see Rapport intérimaire.

b) Source: CREDOC Report n° 4086/1972 "Consommation des ménages et consommation publique divisible 1959-1969" Table 10. The calculations for 1985 are ours.

c) Essentially, grants to producing companies.

Some Example of Applied Creativity

By Arne Sørensen
Social Anthropologist
President, the Danish Society
for Research on Futures

In spite of all other differences there has for a long time been complete agreement between the Capitalist and the Socialist countries as to the benevolent consequences of economic and technological growth. The next challenge is now upon us. On the basis of good mass-production, taking care of our primary needs for survival, how do we create new cultures in which all citizens may participate actively? History shows us a great number of wonderful cultural achievements, created for the few. But man has never before faced the challenge of making a beautiful and deeply satisfying culture, made for and by everybody. What lies beyond material satisfaction, beyond good administration in a rational way? How, in a culture for and by everybody, do we equal the Acropolis, the works of Shakespeare or Michel Angelo - and don't forget: not by imitating them. No, by creating something never seen or heard or smelt before?

For some years, we have been straining our capacities for creativity in rather impossible ways. We have tried, very unsuccessfully, to make creativity a goal an sich. In schools for children our teachers have been striving courageously for this goal per se. But in this way our impressive mountains are constantly giving birth to mice. The purpose of singing cannot be singing; the aim of painting not painting. Wet clay as a purpose in itself just stays what it embarassingly is: wet clay.

Apparently the rules of creativity run somewhat like this: creativity is possible only as a by-product of working for a goal outside ourselves.

1.The Country of Denmark as a Work of Art

In our Society for Research on Futures we have entered into a new kind of activities which are very promising.Not that we are not experiencing failures.Not that some of it may not look quite silly.Not that some of it will not become terribly vulgarized.But we are doing the right things.We are taking pride in having found very promising approaches.

What we want to do is simply to create a new country,a new culture,a new society.This we mean quite literally.We want to create new forests,new hills for skiing (this is how to get rid of "mountains of plastic bags").We want to see new landscapes as pieces of art.We want to see towns and villages and cities as new pieces of art.We want all of this to shine in the eyes of our children.

And we know that all of this will not shine,unless it is done for justice,for freedom,for equality.And as a surplus of all of this we are quite ready to write poems about what we are doing.

2.The theoretical beginnings

Locally

Quite scientifically,but still with some unfinished poetry swimming around under the ceiling of the room,we began by formulating a project: In the next hundred years, how do the Danes want to use their land-,sea- and air space? This meant that we had to go through a lot of statistics,a lot of demographic studies,a lot of ecological problems.

What we found was rather disturbing:In a small country of 42,930 km^2 (not counting Greenland which offers almost nothing but size) we are about five million people.In a few decades about half of this entire population may be living in Copenhagen while the life of all villages and small towns will be withering,because the inhabitants of the capital want the other parts of the country as recreational areas.Already square miles and square miles of thatched roofs appear again.

3.Joined by another movement

We began our theoretical work four years ago.But two years ago something else sprang up.Scores of spontaneous provincial and local movements appeared.Sometimes the city and town councils officially.In other cases informal groups.Conservatives,Liberals,Social Democrats.And a few from the Student Revolt are beginning,especially those who - as the late Paul Goodman taught them

- are good anarchists.
Consequently the Society got into cooperation with a growing number of municipalities.Following the Roman numbers on the map,next page,we shall describe some of the projects which came about in this way - or are about to come about.

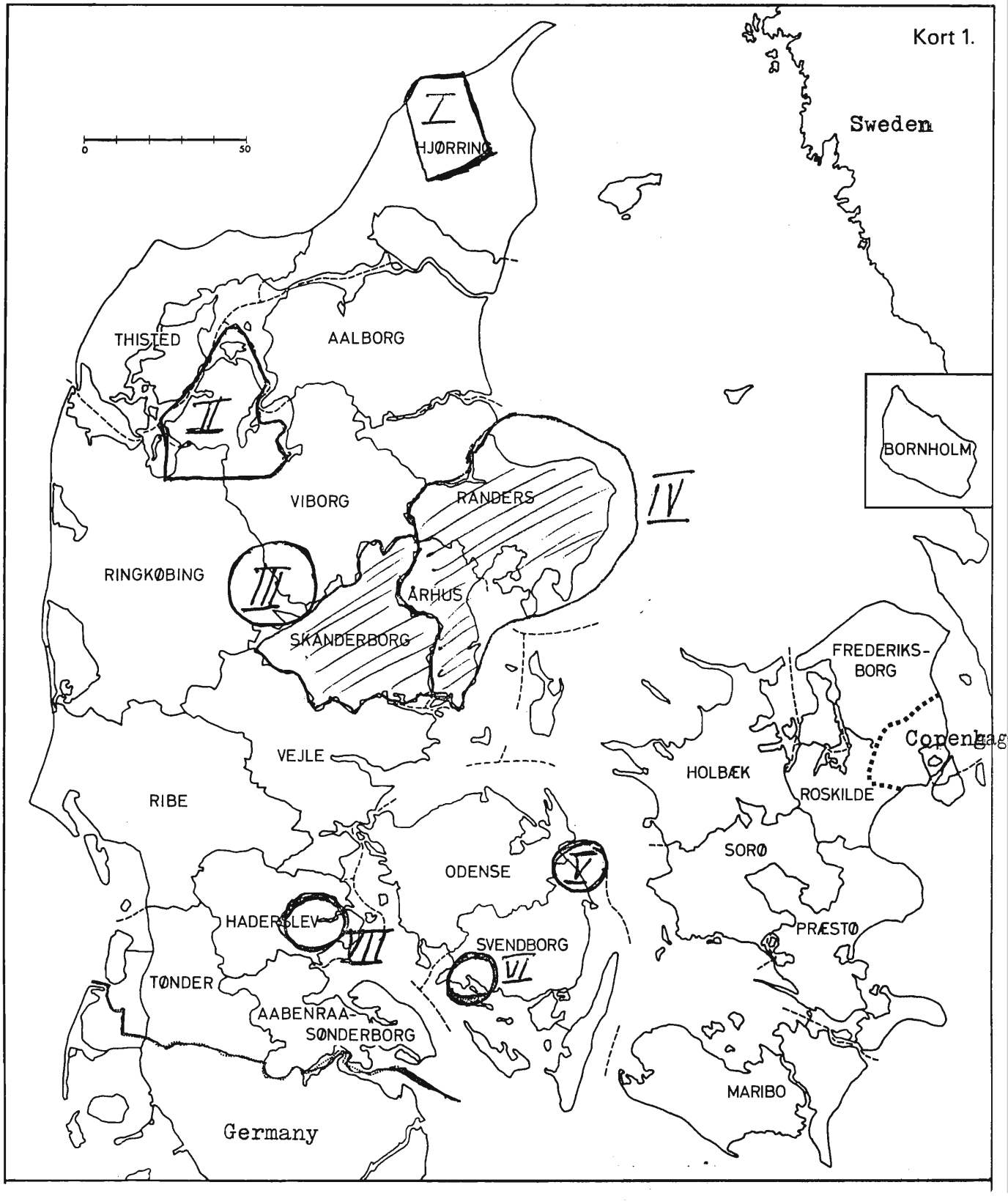
I.The towns of Hjorring (33,000 inhabitants) and Hirtshals,on the coast (15,000) want to develop a twin-city.A "rural-urban" area between them.More production,more art,on better ecological terms.We are getting involved in this by making a number of social innovations.

II.Five municipalities under contract with the Society.One of about 30,000,and four others,another 30,000 people.A beaufiful peninsula and an even more beautiful island.Can you imagine having all of that thrown at you as a canvas to paint on? To make it sing? To pick up words of poetry in the hills and along the shores,along with crabs and shells?

What do these people want? The want to counter-act the "natural tendency" of everybody moving into the larger municipality,and the rest of the area to become dead hills among which weekend people and foreign tourist wander about,entirely lost.They want to cooperate in making the entire area bustle with life,but in a "rural-urban" way.As one of them,an old farmer,member of the County Council,put it:We want a strong development here,but mild!

Here we must apply Policy Sciences and Systems Analysis.We must show the necessary interplay between new production,new homes,new traffic lines,new paintings and statues and parks,new educational facilities and new possibilities of tourism. As to tourism we apply an old rule which we have picked up from Paris and Florence and Venice:Do not establish any attractions for tourists exclusively.Create only what the natives will be happy about.Exactly those things will be loved by the tourists,more than anything else).

III.Herning,center of Jutland.They wanted a new comprehensive design for an educational center which I worked out under contract with them in 1969-72.They then started by purchasing a large textile plant which also was an art museum and are placing two schools in that.In addition they are building one more museum nearby,for all the paintings by Carl Henning Pedersen,a world-famous Danish artist.



Map of Denmark with projects of the Society for Futures Research

IV. A Museum of Futures for the County of Aarhus

This we are presenting as follows (with the purpose of depicting this large county which to most of its citizens is a complete abstraction):

The years 1850 - 2050:

a	b	c,1 c,2	d	e

a) A few examples from the distant past

b) 1850-1970. The completed industrial past, seen in its social, cultural, economic, technological aspects. This part will be revised from time to time, when strong tendencies from the future throw light back on the past.

c,1) The immediate past, representing already irrevocable decisions by the County. These decisions will be exposed to criticism by the visitor.

c,2) Decisions by the County which can still be changed. Visitors' criticism and new ideas.

d) Alternative futures for the period 1985-2050. Filled out only tentatively by the museum administration. Again criticism and new ideas by the visitors, to be set up in models, and revised from time to time.

e) A few examples of very distant futures, promising or threatening.

By visitors we mean individual Danes and foreigners as well as classes of students, children as well as young people.

If possible, a computer should be placed near c,1 and c,2 in order that the officials of the County as well as study groups can use it for alternative simulated futures.

When this museum plan became known to Americans during the Third World Futures Conference at Bucharest in 1972, Arne Sorensen was invited to present it at the Annual Meeting of the Museums of the Midwest in Minneapolis this coming October, and some local museum

people hope that the State of Minnesota will develop such a museum. A similar invitation from Hawaii has also been received.

Finally, we have made a very promising contact with another person, working on museums of ~~futures~~ futures: the German engineer, artist and computer-artist Antonoff, and we hope for cooperation.

V. Nyborg. Another municipality-contract, concerning alternative plans for setting up a museum in the 800 years old, and empty Nyborg Castle. Also a plan for another museum, showing early and especially premature inventions, all the way from Paleolithic times until the future. Another aspect of this plan is that it is suggested by us, that the models of inventions be made by people in Nyborg - retired people and working people in their free time, plus the inmates of a large prison at Nyborg.

VI. Faaborg Plans for a "Free Gymnasium", a school for the age 15-18, without final exams, and based upon the educational ideas of the great Danish poet and educator, Grundtvig (1783-1872).

VIII. Hadersley. A new college, corresponding to the Junior and Senior years of the four-year American College. Two years of study for Danes, and in addition, one year in English, exclusively on Futures Research. This international division is to be called College for the Future. On August 21st, this year the City Council of Hadersley unanimously adopted this plan, and the day before Arne Sorensen was appointed president of this college by the Danish Ministry of Education. (This is against our normal rules; usually we work out the projects and then turn them over to others. Here, somehow I got caught).

IX. Book on Public Art

This year Arne Sorensen received a Government Grant in order to write a book on New Public Art in Denmark since 1945. A great deal is happening in this field. The book will also discuss the new attitude of young artists now being conscious of understanding the common people and being understood by them.

X. A general agreement

between our Society and the Association of Danish municipalities as to exchange of plans and ideas, and work-meetings from time to time between the two secretariats.

4.Various evaluations of the projects:

a) Participation.No project of this kind will be successful - or in any way meaningful,unless it is developed in cooperation with the people of the various localities and regions.We are following this rule,not only because of being against paternalism,but even more so,because of being convinced that paternalistic solutions will be much more meager and poor. This does not mean that we are romantics in our views of the "common people",but rather that we find dialogues the best means of fruitful intellectual and creative activities.

Also,we generallly try to follow the rule that the formulation of normative goals as much as possible be left to the people concerned.

What a number of specialists from the Society can do is mainly to introduce ideas and problem solutions which could not be created by the local people.

5.Futures Research and Planning

Here we have developed a certain procedure which we find very useful.The sequence is as follows:

I.Collecting data.This will indicate certain limitations for our creativity.Financial,geographic,ideological in respect to a given region,etc.etc.

II.Futures Research during which we introduce a maximum of new ideas and problem solutions.It is important that the decision-makers study these proposals in great relaxation.They must not confuse them with planning.

III.The decision-makers will then select a minimum of the ideas which they find possible and desirable,and they wil also take care of the priorities of the ideas chosen.

IV.The stage of planning during which the selected ideas will be put into context of the locality or region.

V.Futures Research may be then be thrown in again,especially as to treatment of feedback.
Also,description of futures beyond the normal political time horisont may be helpful by linking short-term futures more strongly to future structures than normally in Politics.

6.Certain relations between basic and applied research

We are slowly discovering that certain discoveries in respect to basic research can be made only as by-products of applied research. This is probably parallel to certain discoveries made by phycisists and chemists as by-products of very large and complicated technological undertakings,such as for instance space rockets. In our case these discoveries take place mainly in the field of sociology and psychology.

When scientists,intellectuals and artists are in genuine cooperation with non-scientists,non-intellectuals and non-artists,the social make-up of both groups of people may change considerably. Not only for them as individuals,but also in the configuration of the working group.This is not too easy,but now and then one may glimpse solutions to the well-known and silly isolation of the intellectuals which has been - at least in the West - their occupational disease for so many generations.

Another aspect of this is the well-known,but often forgotten fact,that good sense of proportions mostly is to be found in the great geniuses and the common people,while the half- and quarter-intellectuals normally are weak,just because of lack of that sense.In other words,the kind of projects we have described here,will be good medicine against the plague of short-lived isms that have been the great nuisance of the 20th century - the problem of Protean Man as it so aptly has been named.

Still another aspect of this kind of dialogue between scientists and non-scientists consists of warnings for the scientists against vanity.He must develop a certain humility as to absolute ownership of ideas.In fact,he must be ready to evaporate graciously whenever somebody else wants to take over the ownership of ideas. If he is a really gifted person,this should be no problem.

Finally,the constant dialogues with local and regional non-scientists has led us to discover and formulate a certain number of theses in respeet to this kind of decentralization projects.The following:

Theses in support of decentralization:

a) Transportation and communication. In a small and densely populated country such as Denmark transportation of people, goods, and information can be made so fast and inexpensive that it is is almost irrelevant where in such a country one places new initiatives and developments. At least, when we improve transportation and make more new inventions thereof, the old concentration of people in few and large cities becomes a fallacy. (There are exceptions, of course: the interplay of very sophisticated artists, scientists and administrators require the large number of specialized people that are to be found in large cities only).

Following these possibilities, immanent in modern transportation and communication it will be a very pleasant and satisfying experience for the citizens of a country to have it filled to the brim by people and events. (We shall, of course, allow for a few Nature Parks in order that weekend visitors can eat their meals five meters from the highway).

b) Correction of false generalizations on the best size of units: In the past decades Denmark has experienced the same fusions as other industrialized countries: Fewer and larger banks, schools, industrial plants, administrative units etc. Everybody accepted blindly the belief that larger units always were better and more efficient than smaller ones. This is beginning to change. There are fights for the re-establishment of small schools. A large number of very modern plants can be quite small, especially in electronics and in the case of sub-contractors making instruments for, for instance, cars or aircraft. And as the modern anarchist, Paul Goodman, reminds us: we are in the thinking habits of the steam engine that required large industrial plants, and have not yet drawn sufficient conclusions from the electro-motor which can be placed everywhere, just attached to one or two machines. On the basis of such conclusions we advocate decentralization of industry. (With certain exceptions, of course. You cannot build an oil tanker in a village backyard).

c) Industrial pollution and the landscape. There is for the moment a strong tendency to place production in the "industrial-ghetto" of big cities and to protect the villages and the countryside

against the brutalities of "the machines". We believe this tendency to be largely wrong, and for several reasons:

I. It is now generally accepted that the big cities have passed beyond their optimal size, if they are to be pleasant to man.

II. If we are ever to heal the wounds in the landscape, made by the industrial revolution, it might be the best procedure to have small industries everywhere in order that their assimilation with nature be more manageable.

III. The most important point of all. If you deprive a small community of production and normal trade and make it a dormitory town or a tourist town or a museum town, then you kill the natural life of its people. Such a killed town may be all right for a poet or an industrial manager from the big city or a foreign tourist; it is death for the natives.

If we finally put all of these theses together and make them a big headline at the end of this paper instead of the beginning, we must set as our goal:

D E N M A R K : A G R E E N M E T R O P O L I S

Yes, I can guess your reactions, when you have read this paper: We do of course not solve global problems by going to small towns and villages. You may say that we have found the easiest way out by mobilizing face-to-face people. And if no other problems were solved, we would be back in the Stone Age.

Nevertheless, we want to say three things in our defense:

I. Perhaps we can train ourselves and other people so well in the problem-solving for small units that we learn to go on to the bigger ones with greater courage and understanding.

II. The best way of approaching the solution of the problems of the Nation State may be to enter them through the kitchen door.

III. Even the biggest cathedral consists of small bricks. We are to have sound bricks. So perhaps the best way of approaching global problems will be to see the entire human world as the sum total of manageable villages.

Seeing the world in this way, it may be a good thing that we are placing an international College for the Future in a small town.

INDICATORS FOR THE CONFRONTATION OF MATERIAL AND SOCIAL LIFE STYLE CONDITIONS

by Ota Sulc
Economist

Methodological comment

Theoretical research in life style issues is still in its development stage and for this reason we can only suggest a working definition of life style as a system of material and social conditions of activities, needs, motivations and mutual contacts of members belonging to a specific social group. It is the existence of particular development theories globally integrating this system which enables us to speak about partial development theories or conceptions, integrating pertinent life style components.

This is a precondition for suggesting a forecasting approach, based on the decomposition and subsequent synthesis of life style components and their indicators. This approach has been suggested as a five stage procedure +/:

I. Analysis of the forecasting object, its decomposition to components and subcomponents, specification of their indicators or form of quantification. The concretization of this stage is the topic of this paper.

II. Concretization of general social forecasts and social development conceptions by means of trends and events, assessment of their probabilities and overall desirability, assessment of variant social policies mitigating likely negative impacts.

III. Projection of material life style conditions, assessment of likely positive or negative environmental impacts.

IV. Confrontation of forecasts pertinent to individual life style complexes.

V. Writing up of alternative scenarios of life style complexes.

+/ For a detailed description see the paper "A contribution to the Forecasting of Life Styles", Bucharest, Conference, 1972

The criterion of structuring the life style into components is their establishment as categories, for which long term conception of development can be formulated. Furthemore, these components are interdisciplinary and complex in their character and are therefore usually established as research problems or conference themes. This facilitates the retrieval and assessment of forecasting information, the furnishing of ready made interrelated complex forecasts, and, the possibility to confront views of different research groups.

The purpose of quantifying the components and subcomponents by means of both material and social indicators is, in particular, the derivation of variant social policies under constant material conditions of development. In other words, the material conditions of development may be the same or similar in different countries, but due to unlike social conditions or social model of development different life styles may be observed. This makes the suggested approach universal as regards the provenance of input information: one can analyse global trends, influencing the majority of countries, and search for alternative implications due to social policies available.

Of course, material and social conditions may sometimes cross-impact with each other to the extent that they can be discerned only as amalgamated factors of development. The following survey of ten components and their indicators is necessarily incomplete and its mission is to focus the discussion more on the way of structuring the life style phenomenon than on its substantive problems.

PERSONAL CONSUMPTION

The general conception of consumption development is underlined by its function both as a means of developing the human personality and as a means of motivating the people to engage in improving the production forces. At the same time it is necessary to provide subsequently for satisfying the needs of higher and new character.

Indicators	
material conditions	social conditions
Consumption goods /complex assortment of clothes, household appliances, cars,food.../	Periodicity of opening hours in shops
Consumption of services /washing, cleaning, catering, car services ../	Duration of attendance, waiting time per one purchase
Business facilities /shops, service facilities,hotels../	Ratio of goods ordered by telephone
	Average distances of shops from homes
	Ratio of needs changing its form from goods to services

CHARACTER OF WORK

The general conception of changes in the character of work is based on taking full advantage of scientific and technological revolution entailing, in particular, a decrease in the amount of physical work and simultaneously bringing about higher requirements on the intellectual and sensory development of man.

Industry /number of factories, value of the technology and raw materials, share of automated machines .../	Working relations and modes of cooperation
Agriculture /land area, value of buildings and equiplment, number of employes../	Ownership conditions
Services /facilities, buildings, personnel../	Wage and social allowances regulations
	Working culture and hygiene /breaks,canteens, health services/
	Working environment /level of noise,exhalation/

QUALIFICATION AND EDUCATION

The general conception of raising the level of qualification and education follows the need to provide a general educational background and its life long continuous improvement not only as a preparation for one's own professional career, but also as a precondition for developing the creative forces and manysided activities of the whole population.

Schools /of all types, equipment, personnel../ Informal education facilities/clubs, public courses, TV and radio programmes../ Academies of sciences and research institutes /equipment, number of scientific personnel, expenditures on research .../	Percentage of: external students, postgraduate students, women grad. Ratio of humanities versus technical subjects in public lectures Number of regular listeners to TV and radio courses Structure of salaries /teacher professors, scholars .../ Number of scholars per life style problems

HOUSING

The general conception of development in housing provides a rapid build-up of high class dwellings as a priority in securing a high living standard of the population. Future housing needs must be forecast with regarding the complex relations with trends in urban transportation, household services, new construction technologies and materials etc.

Flats /structure of flats according to equipment,area,site../ Settlements /housing environment in towns,cities,villages/ Housing services /security facilities,police stations, maintenance services ../	Ownership relations,taxes, hire and rent regulations Average waiting times for a new flat Character of flats according to social structure of tenan Average commuting times to shoping, working, ..

COMMUNICATION

The general conception of development is based on a complex approach to assessing both transportation and information trends as one system. The efficiency, interchangeability, speed and convenience are to be respected as criteria common to all developments in communication.

Transport network /structure and length of roads,motorways, railways../ Vehicles /numbers, types, functions of: automobiles, buses, aeroplanes, ships; services facilities../ Information network /numbers, functions of: TV, radio, post office facilities, press ../	Commuting times in various types of settlement Periodicity and convenience of time tables Number of passenger-miles per various types of vehicles Periodicity and variability of TV and radio programmes Rapidity of post services

LIVING ENVIRONMENT

The general conception of preserving the living environment is focused on the heightening of its biological-psychological quality to meet the needs of society as a whole. In perspective, the stress will be on the reduction of industrial and urban exhalation and pollution.

Recreational areas /parks, forests, reservations/ Distribution of areas for settlement, industry, communication, agriculture/ Climate /temperatures, precipitation../ Pollution /CO_2, SO_2, DDT, smog, smell, noise ../	Efficiency and further development of environment legislation Research expenditures on devices for reduction of exhalation Organization and cooperation in the struggle of corporations for preserving the living environment

POPULATION AND HEALTH CARE

The general conception of development is aimed at increasing the physical and mental abilities of the population with regard to the future living tempo and the character of work brought about by the scientific and technological revolution. It is the development of all human features as social values that is the objective of the care about population.

Demographical factors Hospitals / number of beds, personnel, health care institutes../ Sporting facilities /playgrounds, clubs, instructors/ Recreational facilities /campsites, swimming-pools/	Periodicity of public health inspections Forms of agitation for a healthy way of living Structure of stress causes Average distances of sporting and recreational areas from homes Population policies Drugs and alcohol abuse legislation

LEISURE

The general conception of leisure development is the increasing of free time available for the development of new and creative human activities. Simultaneously the conditions for a diversified expenditure of leisure time have to be provided.

Leisure spending facilities /theatres, clubs, libraries, entertainment facilities/ Shortening of working time brought about by the increase of productivity of labour	Leisure activities structure Ratio of active to passive leisure activities Periodization of vacations Periodization of working time Variability of entertainment programmes Preferences for spending leisur

SOCIAL CONTACTS

The general conception for developing social contacts is the emphasis on socialistic relations among people, on mutual collaboration of working people, on political activity and public life involvement, on the strengthening of family ties etc.

Housing conditions according to family structure Material equipment of households with respect to engagement in sporting, social, cultural home activities Number of employed married women	Structure and trends in generation conflicts Participation of the family in children's education Availability of choice and frequency of social contacts Number of people participating in public activities

HUMAN VALUES

The general conception of human values development is based on a complex fostering of social-economic, political and moral securities.

Indicators of gross national product Natural wealth	Political and social establishment Policies and norms of social security Degree of satisfaction of altruistic needs /care about old, invalid, poor people/ Number of individuals subject to loss of life meaning /lonely, disabled people, criminals/ Esthetical norms in industrial design, in cosmetics, eating.. Governmental subsidies to public health care, to families with more children ..

THE QUALITY AND PERSPECTIVES OF THE TECHNOLOGICAL CIVILISATION

By Valerio Tonini
Director, La Nuova Critic

Premise

The possibility of forecasting an evolution of satisfactory quality cannot overlook two fundamental conditions:

1) the organisation of an advanced technology (cybernation) which is truly the logos of the technique and science of praxis; and

2) the reconstitution of anthropological reason, which is basic to the cultural evolution of man's being, of his thinking and acting.

These two basic conditions must enable us to specify, with due commitment, the instruments (first condition) and the goal (second condition), by virtue of which it is possible to pronounce judgement on evaluation, feasibility and desirability in every aspect of development.

I. Motivation of the research

There now exists an enormous literature illustrating the different forecastings which can be made on the world's technological future, sometimes in gloomy hues, other times in highly confident tones. Until yesterday, the gloomy, apocalyptic hues resulted from

literary, philosophical and psychological inspiration, while technology was somewhat confidently predicting that it would redeem humanity. We know about the grandiose research projects undertaken by specialised institutes, especially American, on technological forecasting. Nevertheless, today serious doubts are beginning to arise on the credibility of the programmes conceived. On the other hand, developing techniques is a process which appears to be irreversible, even if it results in creating growingly complex structures which threaten to elude human capacity for guidance and control, despite the fact that mankind today possesses such resources in material, fuel energy and instruments that it should be possible to develop high-level life models. The reasons for so much anguished insecurity, already brought to our attention so many times, can be summarised briefly thus: there is a lack of value references which are essential for making different, possible decisions and obtaining satisfactory results from an advantageous utilisation of the indisputable technological capacities in man's possession today.

In recent times, there have been many authoritative exhortations, such as those advanced in the UNESCO-Faure report, to propagate technological and scientific education; yet, despite these initiatives, our society lacks something still deeper to answer the needs of the "new man", "who no longer belongs by any means to a pastoral, agrarian, artisan or manufactory culture; indeed, before long he will be obliged to move on to a type of rational organisation, without which mankind's survival would be highly uncertain and certainly subject to crises and setbacks -- warfare and ecological disaster -- that could prove fatal.

All this is now well known, and I maintain that this is the reason why the question of comparisons in the desirability of quality-of-life models is being studied by Group 3 of this Conference.

There is considerable curiosity afoot to understand why the futurology of the so-called think tanks has become more and more

a perspective of impending crises, as indicated by the famous MIT report, sponsored by the Club of Rome. Why do so many good proposals and programmes conceived on a vast scale leave us so discouraged? Why, particularly, do they fail to evoke a lively interest in the young generation, the first we should expect to look forward into the future?

I reply without hesitation that many ambitious programmes fail because they lack human civility and a sense of man's participation in the commune humanitatis corpus (Cicero).

For obvious reasons of time and space, these notes can only be summarily informative on the results of a study project launched many years ago when, immediately after World War II, we began to perceive the need to define the responsibility science and technics bear in producing the climate of uneasiness afflicting the world today.

For the men who have lived through what we have called the long zero year of the atomic age, from 1900 (Planck's quantum discovery) to 1945 (Hiroshima), that urgency arose not from any philosophical reflection but rather from the need of enormous masses to work the land or crush stones; frustrated in their essential human requirements, they turned to the scientists to ask why they toiled so hard and suffered so much without hope. We had well undestood that technology could have assumed the full responsibility of completing what the machine had begun to give us -- man's freedom -- but we also had to acknowledge that no man of science could explain why the worst damage wreaked by scientific development had been the perversion of man's life and work. The days and labours of mortals seemed to succumb to an historical fatality which rendered them wholly futile.

The dramatic inception of our research occurred when the unlettered workers and stone crushers and we ourselves, although committed every day to make choices for which we had to bear the responsibility, pondered three questions which have always roused man's spirit and which Kant graphically summarised:

1) what can I know?

2) what must I do?

3) what can I hope for?

Without answering these three questions, no human design can come to life. Nor is it possible to answer only one of them; the reply would be nil. We have defined "man" as he who asks these three questions and "judges" according to them (1)

2. Technology and epistemology

The first question requires an epistemological reply. It was not easy to give it, indeed any reply seemed impossible when in 1935, Husserl denounced the "crisis of European science as an expression of the radical crisis of life in European humanity" (2).

A valid reply, impossible then, should have lead to a clear formulation of the intercurrent relations among science, technics and society. Our first step was to establish that these relationships are dominated by a single operative judgement, which "verifies" the following postulate (I. 1) and the successive definition (I.2):

I.1 Man is that living being who by nature possesses the capacity to modify his surroundings; he knows that this capacity is progressive and that it poses the condition for developing human society (3).

---

(1) V. Tonini: Storia del destino umano, Rome, 1945

(2) E. Husserl: Die Krisis der europäischen Wissenschaften die transzendentale Phänomenologie, Matinus Nijoff's Boekhandel, The Hague, 1954.

(3) This postulate leads off my book Strutture della tecnologia: cibernetica e automazione, Armando, Rome, 1964. It concludes a long phenomenological research into the physical principles of knowing, and need not be repeated here.

I.2. We define culture as the human, individual and collective formation acquired in a given ambiance, natural and historical, through a three-fold, integrated process of information, action and opinion, seen as an equilibrated development of the individual and of society (4).

The analysis of structure bearing on the modern technics of production (and project planning) has resulted in a formal, highly refined theory originally called the theory of processes, which has now become, under one aspect, the theory of informational processes and, under another, the science of systems. Following theoretical and mathematical research, which found an immediate respondent in electronic developments, today technology, as a science of organisation, has become a truly autonomous science of the praxis, or logos, reason of the technics. It makes no reference -- nor does it submit -- to any philosophical premise but rather connotes an evolutive process toward an increasingly accentuated rationalisation of human procedures, ultimately introducing us to the cybernetic rationality which should realise the so-called technotronic age, or whatever one prefers to call it. We defined cybernetic structure as "a time-space organisation of multiple elements in which variations of state do not follow a chance stocastic course but rather an ordered evolution from within the structure itself via a suitable informational system, to achieve a determined goal, also to vary unforeseen internal and external conditions."

Simultaneously, to the studies on the rapid passage from manual work to the scientific organisation of the productive processes, the time was ripe for the passage from the elemntary theory of information, according to the lines laid down by Hartley, Shannon

---

(4) This definition was used as the basis of an unpublished course on synetic pedagogy. Cf. Informazione e società, q. XXV, in "La Nuova Critica."

and Wiener, to the general theory of information processes which, being endowed with memory and feedback, ultimately completed the cybernetic framework, so that its evolutive nature was better understood.

This double itinerary, engineering and informational, ended in the formulation of the epistemology of systems.

To the question "What can I know?" the epistemology of systems, benefitting by rigorous and well formalised semantics, no longer replies with a single explicative schema of reality, of the necessary type, and not even with a wholly probable model, but rather with the complementary and coupled use of four paradigmatic classes of diverse systems, able to offer an adequate representation of different types of processes which function simultaneously in Nature's complex, multiform structure. These four paradigmatic classes are: deterministic systems, stocastic or probabilistic systems, interdeterminate (in the quanistic sense) systems and cybernetic systems (5).

Since epistemological construction was obtained through an analysis of the development of information, more than a theory of knowledge it is a theory of learning. Thus, we come to form that cybernetic rationality for which every level of knowledge connotes an informational system consisting of suitable chosen variables. This information makes it possible to build a model consistent with reality, establishing and verifying its limits of application. Such a model, in turn, makes it possible to foresee various controllable evolutionary directions; and we know for certain that in no case can the future be determined univocally, although it is possible to draw up suitable patterns of the human mind.

In such a guise, the epistemology of systems has succeded, on the

---

(5) Systems epistemology represent the point of arrival of my work Science dell'informazione, cibernetica, epistemologia, Bulzoni, Rome, 1971, to which I refer the reader interested in this subject.

various levels of information, in linking the logic of thought (cogitata ratio) with the dialectics of thinking (cogitare) and the norm (nomos) of behaviour.

In practice, three procedural phases are distinguishable in this formation:

a) choice of the observable and controllable variables;

b) construction of the adequate representative system;

c) controllable operative models.

The preceding procedures can be more or less easily realised in the ambit of systems which are isolable at least theoretically (an industry, a professional school or an army); but when it becomes a question of complex structure, such as socio-economic systems, affecting vast human collectivities, complete information is impossible, indeed absurd; therefore, the choice of the social indicators capable of integrating the economic indicators which are known and able to furnish the quality-of-life measure one wishes to achieve, constitutes a very controversial problem.

In the past few years, highly complex sociological research -- extremely costly, as usual -- has been instituted in the United States. Concerning the role of the social indicators, Bernard Cazes has written in a recent article (6) that three different research directions are being explored in the United States: the normative school, the objectivistic school and the subjectivistic school. Apparently there is no evidence whatever that they have produced any significant results. If we were inclined to give a "school" name to the research conducted in the ambit of "La Nuova Critica", we should say that an "anthropological school" has been added to the described formation of our "epistemological school", with the explicit purpose of giving a basic orientation to the

---

(6) B. Cazes, Indicatori sociali e contabilità nazionale: le scuole americane, in "Futuribili", n. 54, 1973; translated from "Economie et Humanisme", n. 206, July-August 1972.

choice of those social indicators; this is because we do not believe that they can be formulated independently of a paleocybernetic research carried to the remotest biological origins of every living being's behaviour to determine what makes up the "ratio culture" of a purely abstract and symbolic type -- which distinguishes humanity from the other living species.

3. Anthropology

Once we have established the epistemological essence of the diverse systems of concepts the human mind designs to give a verifiable basis to a rational guidance for its actions, another question arises: what is the human and anthropolitical value of the artifice of the machines projected today, and what will be the incidence of their increasingly artful development?

We reply without hesitation that paleocybernetic research into anthropology, enabling us to conceive the evolution of reason from predecessor bios as an informational process for which the science of man, the history of man and the reason of man are all one thing, has given us more faith in the possibilities of utilising technics than could ever exist where the reason for life is generated from an aleatory combination of chance and necessity, such a J. Monod and innumerable others have put it (7).

The bond between life and reason, between bios and logos, must be looked for even in the first metabolism of the first living cell. This requires selective choices to make sure of the elements serving life and to reject what is harmful. Formulating a suitable hypothesis of the biopsychic simplex (8), paleocybernetic analysis has developed a certain orientative direction for all successive evolution toward "mortals" associated life which, in turn, will

(7) My book, La vita e la ragione, dialogo sul caso e la necessità, which is about to be published by Bulzoni, Rome, is a radical, epistemological refutation of Monod's work Le Hasard et la Necessité.

inspire that "mortal" to build the Parthenon, advance mathematics and read the elctronic microscope. These choices are now irrefutable, of the bio-moral order first, then social and then ethico-cultural, which have made it possible for us to gather together in Frascati today to examine other future choices which we want to be invested not only with a certain degree of probability but also with a coefficient of good quality.

In synthesis, if mankind possesses a cultural memory, it cannot fail to integrate with a predecessor biological memory, from which every living being draws and renews the information necessary for him to live and progress.

In every historical moment, it is the responsibility of men of science to perform the duty of specifying the chains, the possibility, suitability and realistic viability of every human project; therefore, it is calamitous when any one of them thoughtlessly fails to reflect on what the first biopsychical formations, which have made men's associated life possible, might be.

4. Cybernetic rationality and appraisal science: a synetic education

If the epistemological and anthropological premises we have outlined are valid, it would be wise and useful to prepare the greatest number of persons to cultivate a cybernetic rationality so that the epistemology of systems can become an appraising science.

Again we refer to the definition of "information", which is always a choice, at once objective and subjective, and which constitutes information insofar as it serves the receptor. In effect, every item of information should be accompanied by a value coefficient apart from a measure of probability.

We should therefore like to formulate the desire that the recovery of man's prehistory will enable cybernetic theory within the framework of systems epistemology to lead to a solution of concrete problems, for which no one until now has known what methodology to use to confront them -- not so much because the incredibly swift

fourth generation computers were not available but because we had lost the epistemological and anthropological sense of every human judgment that might respond to the three questions repeatedly posed in vain since Kant.

Indeed, it was always meant to refer to a single system of concepts, whatever it might be, while considering all others false, hence to propose, ideologically and authoritatively but not scientifically, a single solution without alternatives. At the first unforeseen clash, such monomania collapses into crises, contradictions and conflicts.

We have thought to premise our epistemological and anthropological research -- whatever calculation one wishes to make of it -- because if there is no clear explanation for the history-science relationship as an informational process, it seems to me that there will be almost no element of judgment on the diverse perspectives which possible alternative scenarios can set forth; and any discourse on "quality", where no epistemological or anthropological reason is given for decisions which could concern mankind's future life, would be bereft of sense.

In whatever decision or choice one wishes to make, the logic of the propositions and the logic of values must participate; both have a common foundation in anthropology, that is, in man's reason as it has been formed and developed culturally. Without this unity, which does not eliminate the innumerable phenomenological and exitential varieties, we shall never succeed in making credible the possibility not so much of defeating but at least of alleviating the conflictual state which has dominated life so exasperatingly until now -- animal against animal, man against man, nation against nation, class against class, faction against faction, revolution against revolution, reaction against reaction, generation against generation. Certainly, all human history, not only political, economic and social but also cultural, is marked by struggle, to such an extent that competition, confrontation and revolt appear to be biologically and dialectically indispensable to the development

of life. Human culture is born and developed from ideological strife, especially the culture which has drawn its evolutive power, still enormous today, from Aeschylus and Sophocles. At any rate, the apocalyptic danger is so imminent today that we must find a certain thread of reason which we can somehow trust, aware that man, while not the arbiter of his future, is in any case responsible for what he does. How do we define this responsibility in choices which are never altogether autonomous? This is why we have posed the question of anthropology as metalogic, metascience and metapolitics, without which nothing can be decided.

But then, the very dangers inherent in technological development have warned us to launch a new, modern psycho-social discourse, a new communication, information, participation. This requires a lateral pedagogy of psycho-formation, to which we have given the name synetics.

Synetics is the methodology and development if information by groups of elements, which can be heterogeneous among themselves (men, instruments, systems) to achieve a teleonomic orientation of their evolution. I should say that this methodology could become operative today, also that it could offer the practical possibility of establishing self-educating communities, promoting problems of participation and self-management and creating cybernetic organisations of production, a largely partecipatory art of government.

To avoid adding delusion to delusion via the technological Utopia, the various structures to control must be reduced to specific sub-systems; at the same time, however, we should be well aware that such sub-systems, generally strongly binding, can be supported by a synetic psycho-pedagogy, able to correct the conflictual instinct which otherwise would be fatally destined to precipitate disasters. The warnings broadcast by the Club of Rome-sponsored MIT report and so many worthy men can contribute nothing toward averting these catastrophes. Thus, it would be folly to heed what Erich Jantsch declared at the NSIA Conference on technological

forecasting (Washington, October 1967) whe he said, as reported by Dennis Gabor, that all we know of man's behaviour leads us to think that the total rationalisation of decisions will eliminate any dynamic whatever from human society; the rationalisation we attempt to acquire through planning is the rationalisation of the foundations of action (9).

Purposely to avoid any confusion between procedural rationality and mechanistic determinism, for some time now we have been specifying cybernetics as, essentially, the science of the degrees of a system's freedom, and pointing out that cybernetic rationality, by the strength of its twofold technical and anthropological matrix, serves not to reduce humanity to a herd of passive serfs or a mass of robots but rather to train experts who can confront unforeseen changes, not only through an adequate technical preparation but also -- and mainly -- through their psychic and intellectual capacity to understand what they must do, which is not always very pleasant.

To arrive at these convictions, psycho-social analysis has had to make a notable effort to recover -- by plumbing strata far deeper than those skimmed by Freudian psychoanalysis -- the first bio-psychical facts on which the choices of man's civilization have been "formed".

5. Man's works

We have insisted on tracing this long research only because it has convinced us that mankind can feel prepared to face its most pressing problem: the situation of technologically advanced work in the immediate future and in its long-range perspectives.

Man's work engages his whole life. But work becomes a wearisome burden to him when it is not invested with the realisation that he has a real commitment to fulfill, towards himself and the whole human community. Work is not a commodity to sell or consume, but

a need to be satisfied and a goal of perfection to be attained.

Unfortunately, technological development, conducted by abstract science not well acquainted with its virtuality, can threaten to plunge today's painful situation into catastrophe -- a situation in which no plan of economic development, whether dialectic or not, marxist or not, would seem to provide a model corresponding to the value of our need for work that gives satisfaction, according to good rules and within a specific, harmonious cultural conditioning. A "desirable future" must gratify this basic demand, and only an acceptable solution can solve the extremely difficult problems of political, productivistic, economic and other forms of participation. Technology must work with this orientation but, in the social changes that will accompany the evolution of production from an automated organisation of the Taylor type to one of the so-called technocratic, cybernetic, man-machine symbiotic society, or whatever one chooses to call it, there will always be the unforeseen factor that could turn out to be a leap into the dark, which cannot be regulated even by the most highly perfected statistical methods, if the "new" we wish to confront is not to be lived as a choice to realise the being of man as man.

Therefore, we have concluded our epistemology with the statement that the knowledge of man is the history of man; but the knowledge of man -- anthropology -- cannot be considered firmly founded until the terms "work" and "knowledge" are welded together into one ethical principle. This principle was not discovered today but perhaps even before that historical epoch when Homeric rhapsodies were beginning to ask questions about the destiny of mortal men. All would be caducity, and Kant's third question would have no results where that unique motivation the Greeks called charis were to be defective. Other people in other times probably used and will use other terms, but the eternal dilemma between the two great systems, necessity and chance, would provoke only useless suffering where, between life and reason, there were

no intervention of a continuity of values, to which we men of science commit our profession -- not with the pretence of discovering the ultimate truth of things, but with the good will of each one of us to put the best of our profession at the service of the associated life.

I believe that these summarily recapitulated propositions are adapted to confront the concrete problems of cultural policy, of research policy and the policy of participatory development, which affect the human collective more than ever today.

WORKING HYPOTHESIS REGARDING THE CONSIDERATION OF THE "QUALITY OF LIFE", OF THE "MODE OF LIFE", OF THE "STYLE OF LIFE"

By Viorica Varga
Sociologist

The present conditions of the scientific-technological revolution (S.T.R.) and of the social-political revolutions raise more and more stringently before mankind problems such as "how do we live? Why do we live as we do? How could we live? Thus the problem of the "mode of life", the "style of life", the "standard of life", the "quality of life" appears as a central theme in researches carried out in recent years. In sanctioned researches, the above terms are considered or assumed to be synonymous. Reference to one or the other term generally depends on the reference of researchers who, assuming to refer to "the same thing", often use different evalutation criteria, reference systems, factor indices and indicators [1], and this makes a comparison or integration of results difficult.

Since a unitary methodology has not yet been developed, the present paper attempts at approaching two categories of problems:

1) General problems related to the comparative description of some historical models of life, determined by the degree of development of the society, and

2) Methodological problems concerning the consideration of the "quality of life", the "mode of life" and the "style of life".

1.

1.1 In order to answer the first question "how do we live?" we must consider the past and the present in view of detecting the structure and the dynamics of human life. The structure and dynamics of human life refer to the transformation of the content of life, the mode of life, the temporal and spatial existence of man, to the content and structure of his culture, to his social relations, to his physical and psycho-nervous health and to man's place and role in modelling and creating his future.

A comparison of two models of life: A) from the Middle Ages and B) from the present period, may be telling in a way:

A. The reconstitution of the typcial biography of a married individual who lived three centuries ago [2] may reveal the following:

- only one of his grandparents was alive at his birth;
- he had four other brothers or sisters;
- he had lost one of his parents before coming of age (15);
- he had 2 - 3 deceased descendants;
- he had passed through 2 - 3 great starvation periods;
- he had witnessed 2 - 3 epidemics in addition to the semi-permanent epidemics such as scarlet fever, whooping cough, etc.
- he died at the age of 52;
- with regard to spatial mobility, the average man very seldom left 40-60 km from his vicinity (except for wars which were a kind of "travels");
- with regard to human relations, he had social relations with a few persons from his neighbourhood and especially with his family who were his economic, working and entertainment centre;
- his existence was dominated by the agricultural and manufacturing activity;
- satisfaction of material and spiritual needs (in the sense expressed by F. Masini, as a balanced whole of biophysical, psychological, spiritual needs) was guaranteed for a restricted minority [3] rather than for the average man;
- further, the structure of his culture reflected elements related to religions;
- his hopes were particularly related to a super-terrestrial future.

B. The present model of life of an average man in a developed country is markedly different from the above description. Thus:

- life expectancy extends up to the age of 60-65 and the decrease in infantile mortality causes the average man to live for a significant period of his life with his parents, grandparents, children and grand-children;
- The spatial opportunities have been greatly enlarged for man. Traveling and tourism have extended to such a degree that A. Toffler speaks about a "new nomadism" [4]. While in the early XXth century an average man covered about 14,000 km throughout his life, he is likely to traverse at present about 16,000 km yearly (daily commuting to work, tourism, vacations, holidays, etc.);
- Concerning human relations, a trend to be noticed is a substantial increase in the number of relations and the decrease in the duration of human relations, due to the fast changes in the structure of his occupation, qualification and often of his work-place, of his residence, etc. The structure, the number and the duration of human relations, such as the long-term (familial), the medium-term (friends, office-associates, membership of an organisation, neighbours) and the short-term ones [5] (salesmen, barbers, occasional acquaintances on trips, etc.) place demands on the individual and require a clear concept of their content and meaning.
- In the content and the structure of his culture, there is an increase in the specific gravity of lay and scientific elements;
- his expectations and aspirations are related to a not too remote terrestrial future. The place and role of the individual in shaping and building his future increases.

1.2 Of course, this model is approximate, having a relatively reduced generality level, valid only for developed countries and having a suggestive value rather than an analytical one with regard to the changes occurring in the life of an average man. The limits may be more obviously seen if we consider that approx. 2/3 of the total population of the earth live under conditions of chronic undernourishment and starvation, about 1/4 of the adult

population of the globe being illiterate or semi-illiterate, a fact which renders any non-historical and non-spatial handling inappropriate.

It results that a study of the generation of the configuration of various quality-of-life models requires in the first place: a "diagnosis" approach permitting to identify the existing models on a world and/or national plane, approach which would take into account the existing concrete-historical determinations; detection, on this basis, of trends, their prognostical approach enabling thus the democratic projection of the social life in view of a conscientiously desired future. Such an approach may prevent the future-oriented research to reach the situation described by Swift, when Gulliver, visiting the Planning Academy in Lagado, capital of Balnibarbja, found that while professors developed wonderful future plans for agriculture, for machine building and for constructions, the country was in a desperate plight. The future-oriented research cannot depart from the present problems if they expect to avoid the condition of Swift's professors.

In this perspective, we shall try to formulate some methodological clarifications concerning the consideration of the notion "quality of life", "mode of life" and "style of life", indicating their meaning in this paper and suggesting their larger methodological value, under the form of a working hypothesis.

2.

2.1 We think that the common definition of the "quality of life" as being the whole of natural and cultural goods, the quantity, the quality and the variety of goods and services available for all the members of a given society cannot provide a pertinent scientific answer either to the question "how do we live?" or to "why do we live as we do?", questions that seem to us basic when studying the generation of the configuration of the "quality of life". It cannot provide a scientific answer since it is not specific enough meaning that it fails to define the quality, it points to the quantity and does not specify whose life it is all about (a social system, a group or an individual); it overlooks

the attitude of the members of a given social system towards these goods - as mentioned by Pavel Apostol - as well as the value attributed to them by the members of the society in terms of their system of values [6].

2.2 In order to clarify this issue, the quality must be explained as being the expression of essential properties and components of processes, objects, by virtue of which a thing may be distinguished from other things. The change in quality determines the change of the object which represents the unity between quality and quantity.

Within the frame of the notion " quality of life", we consider "life" to be a generic category by which we may in fact understand the social life reported either to a social-economic formation, as a system, or to a social class - a socio-professional group or an individua.

The behaviours of the members of a given social system towards their goods, their needs and aspirations are historically conditioned and linked to the economic systems, to the material living conditions and also to the outlook on the world and to the system of values of the various categories composing the society.

2.3 It results hence that the notion of "quality of life" may be a theoretical research instrument only if it takes into account the essential determinations within a social system and/or within the investigated social groups.

The essential determinations require the consideration of the "mode of life" and of the "style of life" as components of the "quality of life" without which it could not be explained. Both the "mode of life" and the "style of life" [7] have general-historical and concrete-historical determinations.

By "mode of life" having a general-historical determination we may understand the manner in which people reproduce their own social life within the given social-economic formation. The general-historical determinations may permit the identification of "modes of life" corresponding to the historical types of modes of production; these represent the objective conditioning of various historical modes of life based on which the characteristics of a certain mode of life can be outlined. The mode of life is

not directly determined by the mode of production; this is accomplished by means of social relations and first, by the relations of production. Since the determination is conditioned, it cannot be reduced to merely satisfying the material and spiritual needs. Research must also analyse the political determinations under the aspect of the form and content of political regimes; it is necessary to consider the manner in which traditions, the national specific of the system of values, etc. and also the international climate function, since it is evident that different modes of life may exist in the frame of the same determinations (production forces, relations of production), and this requires concrete-historical investigations.

Based on general historical determinations related to the degree of development of the production forces and to the nature of the relations of production dominating within various successive social-historical formations, we may identify "the primitive-communitary mode of life", the"slavish mode of life", the "feudal mode of life", the "bourgeois (capitalist) mode of life", the "socialist mode of life". Naturally, the identification can be made only "grosso modo", since only the last two historical modes of life provide statistical data on the mentioned major factors.

The observation made by Karl Marx in 1857 has a significant methodological value. He said that " the bourgeois society represents the most developed and many-sided historical production management. For this reason, a knowledge of the categories expressing the relations of this society, an understanding of its structure also provide the possibility for knowing the structure and relations of production of all the disappeared social forms, on whose shivers and elements it has been built partly dragging along some still uneliminated remains and partly developing to its full significance what had previously existed only in the bud",etc. And further, "the relations of a preceding formation are found in it, often only in a totally distorted or even parodied form, as is the case, for instance, of the communitary property [8].

Although the above-mentioned general modes of life (having specific particularities within countries) appear as suceeding each other in the historical development of civilization, we may notice their "co-existence" or that of some of their forms within

various present social formations. Thus for instance, we can observe the co-existence of the feudal dominant mode of life with forms of the bourgeois mode of life and with forms of the communitary primitive modes of life (in some African countries) bringing about extremely original combinations; or, another example, the co-existence of the bourgeois and of the socialist mode of life during the periods of revolutionary transitions etc.

2.4 The reproduction of the social life bears the marks of the social classes and groups which achieve this reproduction manifested in "the style of life" of various classes.

By "style of life" we may understand the characteristic manner in which the social classes and groups reproduce the mode of life of the given society and, determined by this, their own mode of existence.

The specific mode of existence results in a specific social consciousness, in some characteristic features of social psychology. It generates specific habits and traditions and leads to the conscious or unconscious promotion of some characteristic values and preferences. Of course, the macro-social behaviours and the individual style of life have multiple relationships. However, the individual style of life may present pronounced independent features due to the relative independence of the social consciousness toward the social existence. At this point it is necessary to emphasize that one cannot speak about a unitary style of life reported to social groups since one may observe a conscious style and an unconscious one within the same class in terms of the system of values of the group in question. We also should keep into account the fact that the frame of various styles of life may include elements taken over, imitations, influences, innovations, etc.

Despite the specificity of the styles of life, it is nevertheless possible to approximate some common features in the system of values and preferences of some large social historical groups, such as: slave-owners, feudals, bourgeoisie. It can thus be deducted that the private property over the production means holds a decisive place within the systems of values promoted by these groups in their social relations with other social groups on an internal and external plane.

We may also approximate psychical and moral features, common

behavioural features, as for instance class selfishness, individualism, racial and/or national arrogance, social intolerance, historical pessimism, etc., manifested in the style of life of these classes.

Despite the variety of historical, geographic, national, racial, religious, etc. determinations, we may also observe some similar features in the system of values of social historical groups such as slaves, peasantry, working-people. Thus, the aspiration to social equity, to a worthy social existence can be found in their system of values. Collectivism, spirit of sacrifice, generosity, spirit of tolerance, historical optimism, etc. are psychical features, moral and social attitudes that can be observed in the styles of life of those social categories. Undoubtedly, these approximations are extremely general[9] and the sociology of the aspirations of large social groups has relatively reduced concrete data available in this respect [10,11,12]. Nevertheless, their in-depth knowledge has a particular importance for the future-oriented social projections. The problem whether the dominant social class within a system can itself determine the major features of the mode of life is one of the most interesting aspects requiring a detailed concrete investigation.

For this reason, we consider that in order to prepare some meta-scenarios on alternative "quality-of-life" models, it is necessary to identify and describe the existing styles of life at the level of the social macro-groups. This requires statistics regarding the social structure of the world at the level of the working class, of the bourgeoisie, of the peasantry, of the landowners, of the intellectuality, of the intermediary layers, etc. It also requires some macro-sociological investigations at a world level concerning the styles of life, the existing trends within them and their comparison, a detailed analysis of the internal structuring of classes, the character and the mouvements of various groups within classes. The investigations may focus on a few essential aspects regarding the styles of life, i.e.:

- the relation towards the production means of the considered group;
- the manner in which they spend their working hours;
- the degree and quality of satisfying the cultural needs;
- the manner in which they spend their spare time - the content and structure of their leisure;
- housing conditions;
- the social status in the studied system.

Investigation of other parameters of the mode of life could be added to the above, such as, for instance, the level of public sanitary services;

- the opportunity for social promotion on the basis of personal capabilities and achievements;
- the general degree of culture;
- the contribution of society in supporting that segment of the population which cannot be considered as a labour force (i.e. children, aged persons, etc.)
- protection of the natural environment to the benefit of society;
- assurance of a general high-spirited frame of mind for the entire society, based on social safety, occupational safety, efficiency in participating in the public life,etc.

Such an approach would permit a more exact approximation of the quality of life and could provide significant and useful data to be employed in the construction of some meta-scenarios expected to answer the question "how could we live?" The model of a communitary society,of dealienized mankind, capable of consciously controlling its historical development was conceived by Marx as an open, self-administering system , centered on man freed from any form of economic, political, national/racial, spiritual suppression or discrimination between sexes, etc. The model of such an antropocentrist civilization requires actual concreteness in terms of the particularities of the modes of life existing throughout the world. The theoretical and practical achievement of such a concreteness in view of constructing some national "scenarios" as component parts of certain meta-scenarios could successfully use A. Gramsci's[13] methodological observation with regard to the need for studying the history of each mode of life in terms of its original and present "rationality" *. The finding of a present non-rationality of certain modes of life which formerly had had a rationality facilitating the historical development, prompted some theoretical and/or practical orientations directly or indirectly aiming at changing or modifying those modes of life on a national and/or world plane. These orientations have been found to be rather heterogenous, including: theoretical and practical programs for revolutionary social-political strategies and tactics; theoretical and practical-political projects for reforms;contesting or protesting slogans against one or the other aspect of the existing mode of life; models describing some future societies[14,15] or "planning" future societies[16],outlined in a humanistic spirit, etc.

Despite the variety of these orientations, they reflect the gradual shaping and occurrence of a new system of values which combines the need for man's emancipation from any form of exploitation and suppression with the need-aspiration for his continual development in and by his own creations and within his self. The main elements of these new requirements can already be seen, among them, R. Richta[17] mentions the need for a creative activity, for multilaterality and for individual activity, for a permanent cultural development; the need for clear human relations and participations, the need for the inner unity of the personality, the need for freedom of movement and of information, for a free physical activity, the permanent need for contacting the beautiful and the nature, the need for having perspectives [18].

The identification of the trend involving the occurrence of a new complex of values may lead to the development of some meta-scenarios-using sufficient statistical data - based on the question :" What if,..":

- no country had private property on production means and so all the countries made use of their riches existing above and under the ground;

- what <u>if</u> the material and spiritual production in each country were to the benefit of the entire society;

- what <u>if</u> the social retribution were based on the quantity, the quality and the social importance of the activity of each separate individual in a given society;

- what <u>if</u> the 200 billion dollars spent annually for armament were strictly assigned for doing away with the underdevelopment - (compared to the 7 billion dollars actually allotted to this purpose) - concomitantly with the strict exclusion of world and local wars until the year 2000;

- what <u>if</u> all the existing technologies and the inventive technical intelligence were used for the benefit of man, not against him;

- what <u>if</u> a free cooperation based on full equality, without any discrimination were achieved;

- what <u>if</u> illiteracy were eradicated in the shortest possible time lapse and a "planetary education" TV-based world system were developed (a special programme) based on the recognition and observance of the equality and originality of all peoples, banning as backward and anti-humane any kinds of national or racial prejudices, or discrimination between sexes;

10. Paul-Henry Chombart de Lauwe, For a Sociology of Aspiration, Ed. "Dacia", Cluj, 1972.

11. Maurice Duverger, La democratie sans le peuple, Ed. 1967 Paris, pp. 45, 102.

12. Johan Galtung, Images of the Year 2000. A Synthesis of the Ten Nation - Study. European Coordination Centre for Research and Documentation in Social Sciences, Wien, 1970.

13. Antonio Gramsci, Marxismus, Kultura, Müvészet, Kossuth Könyvkiadó, Budapest, 1965, p. 129-131.

* Along these lines, by warning against some vulgarizing simplifications, Gramsci mentions that if a certain mode of life, of thinking and of action was given "freedom of a city" within a given society only for having been proper to the dominant class, this does not mean that this mode itself is irrational and should be disavowed without capitalizing its useful elements. However, as soon as a mode of life, of thinking and of action has somewhat become irrational, the fact in itself is highly important and must be revealed under all its possible aspects. This may facilitate at the beginning the change in habit patterns by introducing the historical mode of thinking which will then facilitate the actual changes together with the change in the conditions.

14. Johan Galtung, Future Societies, Paper presented at the VIIth World Congress of Sociology, Sept. 1970, Varna, in which the author advances the model of four types of societies, as follows:

Model I	Model II	Model III	Model IV
Conservatory	Liberal	Revolutionary	Post-revolutionary
Feudal	Private Capitalism State Capitalism	Socialist	Communist

The description is based on 10 parameters. The description of model IV is of a particular interest. It makes an original use of Marx's outlook, considering that the communist society provides the combination between equality and self-achievement.

15. Magoroh Maruyama, A New Logical Model For Future Research, report delivered at the Third World Future Research Conference, Bucharest, Sept. 3-10,1972, p.3. The author suggests

the development of some "heterogenistic researches" in which "goals are generated from "grass-roots" by various ethnic groups, social groups, age groups, individuals, etc. An overall system is developed to combine these diverse goals and their alternative ways of implementation into symbiotic networks".

16. Dennis Gabor's conception of "open-ended planning," H. Ozbekhan's conception on a General Theory of Planning, J. W. Forrester's conception on planning in a complex dynamic systems model, C. Sinclair's conception on the incorporation of health and welfare risks into technological forecasting, J. McHale's conception on the necessity for developing responsibilities at all levels in view of a "total restructuration of our manner of conceptualizing the existence"etc.

17. Radovan Richta and co-workers, Civilization at the Crossroads, Ed. Politica, Bucharest, 1970, p. 206.

18. Eleonora Masini, Space for Man, IRADES, -Edizioni Previsionali - Rome, 1972, Part 1 - 2 accomplishes an outstanding synthesis in a humanistic outlook of the basic human needs, pointing to the uniqueness and integrality of man in his biophysical, psychological and spiritual tri-dimension and emphasizing that the recognition of man's uniqueness is the point of synthesis between man and the community.