

SOCIETAL LEARNING AND THE EROSION OF COLLECTIVE MEMORY

- the role of international organizations in combatting global amnesia *

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International organizations have a vital role to play in the emerging information society. They are often seen as custodians of international collective memory. But in addition to this « maintenance learning » function they can play a vital active role in « innovative learning » - in the collective learning of new modes of responding to the crisis of the times. This paper focuses on the limitations and possibilities of such collective learning.

Introduction

Given the current period of budgetary crisis in the international organization community and elsewhere, it may well be asked whether consideration of « the utilization of international documentation » at this time can lead to significant conclusions. The report of the 1972 Symposium indicates a range of user problems which remain valid (1). Budgets have however been contracted rather than expanded since then. Further the hopes for major inter-agency information exchanges, particularly at the computer level, have been largely abandoned or focused on narrowly specialized domains. Those who earlier expressed concern are now resigned to the fragmentation of international documentation. Relations between potential collaborators in any such exchanges have been eroded by priority attention to basic programme concerns within each agency. In many cases where there has been a real cross-system need this has been met by external services possibly established by a commercial enterprise at the national level. Given this level of activity, the recommendations of the 1972 Symposium still stand as a minimal adequate guideline.

On the other hand the period since 1972 has witnessed the advent of the pocket computer which has changed peoples' perception of the credibility of the « computer revolution ». There have been many studies of the « information society » now and to come. Computer terminals are creeping into offices and the « paper-free office » is announced for the immediate future. In homes such devices are used for education and amusement (attached to television). International and national agencies are now experimenting with such devices - each in their own way in support of their own system. The pressure to do so is great because of the rapid spread of international satellite-linked data networks and the multitude of data bases now available via them.

The boundless optimism of those associated with the information society revolution is far from being matched by those concerned with the world problematique. Crisis has been heaped on crisis and international agencies are increasingly perceived as helpless observers of these worsening conditions. Loss of confidence in them, as reflected in their budgets, is part of the general loss of confidence in established institutions.

In this context it would seem to be shortsighted, if not simply foolish, to attempt any conventional inward-looking evaluation of the problems of « utilization of international documentation ». The dramatic times in which we live would seem to call for a new look at the context within which the objectives of « international documentation » are defined and perceived by the user, whether actual or potential. Not to do so would simply beg the well-known management quip : « Having lost sight of their objectives, they redoubled their efforts ».

The danger in the emerging information society is that many traditional library dreams of total computerization and in-depth cataloguing may too easily become a reality. The question is not whether this is worthwhile, especially to the user. In this transition period a major concern should be with whether such innovations are assessed within a broad enough framework in the light of needs during social crisis and upheaval. The latter concern is of course a special responsibility of international documentation services. Are the right questions being asked - are there better questions to ask? It is the search for such a framework, to stimulate better questions about utilization, which is the prime thrust of this report.

Social learning and the world problematique

Given the continuing insistence of international agencies on the complexity and urgency of the world crisis situation, it is unnecessary to summarize this point here (2). In response to recognition of this world problematique a new generation of perceptive studies is now emerging. What is surprising is that they stress similar points which are relevant to the objectives of any international documentation system.

As a first example. Ambassador Soedjatmoko, currently Rector of the United Nations University (*), stressed the importance of the « learning capacity of nations » :

« The capacity of a nation - not just of its government, but of society as a whole - to adjust to rapidly changing techno-economic, socio-cultural and political changes, on a scale which makes it possible to speak of social transformation, very much depends on its collective capacity to generate, to ingest, to reach out for, and to utilise a vast amount of new and relevant information. This capacity for creative and innovative response to changing conditions and new challenges I would like to call the learning capacity of a nation. This capacity is obviously not limited to the cognitive level, but includes the attitudinal, institutional and organisational levels of society as well » (3).

In 1979, a recent report to the Club of Rome was published (5). It argues:

« Whoever chronicles the history of the 1970s will see clearly what we perceive only dimly now. Not only is a critical element still missing from most discussions on global problems, but the most striking analyses of the world problematique are diverting attention from a fundamental issue. What has been missing is the human element and what is at issue is what we call the human gap. The human gap is the distance between growing complexity and our capacity to cope with it. Distinguishing this notion of learning from schooling does not mean that this report will ignore education which is a fundamental way and a formal means to enhance learning... Further, we shall contend that not only individuals but also groups of people learn, that organizations learn, and that even societies can be said to learn. The concept of « societal learning » is relatively new and stirs some controversy. Some contend that it is merely a metaphor that distorts the meaning of learning. Doubtless the concept of societal learning has limits, but we nonetheless shall maintain that societies can and do learn, and we shall not hesitate to cite evidence of learning processes at work in societies ».

In 1980, Alvin Toffler (author of «Future Shock») produced a book (6) reviewing the positive factors associated with the current period of crisis. In it he stresses the importance of « social memory » and how it is being revolutionized by the changes in the « info-Sphere » (pp. 192-193). He points out :

« Our remarkable ability to file and retrieve shared memories is the secret of our species' evolutionary success. And anything that significantly alters the way we construct, store, or use social memory there-

(*) The paper is an extract from « Utilisation of International Documentation; introductory report for Panel III - which appears in « International Documents for the 80's: their role and use: proceedings of the Second world Symposium on International Documentation, Brussels, 1080 (Pleasantville, NY, Unifo 1982, pp. 335-361) edited by Th. Dimitrov. An unpublished French version is also available from Th. Dimitrov, United Nations Library, Palais des Nations, Geneva. The text reproduced here has been slightly modified but includes the references and annexes previously omitted. The original paper was also presented to a meeting of the Forms of Preservation sub-project of the UNIGPID project (Geneva, 1980).

fore touches on the well springs of destiny. Twice before in history humankind has revolutionized its social memory. Today, in constructing a new info-sphere, we are poised on the brink of another such transformation...

What makes the leap to a Third Wave info-sphere so historically exciting is that it not only vastly expands social memory again, but resurrects it from the dead.

The computer, because it processes the data it stores, creates an historically unprecedented situation : it makes social memory both extensive and active. And this combination will prove to be propulsive » (6, pp. 192-193)

Unlike earlier hopes for a « world brain », a functioning information infrastructure (7) is emerging very rapidly which will accomplish more than was desired by those who first reflected on the future of information. (Recent years have nevertheless seen the rebirth of a World Mind Group (8)).

But Toffler makes the point that :

« Unless we incinerate the planet and our social memory with it, we shall before long have the closest thing to a civilization with total recall » (6, p. 193).

This optimistic argument conceals a basic problem to which the Club of Rome report (above) is more sensitive. For whilst technically it may well be possible to recall any item of information, the problem lies with how the user is to use such a facility given the limited processing capacity of the brain.

And, more specifically, how is he to learn from it and to what extent will it facilitate social learning in relation to the world problematique ?

This basic constraint emerges more clearly in the Dakar Declaration (1979) of Informatique pour le Tiers Monde (9) : « The key element of human communications- the ordering and transmission of information - is tending to become a source of mis-communication. The scientific and technological breakthroughs which have led to the informatics revolution are way ahead of the learning process of human society. This cultural lag is the most serious challenge to a comprehensive view of the implications of informatics. It is a matter of values, of organizational capacity and transformation in mental structures ».

This statement, however, itself fails to distinguish between the collective and the individual dimensions of the problem. These are explored in the following sections.

1. Nature of collective memory

Learning implies memory, whether in the case of the individual or of society.

« That experiences influence subsequent behaviour is evidence of an obvious but nevertheless remarkable activity called remembering. Learning could not occur without the function popularly called memory... So-called intelligent behaviour demands memory, remembering being prerequisite to reasoning. The ability to solve any problem or even to recognize that a problem exists depends on memory (17). What then is societal memory ? How is it related to the international documentation system ?

In the past, as Toffler notes (6, p. 192), « social memory » was stored in the minds of individuals as « history, myth, lore and legend and transmitted... to their children through speech, song, chant and example... all the accumulated experience of the group was stored in the neurons and glia and synapses of human beings ». This is still the Case in many countries and sectors of society. But anthropologists do not appear to have studied « folk memory » or « cultural memory » as such. They focus on traditions as « values, beliefs, rules, and behavior patterns that are shared by a group and passed on from generation to generation as part of the socialization process » (16). This verbal tradition has largely been replaced by one based on texts.

Biologists on the other hand have tentatively recognized a « noosphere ». The age of ecological enlightenment has brought with it a new term, the ecosphere, which implies a responsible stewardship of Earth. Beyond and superimposed on these spheres lies another dimensional sphere, the noosphere, a figurative envelope of conceptual thought, or reflective impulses produced by the human intellect... « It is not scientifically measurable, of course, but its presence is strongly felt and its influence is all-pervading » (17). The concept was first formulated by Vladimir Vernadsky and elaborated by Pierre Teilhard de Chardin. This approach has not focused on memory. As one biologist remarks, however:

« Although we are by all odds the most social of all social animals - more interdependent, more attached to each other, more inseparable in our behaviour than bees - we do not often feel our conjoined intelligence. Perhaps, however, we are linked in circuits for the storage, processing, and retrieval of information since this appears to be the most basic and universal of all human enterprises ». (17a, p. 14)

Classical Greek philosophy developed a concept of the world soul which was related to memory. Little attention has however been given to recent philosophical investigations of social minds, as « syntheses of individual minds into wholes with new minds » (18). This is also the case for the group mind as applied to national mind and character (19). Psychologists may refer to « culturally shared knowledge... thought... This is merely an idealization... not to be confused with reality » (60, p. 9). Scientists may, however, refer to « the store of human knowledge... achieved a corporate, collective power that is far greater than one individual can exert ». (20) The concept of group mind was examined and discarded by sociologists in connection with public opinion. This is a collection of individual opinions on an issue of public interest. It is considered to have characteristics that make it something more than the sum of individual opinions on an issue. Its function as social memory does not appear to have been explored. The concept of collective consciousness was developed by Emile Durkheim as a derivative of Rousseau's general will and Comte's consensus. But again there is little concern with memory, although Jung's concept of archetypes of the collective unconsciousness is closely related to it. The distinction between consciousness and unconsciousness may not be important in relation to memory (*).

Educators, at least in the light of the Encyclopedia of Education (29) do not appear to have any interest in social memory, or even social learning as such. Programmes in support of international understanding, such as Unesco's, do not clarify any aspect of social memory even if they ensure the dissemination of cultural traditions. The new Unesco programme on cultural heritage also has no explicit concern with memory. Recent use of the term planetary consciousness by many alternative groups (29) is not related to any memory function.

It is to be expected that a social memory concern would emerge more explicitly in the development of the classification of knowledge from Aristotle through Juan Huarte, Francis Bacon, Diderot, to Dewey and Otlet and their successors (22, 23). But whilst such initiatives are effectively attempts to impose some organization on social memory, their proponents do not appear to be concerned with its nature. Thus although there is a study of classifications in their social context (24), there is little to be found on the social impact of classification schemes. A discipline such as the history of ideas is not concerned with the nature of collective memory. The power of such impacts, is, however, illustrated by Jacques Attali in terms of styles of music as coding systems reflecting social structures and presaging new structures (25). But he does not consider any memory function.

Clearly social memory is an elusive and poorly explored phenomenon. Instead of attempting to clarify its nature as a psycho-social phenomenon, the search can be switched to the repositories of social memories. This switch necessarily abandons the preoccupation with how societies internalize recorded knowledge and focuses instead on how knowledge can be physically recorded and disseminated. Societal learning is not, however, achieved by simply recording and disseminating knowledge. It must be « absorbed » by society. How societal learning (or group learning) takes place remains unclear, as the Club of Rome report stresses. Before commenting on modern systems it is important to note the role of encyclopaedias as repositories. Initially these were often conceived as « mirrors » of the knowledge of mankind-which reinforces the distinction noted above. Even in recent years national or ethnic encyclopaedias have been deliberately created to orient social consciousness. Deliberate efforts have also been made to move beyond the traditionally passive role of the library and museum, as with Paul Otlet's Mundaneum which assembled 17 million

(*) « A structural model may be conscious or unconscious without this difference affecting its nature. It can only be said that when the structure of a certain type of phenomena does not lie at a great depth, it is more likely that some kind of model, starting

as a screen to hide it, will exist in the collective consciousness. For conscious models, which are usually known as « gems » are by definition very poor ones, since they are not intended to explain phenomena but to perpetuate them ». Claude Lévi-Strauss, Structural Anthropology, London, Allen Lane, 1968.

items (26). The social significance of such initiatives was given its most eloquent form in the H.G. Wells proposal for a « world brain » (27). With the advent of computers, the concept has been refined under the stimulus of information scientists such as Manfred Kochen (28), Harry Schwarzlander (29) and D. Soergel (30), who are linked through the World Mind Group (8). Note also the recent book by Peter Russell : « The Global Brain - (1982). The reality today is however represented by a multiplicity of information systems, whether national or international, specialized or general, computerized or not and whatever the degree of interlinkage via data networks (31, 32). In this context the above concern with social memory is reduced to a preoccupation with computer memory and processing power.

2. Nature of societal learning : the collective user

Emphasizing societal learning raises the important point of a « collective user » whose requirements are clearly somewhat different from the individual user-learner. How does such a user learn ? This relates to the problem of the « learning capacity of nations » (3) and to learning by international agencies, possibly via their international documentation systems.

Although it was not possible to clarify in the previous section how knowledge was internalized by society, the Club of Rome report gives further precision to this process.

« Our continued survival is testimony that humanity indeed learns... So we have to reconsider what is meant by the statement «humanity learns ». Does the statement imply - indeed demand - that learning occur at the right time and on a scale sufficiently large not only to avoid disasters but also to conclude a century, so much traumatized by successive follies, with a gain in peace, dignity, and happiness ? » (5, p. 118).

The report notes :

« The conventional, often unarticulated, conception of how societies learn usually starts with one or more centers of concentrated competence as the emanators of new discoveries, theories, beliefs, and solutions. These new ideas are then disseminated to larger circles of people and to the public at large. This model of societal learning distinguishes two separate steps : one of distinct discovery and another of less distinct dissemination. The roles people play in this process are likewise differentiated : some invent and others assimilate. The role of society at large is reduced to adjusting to and consuming the discoveries and knowledge produced in centers of expertise. It is easy to see that this conception entails more teaching than learning. « The unavoidable consequence of this view of societal learning is elitism, technocracy, and paternalism. What is omitted is the fact that meaning and values - decisive for learning » are products of society at large, not of specialized centers. Despite all their technical advantages, the bodies of knowledge, technologies, knowhow, and theories produced by such centers contain inherent shortcomings - they are too often divorced from the social context. They tend to reproduce themselves according to their own internal logic. This autonomous and self-reproducing development accounts in large part for the fact that so much of societal learning is maintenance learning. « Innovative societal learning seeks to restore active learning to those in society conventionally confined to a passive role of assimilation. Key to this goal is participation that goes beyond mere invitations to accept given products. To encourage innovative societal learning, true participation must enable people to open and inspect the « black-boxes » of knowledge, to question their relevance and meaning, and to re-design, re-combine, and re-order them where necessary. Effective participation therefore does not mean paying lip service to those who in the past have been deemed to count less than others, but rather ensuring a real contribution of the entire society ». (5, pp. 80-81).

Elsewhere in the report a distinction is however made between the need and possibilities for accelerating learning processes of decision-makers at all levels of institutional learning, on the one hand, and the equally urgent necessity but greater difficulty of enhancing the more general and slower processes of societal or « public » learning, on the other (5, p. 127). In considering the use of international documentation systems, it would of course be convenient to focus only on the first. The report makes it clear, however, that the two must advance hand-in-hand or the decision-makers will be unable to communicate effectively with the public. The phrasing of the previous paragraph easily leads to the error of assuming that in either case it is still only a problem of individual

learning. In commenting approvingly on the Club of Rome exercise (5, pp. 138-139), for example, the Deputy Director General of Unesco cites Unesco's concept of the « learning society », which appears to mean life-long education for the individual (33, pp. 160-164, 182, 263). But the Club of Rome report is quite explicit that *collective/societal learning* (« macro-learning ») is to be contrasted with *individual learning* (« micro-learning »).

« Much research has been done on individual learning processes; hardly any research is done on organizational or group or societal learning. This is clearly a new research area ». (5, p. 137). Given the urgent tone of the report, and the absence of further information, those responsible for international documentation systems are placed in an embarrassing position. They clearly have a key role in a vital process about which little is known. Furthermore, from the above comments it would appear that they are likely to be contributing mainly to maintenance learning because of the manner in which their function is currently conceived and defined. Given the time lag before the appropriate research is done, what can be done now to clarify the obstacles to societal learning in order to identify the role of such documentation systems?

3. Limits to societal learning

It is now appropriate to return to the question of whether there are « no limits to learning ». Some definite limits were identified above for the individual learner-user (*). It is easier to argue that society's learning capacity is unlimited, especially if it is assumed that the component individuals each focus on overlapping portions of the body of knowledge (**).

There is a danger in such optimistic slogans that they divert attention from the nature of the obstacles to societal learning - obstacles which have prevented society from responding with greater maturity and insight to the crises with which it is now faced. The Club of Rome report cites the case of increasing worldwide illiteracy as an example of wasted human learning potential. In 1980, 820 million, namely 20 % of the world population, are illiterate following several decades of Unesco literacy programmes. This indicates a very practical limitation on any theoretical possibility of unlimited learning. It is important to explore such limits before launching new learning programmes (34, 35). Understanding the limits helps to redefine the kind of learning which is vital at this time and for which the support of international documentation systems is required.

3.1 Quantitative limit: Just as no individual can absorb all information, so it is not feasible for any group to do so even by sharing the load amongst its members. In fact it is only practical to devote a limited proportion of time and resources to absorbing or disseminating information. Furthermore much is destroyed after a certain period (***). In an important sense we live in a forgetting society. Much information quickly becomes irrelevant, especially in rapidly evolving disciplines (****).

« In speculating about the evolution of memory, it is helpful to consider what would happen if memories failed to fade. Forgetting clearly aids orientation in time: since old memories weaken and the new tend to be vivid, clues are provided for inferring duration. Without forgetting, adaptive ability would suffer: for example, learned behaviour that might have been correct a decade ago may no longer be... Thus, forgetting seems to serve the survival of the individual and the species ». (17) Groups, like individuals, can suffer from information overload. There is no way that some countries or institutions can absorb the amount of information considered relevant by their better endowed counterparts. This is an aspect of the problem of transfer of know-how. Such groups are « unlimited » in their capacity to continue to learn, but there is a « limit » on the rate at which they can do so. Another fruitful aspect of this question emerges from comparison of the rate of increase in knowledge production with the rate of increase in population. Each advance in knowledge increases

(*) It may be argued that these focus on the learner's limited relationship to the body of knowledge, whereas the learner is unlimited (except by death) in his ability to continue to engage in the learning process i.e. however, slowly he learns or re-learns, he can always learn something more.

(**) Presumably the slogan does not simply refer to the trivial notion that society can always learn something more.

(***) Multinational enterprise deliberately destroys most records after several years, for example.

(****) There have been complaints that the original observes (facts) on which most scientific papers are based are destroyed.

awareness of what remains unknown (*) but, perhaps more significantly, each « unit of knowledge » produced becomes increasingly difficult to disseminate through the learning process, because of the increasing « competition » (for attention time) from other units to be learnt. Under such conditions each « unit of knowledge » produced can usefully be seen as increasing the *ignorance* of those who are unable to absorb it (for whatever reason). The production of new knowledge for some is therefore matched by the reduction of others into greater ignorance. And the amount of ignorance so « produced » increases much faster than knowledge production because of the effects of population growth. Each (« significant ») document entering the international system increases the ignorance of those who fail to absorb it. The question is when the ratio of ignorance to knowledge in society will be such as to render knowledgeable decision-making unimplementable because of ignorance on the part of those who are needed to support the decision in a democratic process. And given the prevalence of ignorance (and the impossibility of eliminating it) would it not be more creative to investigate it in the hope of discovering properties which would enable it to be viewed and used as a resource (**). For example, given its inherent « boundedness », it could presumably provide insights into the structuring of society into « information cells » of many types, linked by a variety of information networks. Then the question becomes how groups and individuals can learn to benefit from their state of ignorance (**).

3.2 Limit to connectedness : Assuming that the task of societal learning can be shared amongst the appropriate sectors of society, the question is whether these « learning units » can be appropriately connected so that such learning is available to guide decisions of the whole.

If it is assumed that *learning can be effectively projected* into documents then this merely becomes a question of ensuring that the document systems used by the learning units are interconnected. This is a problem of physical connection (e.g. through data networks) and of the logical and functional connection among the documents and their contents. Considerable progress is being made on this front. But it is fairly evident that this is a long way from matching the requirement of collective learning - even, and especially, in the case of the intergovernmental agencies within the U.N. family. And the failure in the latter case indicates the presence of a definite limit which should be borne in mind. If, however, it is assumed that *learning cannot be projected into documents* (but is only usable or « activated » once it has been effectively « absorbed » by one or more individuals), then the problem becomes one of ensuring that such « primed » individuals (or groups) are appropriately interconnected, possibly backed up by documentary information stored in data bases. Here again progress is being made through the rapid emergence of computer conferencing systems (7, 36, 37). Yet despite their success, these systems merely serve to clarify the presence of a limit in the ability to establish functional connections between knowledge units (12, 38) and between those so connected (39). In addition such systems are, even more so than the telephone, only available to the privileged. However much they spread in industrialized countries, access to them in developing countries will be very limited. If it is argued that such a degree of on-line interconnectiveness is not a necessity for all, there is a dynamic discontinuity with those who can only be contacted by post (or unilaterally via the mass media). This « disconnection » is perceived as a serious gap by those on

each side of it and immediately affects the dynamism of the learning process and of its use.

3.3 Limit to collective comprehension span : Again assuming that the task of societal learning can be shared amongst the « appropriately connected » sectors of society, the question is whether the span of collective comprehension of whatever group is empowered to act on such learning corresponds to the range of elements relevant to the act. As in the case of the individual, there is a limit to the number of domains of knowledge (however « pre-digested ») which a group can handle conceptually as a comprehensible whole. Most groups have developed, whether consciously or unconsciously, remarkable skills at « sweeping awkward factors under any convenient conceptual carpet » in order to create the impression that they are in control of a situation. Presumably society could reach a condition in which more inconvenient items of knowledge are being repressed in this way than are effectively dealt with. As noted earlier, the Club of Rome report stresses the complete inadequacy of current integrative skills. Why is this ? What are the obstacles to conceptual integration ? Only by facing up to the nature of this limit can information systems be designed which compensate for the effects of the « repressive instinct ». One aspect of this design problem is the total dedication of information systems to the presentation to the user-learner of information structured linearly (e.g. agenda items). Comprehension of complex domains demands non-linear presentation of information (15) (*). This may include structured images, although the Club of Rome report strongly advocates the use of images in general :

« No less important as an element of learning, images have been under-emphasized by societies and sciences bent on rational speculations and inferences deriving from operational laws... But we cannot underestimate the advantages images have for global perception and instant access... That is images generate operations at the core of our intelligence by which we produce a general proposition on the basis of a limited number of particular ones. Images also generate insight... The fact that collective images exist - and that perceptions can be shared - links societal to individual learning. It is the down-playing of images in maintenance learning that tends to blur these interconnections ». (5, pp. 41-42) (**).

The considerable intellectual and financial investment in the hardware and software of non-image oriented information systems makes it unlikely that any useful link to image manipulating systems (including map-generating devices (15)) can be established. Parallel systems may well be developed which fragment what should be an integrated approach. (Note how the photographic libraries are totally separated conceptually from the « more serious » documentary information systems of international agencies). The situation is aggravated by a related limit (discussed below) governing biases against different forms of information. Another aspect of the design problem is that it is now recognized as misguided to elaborate information systems independently from the groups and institutions that they must serve. The man/machine interface has become such a critical factor that it is now vital to consider « groupware » design as a necessary complement to hardware and software design. Group comprehension of complex problems may well require that a user group « reconfigure » to grasp the pattern of information available (12, 38). Information systems should facilitate this process but as yet no such flexibility is envisaged. The gravity of the situation is particularly evident in the difficulty large conferences experience in organizing themselves as groups marshalling the (documentary) information at their disposal to focus on problem complexes (40).

3.4 Limit to depth of collective comprehension : There are two conventional responses to the previous limit. At one extreme is the effort to achieve an « overview » of a problem situation by sacrificing any focus on detail. At the other extreme is the much favoured

(*) « Compared to the pond of knowledge, our ignorance remains Atlantic. Indeed the horizon of the unknown recedes as we approach it ». (The Encyclopaedia of Ignorance. New York, 1977, p. IX).

« For example, when one acquires a bit of new information, there are many new questions that are generated by it and each new piece of information breeds five or ten new questions. The questions pile up at a much faster rate than does the accumulated information. The more one knows, therefore, the greater his level of ignorance » (Itzhak Bertov. *Stalking the Wild Pendulum*, New York, 1977, p. 1)

(**) « If all knowledge were within a man, and ignorance were wholly absent, the man would be consumed and cease to be. So ignorance is desirable, inasmuch as by that means he continues to exist... » (Jalaluddin Rumi. Discourses).
 (***) «... and at once it struck me what quality went to form a Man of Achievement, especially in Literature, and which Shakespeare possessed so enormously - I mean negative Capability, that is, when a man is capable of being in uncertainties, mystery doubts, without any irritable reaching after fact and reason... (John Keats. *Letters*, 21 December 1817).

« The aim of the article has been to show that our most successful theories in physics are those that explicitly leave room for the unknown, while confining this room sufficiently to make the theory empirically disprovable » (Otto Frisch).

(*) Consider the relative value, as a decision tool, of a first of knowledge are being repressed in this way than are effectively dealt with. As noted earlier, the Club of Rome report stresses the complete inadequacy of current integrative skills. Why is this ? What are the obstacles to conceptual integration ? Only by facing up to the nature of this limit can information systems be designed which compensate for the effects of the « repressive instinct ».

(**) It is appropriate to note that within the United Nations University's Human and Social Development Programme there is a sub-project on alternative « forms of presentation - to conventional text.

tendency to concentrate on some highly specific « practical » question, ignoring the context, in order to make « concrete progress » and « achieve results ». Information systems have not yet been designed to stabilize the shift of groupware focus between these different levels – even though they supposedly correspond to the hierarchy of subject categories by which documents are organized. As in the case of the individual, it is difficult for a group focusing on a given level to bear in mind more than the next broader level and the next narrower level. Where there are many relevant levels, much must remain out of focus. And in the dynamics of practical programmes and policy-making, levels acquire an independence from one another especially since they lend themselves to the establishment of groupware fiefdoms. These may well give rise to their own information systems by which that independence is justified and reinforced. Needless to say such divisions constitute a severe limit on innovative learning.

A slightly different emphasis may be given to the term « depth », namely that associated with the largely neglected concept of « maturity » or « wisdom ». It is not at all clear what restricts the manifestation of collective wisdom. It is however very clear that its manifestation is very limited. The question is whether information systems can be designed and used to enhance such manifestation, respecting the limits to comprehension inherent in wisdom of different depth (12).

3.5 Pre-logical limitations: It is a convenient myth that international document systems are designed to serve a *rational* decision-making process. For example Harold Lasswell makes the point : *Why do we put so much emphasis on audio-visual means of portraying goal, trend, condition, projection, and alternative ? Partly because so many valuable participants in decision-making have dramatizing imaginations. They are not enamoured of numbers or of analytic abstractions. They are at their best in deliberations that encourage contextuality by a varied repertory of means, and where an immediate sense of time, space and figure is retained* ». (41)

This stress on dramatization is, however, probably only an indication of the « tip of the iceberg ». On the one hand, many use items from the international documentation system to support pre-logical positions which are completely undermined by other documents which are not cited, even if they have been consulted). This is part of the « drama » of the political arena and is accepted as such. Many are responsive only to the immediacy of verbal presentations, or to « scientifically-backed » arguments, or to arguments of a delegation with a strong power-base. Others are affected, or unaffected, by the style of presentation, whether it stresses order/disorder, static/dynamic, continuity/discreteness, spontaneity/process, etc. (11).

On the other hand, and more important, many (at every level of education) are totally indifferent to the whole process which the international documentation system is designed to serve. For them, those documents contain no meaningful information (**). It is they who are totally unaffected by efforts to « generate a political will to change <> through the « mobilization of public opinion » (51) . No wonder that the UN Secretary General remarks : *« It would probably be unfair to conclude that a sudden callousness had overcome public opinion in the developed countries. It is mors like a closing of the gates to a pattern of generalizations perceived as out-worn by overuse »* (529 (**).

Although little is known about this pre-logical limit as it affects information, the receptivity to some forms of information only means that there is a limit to the extent to which an individual or group can learn from information in other styles and modes. It is not simply a question of « multi-media presentations » but of the pre-logical questions inherent in any given form of information. The question is how these orientations *complement* one another and what this limit implies for information systems designed for communication of insights between users of every orientation.

(*) A major group is that for whom the international community is defined by the stars of popular music and song. And yet, perhaps ironically, it is their preference for rhythm, melody and harmony which provides valuable clues to a less - monotonous -

approach to alternative futures for the world.

(14).

(**) Perhaps the concept of an « information diet » is relevant. Individuals and groups

do not flourish on information of one type only. A « balanced » diet is required. This could also apply to users of an international documentation (?) system. The usefulness of such analogies is illustrated by one relevant to the assimilation of information which is used in the Club of Rome report : « Values can be said to be the enzymes of any innovative learning process ».

3.6 Collective attention span limit : It is a well-know characteristic of any society that it is unable to focus its collective attention on any situation for any length of time. Even the most dramatic events tend to be only « nine-day wonders » before falling into oblivion. Clearly « nine-days » is more characteristic of attention focused through the mass media. But « issues » brought to the attention of international conferences may only remain active for a period of weeks or months - although « hot » issues, providing ammunition in a dramatic debate may even be expended within a period of hours. Of perhaps greater significance are issues that survive the government election cycle (e.g. 4 years) and are given a permanent focal point through institutionalization - possibly with the creation of special documents and a specialized information system. A special difficulty for the international documentation system in this context (and, subsequently, for users) is the period over which a category is forced (for a period) to carry the significance of concepts already abandoned, then later becomes denatured, and finally « wears out » ().

This process is well-illustrated by Johan Galtung's disillusioned analysis of « concept careers » within the UN system, meaning both how concepts undergo a career of stages or phases, a life-cycle in other words, and how concepts may move from one organization to another. Thus, as to the life-cycle aspect : *- A fresh concept is co-opted into the system from the outside (almost never from the inside because the inside is not creative enough for the reasons mentioned). The concept is broad, unspecified, full of promises because of its (as yet) virgin character, capable of instilling some enthusiasm in people who do not suffer too much from a feeling of déjà-vu having been through a number of concept life cycles already. Examples : basic needs, self-reliance, new international economic order, appropriate technology, health for all, community participation, primary health care, inner/outer limits, common heritage of mankind (**).*

- The organization receives the concept and it is built into preambles of resolutions; drafters and secretaries get dexterity in handling it. The demand then arises to make it more precise so that it can reappear in the operational part of a resolution. A number of studies are commissioned, very carefully avoiding too close contact with people and groups behind the more original formulations as « they do not need to be convinced ».

- The concept thus moves from birth via adolescence to maturity, meaning that it has been changed sufficiently to become structure and culture compatible (it will not threaten states except states singled out by the majority to be threatened); the idiom will be that of the saxonian intellectual style, rich in documentation and poor in theory and insight; very precise but limited in connotations and emotive overtones; « politically adequate » meaning that it can be used to build consensus or dissent, depending on what is wanted where and when.

- From maturity to senescence and death is but a short step : the concept thus emancipated can no longer serve the purpose of renewal as what was new has largely been taken away and what was old has been added in its place - except, possibly, the term itself. Even the word will then, after a period of grace, tend to disappear, those who believe in it now no longer identify with it; those who did not get tired of saying « we knew it would not work, it did not stand the test of reality » . In this phase outside originators of the concept may be called in for last ditch efforts of resuscitation, usually in vain. There is no official funeral ceremony as the concept will linger on in some resolutions, but there will be a feeling of a void, of bereavement. Consequently, the search will be on, by concept scouts, for new concepts to kindle frustrated and sluggish consciences. And as a result -
- a fresh concept is co-opted into the system from the outside, e.g. one that has already been through its life cycle in another part of the UN system. For the rest read the story once more.

Nevertheless, each concept leaves some trace behind, more than its denigrators would like to believe, less than the protagonists might have hoped for. If this were not the case the cognitive framework for the system would have undergone no change during the 35 years of its existence». (53)

The special feature of this limit is its *dynamic* nature. In one sense it is perhaps to be deplored that collective attention cannot be focused

(*) Perhaps it is appropriate to consider the « half-life » of « active » concepts, by analogy with that of radio-active elements.

(**) In view of Unesco's favourable response to the Club of Rome report, presumably « learning » is now launched upon its career.

cused long enough to give rise to effective action (40). But in another sense attention shifts onto the issue no longer serves the poorly understood needs for dynamism within the international community (issues are « consumed » to fuel the dynamics). And, to the extent that the attention shift takes place in search of innovative renewal, this is to be welcomed – particularly since this brings alternative and complementary factors into focus. But, given these extremes, not enough is known to indicate when a shift is premature (in terms of action requirements) and when it is necessary (in terms of the healthy dynamics of world society). Clearly a complex world *problématique* demands both sustained attention to comprehend the dimension of the problem and shifts in attention to respond to complementary needs.

A more subtle constraint associated with attention lies in the assumption that the process of attention can be completely « insulated » – from the matter to which the attention is directed. This convenient distinction between observer and observed, traditional to the classification sciences, is now shown to be questionable even within that discipline (56, 57). Not only is attention time limited but the process can (and possibly should in a learning situation) change the observer and what is observed, in this sense learning does not result in conceptually « grasping » some fixed « thing », but rather in an elusive, evolving conceptual « dance » in which both partners are modified by the process. The very lack of limitation limits the social relevance of such learning. Clearly the international information systems should have a major role to play in focusing collective attention, maintaining that focus and shifting without hiatus to alternative issues – recognizing of course that many alternative issues must be focused upon simultaneously, in the light of the previous limits (*), and that the different attention spans of users must be appropriately catered for and somehow « phased » together. In this sense the problem may be defined as the « management » of humanity's most valuable resource, namely attention-time, especially collective focused attention-time (**).

3.7 Collective memory limit : In an earlier section some clues to the nature of collective memory were explored. It is clear that there has been very little study of this. As a device to stimulate further discussion of the matter, this section will make use of studies of individual memory by assuming that there is some degree of equivalence between individual and societal memory. In the study of individual memory much has been learnt from its malfunctioning. Is there not a striking parallel between the many attempts by the UN Secretary General to communicate to world society the urgency of our present situation and the following fictional account of an analogous situation with an individual ? « To say that he understood what went on was true. To say that he did not understand – was true. I would sit and explain, over and over again. He listened, his eyes fixed on my face, his lips moving as he repeated to himself what I was saying. He would nod : yes, he had grasped it. But a few minutes later, when I might be saying something of the same kind, he was uncomfortable, threatened. Why was I saying that ? and that? His troubled eyes asked of my face : What did I mean ? His questions at such moments were as if I had never taught him anything at all. He was like one drugged or in shock. Yet it seemed that he did absorb information for sometimes he would talk as if from a basis of shared knowledge : it was as if a pan of him knew and remembered all I told him, but other parts had not heard a word. I have never before or since had so strongly that experience of being with a person and knowing that all the time there was certainly a pan of that person in contact with you, something real and alive and listening – and yet most of the time what one said did not reach that silent and invisible being, and what he said was not often said by the real part of him. It was as if someone stood there bound and gagged while an inferior impersonator spoke for him ». (Doris Lessing, *Re : Colonised Planet 5 - Shikasta*, London, 1979, pp. 56-57).

The collective inadequacy of society in the face of information on the world *problématique* suggests that such aberrations should be reviewed carefully.

Collective memory would seem to be exposed to processes leading to its very rapid erosion. Psychiatrist Ronald Laing has given an account which can be interpreted as dramatizing the problem of institutional and inter-institutional learning (see on next page). These quotations suggest that understanding the present constraints on societal learning could benefit from a systematic review of the pathology of individual memory. Some pointers are given on the following page.

The paragraphs above focus on memory as that which is actively shared in collective consciousness. This was shown to be an elusive phenomenon. The alternative (as before) is to focus on the international information systems on which such collective consciousness is supposedly based (5). Their most striking feature is their fragmentation, whether as systems almost completely independent of each other, or individually in their isolation of subject categories from each other.

As to the first, there are of course many initiatives to interlink such systems via data networks. But for each such initiative successfully achieved, many new specialized independent information systems are created. A distinction must also be made between linkages between such systems (presumably resolving the fragmentation problem for the user), and linkages to such systems from a given user via data networks (which relegate to the user the problem of resolving the fragmentation). In his own review Toffler (6) in discussing the « intelligent environment » makes it clear that the era of the large central computer is largely past. Society is now faced with the « distribution » or de-centralization of computing power to the point that individual offices in an agency could well develop and maintain local memory which they may share with other parts of the organization or of the system to which it belongs. In the face of the widespread spectre of « Big Brother », manipulation of information systems, it is unlikely that much effort will be made to facilitate such sharing beyond a certain point. This will severely limit collective learning ability.

As to the second, there are of course many attempts to improve and standardize the classification of subjects. But the more fundamental problem is that any such classification scheme is imposed as a relatively rigid logical abstraction on a dynamic subject continuum. The limiting assumption of the observer/observed distinction (56, 57) has already been discussed. But there remains a tremendous functional gap between the logical subject hierarchies and the network of operational realities.

It is as though society depended upon subject categories organized in memory in a manner analogous to the rigid protocol of 16th century battle order when the *problématique* demands a flexible organization of memory corresponding to the shifting patterns of modern guerrilla warfare and changing alliances (*). It may be that the incompatible demands of « hierarchical » and « network » memory organization cannot be met within present information systems and that this limitation calls for a paradoxical shift in perspective (59).

Another limiting factor in collective memory is the widespread practice of restricting or "classifying" documents as « secret ». Information is treated in this way when it is assessed as having the potential to trigger change which the possessor of the information wishes to control, prevent, or use to his advantage. The possibility that some military or industrial classified information might lead to widespread benefits if released need not be discussed here (5, p. 54). Much more serious is restriction of information (« liable to cause public panic ») concerning the world *problématique* or institutional incapacity when it is only such information that can provoke rapid innovative societal learning and galvanize « the political will to change ». In such a context, no one can prove that there is *not*, for example, solid classified evidence for any number of present and future phenomena which would put the world *problématique* in a totally different light. It is merely a frail *assumption* that

(*) Environmental information provides an admirable example. Plant and animal species

(*) Use of the term « focus » suggest the possible value of investigating optical systems as providing useful analogies to describe the problems and possibilities (see 40).

(**) It would be a useful exercise to develop a theory of societal development and control in terms of « attention absorption ».

are interrelated in food webs (networks). There is considerable controversy about

the « logic » of the systematic (hierarchical) grouping into species although these are used as categories in formal ion systems. Pollutants travel through food webs to points which society chooses to perceive as « problems » and only as problems may the species be included in the systems. But the information systems are organized in terms of the « logical » categories of pollutants and species (it both are in the same system) without any attempt to record the food webs via which the categories are linked in ecosystems and through which a continuing pattern of problems with emerge. (Point made by the author at the UNEP 2nd Infoterra Network Management Meeting, Moscow, 1979).

open information systems supply documents of more than trivial significance (For a discussion of related questions, see Sissela Bok, *Secrets*, on the ethics of concealment and revelation. New York, Pantheon, 1982). In the case of an individual, this problem of hidden pockets of information « charged with significance » is of course well-known to psychoanalysts. Perhaps, however, the ultimate limit to societal learning lies in the consequences of unrestricted societal over-commitment to learning. As enthusiastically described by Unesco (33) and the Club of Rome (5), learning is not limited by its relationship to other social pressures. The Club of Rome does not correct this irresponsible interpretation of the significance of « No Limits to Learning » when the French version of its report appears under the title . On ne finit pas d'apprendre » (Pergamon, 1980) - a nuance which was apparently carefully discussed. As an extreme example, this leads via the « eternal student » to a society dedicated to the consumption of information and totally unable to focus that learning for action (on the world problematic, for example). This raises the question as to what extent information systems do, or should, empower users to act.

4. Future approaches to collective memory

4.1 Patterns of subjects : It is ironic, in the light of the word-list orientation of the previous section that investigations of individual memory in the 1950s and 1960s focused almost exclusively on the recall of word lists. « At present, we have reached the point where lists of sentences are being substituted for word lists in studies of recall and recognition. Hopefully this will not be the end-point of this development, and we shall soon see psychologists handle effectively the problems posed by the analysis of connected texts ». (60, p. 2). But the same author continues :

« Most of the experimental research on memory has never really dealt with problems of the acquisition and retention of knowledge, but with episodic memory (storage of experiences) which is not at all the prob-

lem of interest in education. Simply replacing the words with sentences in our experiment will make the research no more relevant to education than it was before... In contrast to short-term memory, there are only a few reasonably formal and specific models of organization and long-term memory processes... The experimental study of memory for prose, comprehension, inferential processes, and semantic memory is just beginning. Thus, memory theorists have shown an unfortunate tendency to rely solely on list-learning data, to neglect other problems, and finally to construct not models of memory but models of memory for word lists ». (60, pp. 4, 74 and 79).

Is this not the problem with current storage and retrieval systems ? What are needed for learning are patterns of subject information, not lists.

« It is one of the most salient facts about memory that organized material is easier to remember than unorganized material, and that subjects actively strive to detect how to-be-learned material is organized, and impose their own subjective organization if no other can be found... Storage organization, and retrieval processes in memory all involve the operation of pattern completion ». (60, pp. 74 and 83). Furthermore, new learning presupposes the availability of such patterns in memory to which the new information can be connected. Learning does not consist in the passive recording of new information (60, p. 4). Moreover, these patterns may be made up of generative rules rather than simple concepts. « When one talks about the structure of memory, one tends to think about it as something given, something fixed, erected inside the brain in all its complexity, like a Gothic cathedral sitting in a town square. Alternatively, one may think of structure not as something existing physically but as a potential to be generated upon demand on the basis of implicit information and according to certain rules ». (60, p. 23)

4.2 Modeling the international documentation system: Despite its greater visibility, it may well be asked whether there exists any adequate model of the international documentation system with all its various subsystems. If not, why not ? Surely this is a valuable

COLLECTIVE MEMORY

PERSONIFIED: AN ANALOGY

The description below seems to provide a perfect, if tragic, summary of the condition of world society - particularly in terms of the condition of collective memory. It is in fact Ronald Laing's description of a patient suffering from chronic schizophrenia. Readers can replace « Julie » in the text by « world society », « public opinion » or « international community » bearing in mind their relationship to collective memory.

« Even when one felt that what was being said was an expression of someone, the fragment of a self behind the words or actions was not Julie. There might be someone addressing us, but in listening to a schizophrenic, it is very difficult to know « who » is talking, and it is just as difficult to know « whom » one is addressing... One may begin to recognize patches of speech, or fragments of behaviour cropping up at different times, which seem to belong together by reason of similarities of the intonation, the vocabulary, syntax, the preoccupations in the utterance or to cohere as behaviour by reason of certain stereotyped gestures or mannerisms. It seemed therefore that one was in the presence of various fragments, or incomplete elements, of different « personalities » in operation at the one time...

With Julie it was not difficult to carry on a verbal exchange of a kind, but without her seeming to have any overall unity but rather a constellation of quasi-autonomous partial systems, it was difficult to speak to « her ». However... even this state of near chaotic nonentity was by no means irreversible and fixed in its disintegration. She would sometimes marvellously come together again and display a most pathetic realization of her plight But she was terrified of these moments of integration, for various reasons. Among others, because she had to sustain in them intense anxiety; and because the process of disintegration appeared to be remembered and dreaded as an experience so awful that there was refuge for her in her unintegration, unrealness, and deadness. Julie's being as a chronic schizophrenic was thus characterized by lack of unity and by division into what might variously be called partial « assemblies », complexes, partial systems, or « internal objects ». Each of these partial systems had recognizable features and distinctive ways of its own. By following through these postulates, many features of her behaviour become explicable.

The fact that her self-being was not assembled in an allover manner, but was split into various partial assemblies or systems, allows us to understand that various functions which presuppose the

achievement of personal unity or at least a high degree of personal unity could not be present in her, as indeed they were not. Personal unity is a prerequisite of reflective awareness, that is, the ability to be aware of one's self acting relatively unself-consciously, or with a simple primary non-reflective awareness. In Julie, each partial system could be aware of objects, but a system might not be aware of the processes going on in another system which was split off from it. For example, if in talking to me, one system was « speaking », there seemed to be no overall unity within her whereby « she » as a unified person could be aware of what this system was saying or doing.

In so far as reflective awareness was absent, « memory », for which reflective awareness would seem to be prerequisite, was very patchy... The absence of a total experience of her being as a whole meant that she lacked the unified experience on which to base a clear idea of the « boundary » of her being. Such an overall « boundary » was not, however, entirely lacking... Rather, each system seemed to have a boundary of its own. That is to say, to the awareness that characterized one system, another system was liable to appear outside itself... It was only « from the outside » that one could see that different conflicting systems of her being were active at the same time. Each partial system seemed to have within it its own focus of centre of awareness: it had its own very limited memory schemata and limited ways of structuring percepts; its own quasi-autonomous drives or component drives: its own tendency to preserve its autonomy, and special dangers which threatened its autonomy. She would refer to these diverse aspects as « he », or « she », or address them as « you ». That is, instead of having a reflective awareness of those aspects of herself, « she » would perceive the operation of a partial system as though it was not « her », but belonged outside. She would be hallucinated ».

(R.D. Laing, *The Divided Self*, a study of sanity and madness. London, Tavistock, 1960, p. 214-7).

As a first step towards clarifying the range of defects to which collective memory may be vulnerable, it is appropriate to consider those of individual memory. In each case below these are described in such a way as to point to the nature of the possible equivalent in the case of collective memory. The order is not significant.

(a) Transient global amnesia :

This consists of an abrupt loss of memory, lasting from a few seconds to several hours, without any loss of consciousness. No information is stored for that period and thus there is complete loss of memory. Such attacks may be recurrent and are thought to result from temporary reductions in blood supply to specific areas of the brain (possibly presaging a stroke). Actions may continue to be performed automatically during the attack (traumatic automatism).

Analogous phenomena may occur in the case of collective memory.

(b) Traumatic amnesia :

Following recovery of consciousness after cerebral trauma caused by a head injury a person is typically dazed, confused, and imperfectly aware of his whereabouts and circumstances. During this state it is not possible to store new memories. On recovery the person may be unable to recall this period (post-traumatic amnesia) and may exhibit memory failure concerning brief or long periods into the past (retrograde amnesia). Subsequently memories may gradually return and be interrelated in an appropriate time sequence.

Analogous phenomena may occur in the case of collective memory as a result of natural disaster or major social upheaval (war, revolution, etc), or as a result of damage to some particular repository of collective memory.

(c) Retrograde amnesia :

This consists of loss of memory for events that occurred at a time when brain function was unimpaired. It is therefore generally due to failure of retrieval although this is usually very selective - « islands » of memory in a « sea » of amnesia often emerge.

An analogous phenomenon may be encountered in collective memory. For example particular incidents may be recalled, and reflected in various repositories, although there is loss of memory concerning the processes which connected them together and with the present.

(d) Hysterical amnesia :

One form of this involves failure to recall particular past events, possible in a particular period. In another form there is failure to register current events and subsequently to recollect them. In both cases the memories may influence behaviour although they resist efforts at recollection. Such memories are usually painful and are repressed as a psychological defence. (It is characteristic that they may be recovered under hypnosis). Analogous phenomena may occur in the case of collective memory. In bureaucratic environments they are associated with the process of « burying » some unpleasant file of information, if only by severely restricting its distribution. Or alternatively it will be carefully arranged that no file is created in the first place. The media and politicians often act on the assumption that the public will « forget » some unpleasant item of information

(e) Alternating amnesia :

In this condition two separate states of consciousness alternate with one another, during each of which there is no memory for events that occurred during the other. Each state is a complex set of memories, attitudes and behaviours with distinctive characteristics, and is sequentially and disjointedly manifested. (This is a form of hysterical amnesia). Analogous phenomena may occur with collective memory, segments of which may be activated and expressed sequentially but without reference to each other. One possible indication of this is when a body of individuals convene in one mode and subsequently reconvene in another mode « wearing different hats » in which it is « inappropriate » to make any reference to the previous occasion

(f) Hypnotic amnesia :

Amnesia may be induced by the use of suggestion usually under hypnosis (in a trance state). Memory of the trance state is vague and fragmentary, especially if the suggestion is that it should be forgotten.

Analogous phenomena may be found with collective memory. Public opinion may be « hypnotized » by suitable processes (perhaps fascist propaganda is an extreme example) and these may well cause awareness of the « hypnotized state » to be collectively repressed.

(g) Aphasias:

These impairments of the formal language code in verbal communication are due to circumscribed cerebral lesions. They may be grouped as follows :

- (1) Disorders of spoken language.
- (2) Disorders of written language, including the reproduction of graphemes.
- (3) Disorders of reading include general disintegration of the sense of word structure.

In the case of collective memory, there may be analogous disturbances in decoding and encoding between the various modes. In the operations of the international community there are many instances of systematic weaknesses in spoken communication, and inability to « read » available texts with any efficacy. There is often a hiatus between the two modes.

(h) Paramnesia and confabulation :

These are errors and illusions in memory and their reproduction. They may consist of : treatment of fantasies as genuine events, belief that events similar to a unique event have previously occurred (reduplication of memory), or belief that an event identical to a previous event has previously occurred (*déjà vu*). Whilst all remembering depends heavily on reconstruction rather than on mere reproduction alone, confabulation is a highly error prone form of production of spurious memories and fabrications.

Analogous phenomena may be found with collective memory particularly in some of the abuses of speech-makers and the media whereby facts are « invented » which appear to fit the context of a presentation. These processes may also be associated with the important phenomena of rumour in establishing public opinion.

(i) Korsakoff's syndrome :

This is a complex syndrome defined by four possible conditions :

- gross defect in recent memory (associated with retrograde amnesia) although memory for remote events and didactically learned facts remains intact
- a spatial or temporal disorientation
- some degree of confabulation
- false recognition.

It occurs in a wide variety of toxic and infectious brain illnesses as well as in association with some nutritional disorders.

The syndrome may be so severe as to produce « moment-to-moment » consciousness, with information only being retained for a few seconds and providing no continuity between one experience and the next. Learning may thus be severely limited or impossible. The condition can be transitory or chronic.

Analogous phenomena may occur in the case of collective memory in social conditions of extreme deprivation or disorganization.

(j) Memory defects of special origin :

Memory disorders usually result following brain surgery, encephalitis (brain inflammation) or electroconvulsive therapy. Those of the first case may well resemble those of the second which themselves resemble those of Korsakoff's syndrome. However the individual in both cases recognizes the memory difficulty. Frequent electroconvulsion sometime leads to exaggerated forgetfulness for day-to-day events. Analogous phenomena may occur in the case of collective memory as a result of physical destruction of portions of an information system, uncontrolled hyperdevelopment of such a system, or the subjection of such a system to frequent overload beyond the breakdown threshold.

way to investigate user-learner problems. It should be much easier to simulate than individual memory (as is done in artificial intelligence investigations). As a useful guide Nico Fridja has listed the structural properties which must eventually be incorporated in a model of memory. Such a model must (minimally) encompass the coding of single items (cognitive units), classes, relations (inferences, functions), higher order systems. In addition, any adequate model must deal with methods for transferring data, assimilating new information into the data base and deriving implications which influence future action. But, as Fridja concludes :

- (I) is one thing to give a formal representation of this complexity, and quite another to envisage learning processes that construct the necessary categories as well as the specific structures. It seems to us that the study of learning processes which can account for knowledge acquisition, has hardly begun ». (61, p. 159)

The current literature on individual memory postulates a rich array of storage systems: temporary way stations along the route taken by information in the process of assimilation. Memory overlaps with perceptual and decision processes not as a unitary system but as a synthesis of diverse cognitive activity. The explanatory progression has been away from registration of experience etched upon a suitably receptive surface towards a selective process in which information is encoded, stored and retrieved following the operation of processing strategies which may vary with both task and material requirements. (62, p. XIII).

« The end product can be described by a directed graph whose organization reflects the organization of the information in the user. What we would like to do is find experimental procedures which will readily reveal at least the major part of these structures ». (63, p. 91)

The author then indicates the classification problem which is highly relevant to use of international documentation systems with rigid classifications:

« Another problem is that the internal scheme of organization is likely to be different for different groups of people. Thus, in a hospital, nurses will be likely to classify patients with tonsillitis and appendicitis together in contrast to throat cancer and prostate operations since the former need little nursing and the latter pair more intensive nursing. For medical staff, on the other hand, it would be more natural to classify the tonsillectomy and the throat cancer patients together and the prostate and appendix patients together on the basis of the parts of the body concerned ». (63, p. 91)

4.3 Associative networks : More generally this suggests a major lack in user sensitivity of international documentation systems using logical category schemes. Some work on individual memory is now focusing on associative or relevance networks (64, p. 108).

« Relevance simply tells us « what goes with what ». This aspect of belongingness is to be found both in the world itself, in the sense of causal, spatial and temporal connections and structure, and also in the representation of the world in our minds, commonly referred to as our « knowledge of the world ». The author maintains the view that one very important aspect of this knowledge of the world is simply knowing these « what goes with what » connections. This kind of knowledge is clearly not all that we need. In addition to knowing that chair goes with table we also need to know a great deal of information about the relational (logical) nature of the connection. Considering, however, the extremely large amount of relational information that we all carry around with us in our memory, efficient retrieval of parts of this information demands that we should have the means for quick, global evaluation of what alternative possibilities need to be considered in a situation... My interpretation of word associations is that they are direct indicators of degrees of relevance between the concepts for which the words are labels through their word senses ». (64, p. 108).

Such associative networks, crossing conventional categories, could highlight and facilitate possibilities for the integrative approaches recommended by the Club of Rome report.

« Word association norms, and particularly the associative Thesaurus network, are thus fairly direct mappings of this aspect of structure of the organization in our minds. Not only do they tell us what the elements are which we need to think about in contiguity with each other, but they also indicate the degree of cohesion existing between them. The detailed study of this kind of organization is what the Associative Thesaurus makes possible for the first time on a large scale ». (64, p. 108-109).

Such networks as data bases also permit a whole new range of analyses of value to the user. This was a determining factor, for ex-

ample, in the organization of the experimental Yearbook of *World Problems and Human Potential* (2), now being revised. Although the production of relevance maps would be a major aid to international document users (15), the challenging requirements for comprehension and innovative learning already make such an advance inadequate. The problem is that such maps are too complex and disorganized to facilitate contextual memorability and comprehension, as opposed to *detailed consultation* (*). As noted before, this is the price of moving away from a conventional hierarchical scheme of categories, whatever its disadvantages. 4.4 Packing complex patterns of information : The problem is how to « pack » complex patterns of information in order to facilitate representation, communication and comprehension whilst retaining contextual memorability (10). Certain encoding schemes - the use of imagery, the method of loci, and the mnemonic pegword system are only the most familiar examples - have long been employed by mnemonists to assure the memorability of events (65). But it is not the curious abilities of memory prodigies that are of interest, rather it is the severe *memory challenge* to users posed by the world problematic. The optimistic proponents of total « fingertip » access are quick to relegate all memory problems to any computerized information system. This could ultimately imply a user defined as a « memory-less decider » between computer supplied options, namely a human « switching device » without any sense of context. This is totally inadequate for innovative learning. As argued elsewhere (10, 13), new approaches are required. It is interesting that these make use of structured images, linking to the strong case made for images by the Club of Rome report (5, pp. 37-42) for different reasons.

« Recent studies of imagery have firmly established the fact that imagery variables are highly effective in a variety of memory tasks. Indeed, they are the most potent mnemonic variables ever discovered... The information in images appears to be structured and integrated in a figurative, spatial or synchronous manner so that the components of the image are simultaneously available for retrieval... The verbal system, however, organizes information sequentially, that is, it concatenates discrete linguistic units into higher-order sequential structures... But none of the available information satisfactorily explains why image-mediated memories often seem to be more resistant to forgetting than « pure » verbal memories... » (66, pp. 57, 77, 81).

How then can information systems augment their value to users by using « structured imagery » ? The difficulty is that the provision of imagery is seen as the intellectually disreputable task of the public information divisions of international agencies. As such the images have an extremely distorted « glossy » relationship to « soberly ordered » documents. This gap should be bridged if documented issues are to become memorable and if public information imagery is to have more than a superficial impact. Hence the use of the term « structured images » which should combine visual appeal with usable information content intimately related to information system concept schemes. Much remains to be investigated in this area (10, 13).

It would however be a mistake to be content with structured images in general. It could be that the really significant breakthroughs in the world problematic will only be possible with the development of *focused* structured images of it (40). Images are too easily lost in the « blip culture » mentioned by Toffler (6). The question is whether new kinds of more powerful image can be developed which can focus and guide user access strategies. Such developments lie at the frontier with the elaboration of a new *symbolism*. It is symbols which as « meta-patterns » provide the most powerful level of integration in relation to the user and thus empower users to act (10). The question is how to find ways of linking the elaboration of operationally significant symbols with the pattern of a user's access strategies to relevant concepts in an information system (67).

4.5 Shared symbols : Ideally what is required - to counteract the fragmentation of collective memory - are shared symbols rather than simply user-specific symbols. The challenge in user terms is to elaborate some symbol which could be the information system analogue to the earth-globe - with equivalent significance for the world community. Such a symbol would orient users in terms of the « functional roundness » of the world problematic rather than the

(*) Again the use of subway maps provides a good example. They can be used but are difficult to memorize as a whole.

present « flat earth » classification of societal functions as subject categories. Whether or not such shared general symbols can be developed to interrelate detailed access maps, users should be able to work in terms of *alternative* user-specific symbols, constrained by their particular horizon and interrelated by the controlled manner in which they can be generated for users from a data base.

It is the web of such alternative symbols, tensed by apparent incompatibilities into the form of an unbounded spherical tensegrity network, which could contain the expanding societal « emptiness » of ever-increasing ignorance (10, 59, 69, 70).

The notion of incompatibilities in a tension relationship is in accordance with points in the Club of Rome report. Thus « it is the tension created by the pressure to select from among multiple values that catalyzes innovative learning » (5, p. 40). But « society... is inherently conflictual and hence global issues are not « resolvable » in some final sense but need to be seen as conflictual » (5, p. 129). Global issues cannot be *resolved* by innovative social learning but perhaps they can be *contained* by some new kind of comprehension structure (13).

5. Implications

A major effort is required to facilitate the cross-category interrelationship of subject areas and to provide users with some tools to augment their ability to tolerate the complexity with which they have to deal.

5.1 Mapping techniques : Librarians have been tricked by the success with which computers have been used to process lists of subjects, bibliographic entries, and lines of text. This provides them with good control of a librarian problems » but does nothing for the user faced with indigestible acquisition lists or on-line keyword search facilities. Innovative learning necessitates new user tools. « Maps » of interconnected topics around a user's focal topic would be of inestimable value in providing him with a sense of context to guide his searches and to signal related topics of concern (15). It should be possible to generate such maps from relatively simple data bases. The hardware exists, as does the software, but none of those concerned have articulated the need sufficiently in order to assemble these elements with the necessary funding. (70).

A major value of such maps would be as a single-sheet background document for agency meetings to provide the context to each agenda item (and, as a result of criticism, to ensure continual updating of the map for that topic) (*). They would be of obvious value as educational aids.

5.2 Interdisciplinarity : As Georges Gusdorf notes in a brilliant essay (74a), « interdisciplinarity » has become a disguise for the mere juxtaposition of disciplines without any significant interaction (**). It has failed to emerge in any significant non-taken form in a society in desperate need of it. The Club of Rome report notes that despite the amount of information published annually it is « incomplete and deficient because it is essentially of an *intradisciplinary* nature with very little emphasis on *inter-disciplinary* materials » (5, p. 109). University « interdisciplinarity » is a mockery torn by interfaculty politics and eroded by cynicism. It has become a joke. The situation is, if anything, even worse in international agencies. Thus it is in the greater detachment of libraries and information systems that hopes must be placed. There, however, even the term is an embarrassment so that books with that dimension are « crammed » into any category including « general » to avoid opening up an inter-category notion (**). There has, for example, never been any study of the problems of classifying interdisciplinary materials, because librarians have not allowed such problems to exist. Users are therefore totally handicapped in gaining the faintest understanding of the many integrative possibilities (see ref. 2, Section K). This leads to general reinforcement of the in-

adequacies of the interdisciplinary approach. A study of this whole matter should be made and the status of material in this area should be reviewed in relation to the « general » category in terms of societal learning needs and the challenge of the world problematique (*).

5.3 Imagery : The Club of Rome report places great stress on imagery ; « images with their integrative power and instant recall, have been underestimated as components of learning » (5, p. 41). Both international agencies and their information systems are committed in many ways to text processing. Only the « public information » programmes use images and these are not considered to be documents of substantive value. A study is required to look into ways to bridge this gap. Users could benefit from images to help them to grasp the nature of the world problematique. It is however, important to avoid superficial approaches to imagery which constitute a trap justifying any preferences for text. What is needed is a way to select a *pattern* of images and to comprehension of a facilitate matching pattern of interconnected problems (possibly represented on a map, as suggested above). It is the possibilities of cross-linking between the patterns that requires study.

5.4 Analogy, metaphor, and parable : The increasing problem of understanding and communicating the nature of the complex conditions in which we are embedded has been frequently stated. This problem is more acute when there is a requirement for rapid and innovative societal learning. Conventional logical explanations have long ceased to suffice. Mathematicians (Thom, catastrophe theory), biologists, religious leaders, and politicians have long been forced to communicate by the use of analogy, metaphor, and parable. This is often true in intergovernmental plenary speeches but rarely in the background documents which are considered to be so indigestible. These forms use verbal imagery to elucidate unfamiliar points and render them memorable. As with imagery (above), there is clearly a need to bridge the chasm separating this meaningful mode with the often meaningless textual mode of documentation. These forms can also be powerful human-centred integrative tools which work even in the most isolated communities. There are few other forms with these qualities. In addition, as noted by the Club of Rome report, they are a stimulus to intuitive thinking (5, p. 126). The question is whether greater benefits could not be derived from these forms if they could be rendered more accessible (and more « apt ») and linked, as an aid to users, to the « problem complexes » about which conventional documents are produced. Documentalists could usefully take the first step by recognizing the urgent need for the construction of such a (right-brain/left-brain) bridge.

5.5 Structured images and symbols : The important distinction between « imagery » (above) and structured images has already been discussed. Structured images are in effect a marriage between imagery and mapping, combining some of the strengths of both. They may also overlap with a range of powerful symbols of integration (10). Both can be powerful tools in communicating and rendering credible the nature of action.

Great efforts are made to develop suitable « symbols » for international programmes. Symbols of this type are often little more than images with little power. The question is whether structured images orienting user access to complex subject domains can be linked to (or blended into) existing powerful symbols capable of galvanizing a « political will to change ». Note the probability of failure of action if the two are not successfully related. Exploration of these possibilities offers a route whereby the currently static concept patterns of information systems can be « activated » into a dynamic catalyst for change.

5.6 Psycho-cultural variants : It is too conveniently assumed that information organization should correspond to approaches elaborated in the developed countries. As recent studies are demonstrating (24), there are other equally meaningful approaches to the organization of concepts which are characteristic of non-indo-european cultures (and by « inaccessible » potential users in indo-european cultures). And even in western countries there is increa-

(*) Ultimately the pressure for (and constraints of) collective comprehension may lead to efforts to map such symbols. Bach on the integrated phenomena of the natural environment from which they have been « extracted » and with which they remain dramatically associated in many cultures whose participation in the societal learning process would be valuable (68).

(**) The data base for the Yearbook of World Problems and Human Potential was created with this possibility in mind. Generation of such maps is planned in connection with the 1985 edition (2).

(***) It is in this sense that Rozsa's (73) positive assessment of the interdisciplinarity of international documentation must be interpreted. Such documents must often be judged as much by the disciplines they exclude as those they include.

(*) The reality of user access problems to such materials, and an indication of the vulnerability of collective memory, is illustrated by an effort in 1975 to consult the General Systems Yearbook (published annually in Washington DC since 1966) at the Library of Congress. Two volumes were available on first request. A protest led to a visit to the stacks where it was clear that several volumes had been misplaced in neighboring racks. The majority had been lost or stolen. (Unesco did not possess the series).

sing criticism of Boolean approaches to data searches. New logics and forms of presentation are called for (56, 57). Any user study must take into account these possibilities. If informational documentation is to be rendered acceptable to those who have not been coopted into developed country traditions. Also relevant is the argument of the Club of Rome report : « In large part, it is the inadequacy of learning capacities which accounts for the low level of understanding not only of ideas and knowledge originating outside a particular culture but also of the values intrinsic to and embodied in technologies that are too often « transferred » inappropriately » (5, p. 89).

5.7 Telecommunications

As noted in the introduction, the features of the information/communication society of the future are emerging. Telecommunications are a vital component. They are basic to the exciting future possibilities of data networks in relation to societal learning. As has been said before such networks are the planetary « nervous system ». The Club of Rome report states, however : « The neglect and abuse of telecommunications is another illustration of how innovative learning is impeded. It is because of the existence of a global communications network... that their neglect is so discouraging » (5, p. 55).

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Of special concern are the little-reported maneuverings of national PTT authorities and commercial data carriers to set the foundations for a totally elitist communication society. The carriers, with the connivance of PTTs, appear to be aiming to create a situation analogous to the well-known « seven sisters » monopoly in the petroleum industry. The PTTs are using spurious arguments to justify heavy tariffs, monopolistic services, inflexible equipment standards, and restrictive patterns of access. In part this is a classical effort at « creaming the market », in part it is a frantic attempt at conserving control over communications (to maintain revenues and protect the outdated tele technology), and in part it is done under pressure from authorities concerned with social control (military, etc.) and « trans-border data flows ».

At a time when energy costs are soaring, it is incredible that the communications, on which our civilization depends to maintain the « social fabric » and innovative learning processes, should be taxed so heavily and so artificially. This cynical irresponsibility should be recognized in terms of its inhibiting effect on learning and all aspects of future access to international documentation. The International Telecommunications Union bears a heavy responsibility in this matter, especially in the light of the « promises » of its World Communications Year (1983).

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