emergent man

Julius Stulman/Erwin Laszlo, editors

EMERGENT MAN

His Chances, Problems and Potentials

WORLD INSTITUTE CREATIVE FINDINGS

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VOLUME 1 **Emergent Man**
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PREFACE

THE PRESENT book is the first of a series of publications titled "World Institute Creative Findings". These volumes are designed to bring to the attention of intelligent and concerned people everywhere, facets of the new knowledge gathered from many fields of research and inquiry, capable of solving problems and safeguarding and enhancing the values of the human situation.

The contributors to this volume are thinkers of accomplishment on their respective fields and need no special introduction. They attack similar issues from their personal points of view. They are united, however, by two powerful factors: their belief in the guidance of human destiny by informed theory; and their general orientation toward what may be best described as "systems thinking". Jointly, these essays illuminate, in these many different ways, the manifold problems of the current situation, and discuss the chances and potentials of man himself. They are a testimony to the power of a way of thinking that "sees things whole" and knows how to discriminate the important from the trivial. From these ideas, myriad avenues open for creative thinking; many of them, the editors believe, can ultimately lead to the clarification of the road ahead. With the exception of "Art and Human Creativity", and "The Cosmic Lens...", the essays included in this first volume originally appeared in The World Institute's privately circulated pamphlet series *Fields Within Fields ... Within Fields*. The editors wish to express their appreciation to all authors for their creative additions to their original contributions, and for their help and collaboration in the preparation of this book.

INTRODUCTION

THE IDEAS presented in this volume are meant to indicate the functional methodology of the creative process underlying the concepts of the World Institute. The principles set forth are not just a philosophy but a commitment of "man coming whole" as he relates inextricably to mankind and the universe. We shall attempt to indicate how, by establishing a new "brain resource" capable of maximizing man's total knowledge through a new methodology in constant flow, cross-catalytically, across all disciplines—feeding back new values to the "system man", we shall enable him to continue his growth in hierarchical stages, biologically-psychologically through the creative process, and help him to resolve problems that heretofore, in more limited orientations, seemed intractable.

In all of recorded history man has not witnessed a period of such demanding evolutionary challenge to further evolve, survive, or perish; to preserve and enhance human values or sink to the bare minimum of a subhuman level of physical existence. These are the challenges facing today's man. Man is in crisis; in metamorphosis. He must recognize that the chaos in today's scene is stating challenges, and offering the opportunity to move:

From outer man-concerns to inner man and mankind-concerns;
From material-orientation—things—to values;
From an era of scarcity to one of abundance;
From the atomistic knowledge of "facts" to the integrative dynamics of the knowing *process;*
From the competitive, to the non-competitive through the creative process;
From seeming chaos to order;
From the singular to a comprehensive wholeness, to natural laws.

Man is likewise offered the ability to:

Communicate through new key symbols offered in role-playing practical action programs;

Apply the growing technology he has developed to the concerns of all mankind, capturing the creative imagination of deprived peoples the world round, and of oncoming generations;

Learn to live in change itself;

Become part of a dynamic *system*, moving away from over-simplified reactions to our adventures;

Recognize that men are systems within systems, fields within fields;

Appreciate the in-depth complexity of each individual's constantly adaptive and corrective, dynamic feedback interrelationship with all mankind;

Maximize his total knowledge, through a methodology such as that of the World Institute, using systems solutions in an organismic sense, in flow and feedback, in constant metamorphical changes;

Bring the latest of science-technology to focus on man's problems;

Catalyze the genius of individual man to creative potentials he could not otherwise attain;

Learn to move from singular to system, from substance to organization, from isolated analysis to synthesis, from doctrinaire rigidity to the recognition of the ever changing value relationships of each of the parts, in a feedback and flow-forward continuum of new metamorphical developments;

Help men everywhere emerge as equal partners, together with all mankind, into the 21st century.

In recognition of these needs and opportunities, the World Institute proposes to establish a new knowledge resource, created by man himself, belonging to all mankind, and feeding back enhanced abilities to individual men. For man has great adaptive potential, and the agency of his adaptation is no longer the slow process of genetic mutation and natural selection, but the rapid one of evolving abstract conceptual categories and bringing them to bear on practical issues. It is to the development of the conceptual tools for adaptation for survival with human excellence, that this volume, a part of the ongoing activities of the World Institute Council, is dedicated.

E. L.
J. S.

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PART ONE

MAN AND MIND

1

Towards A Humanistic Biology*

ABRAHAM H. MASLOW†

My adventures in psychology have led me in all sorts of directions, some of which have transcended the field of conventional psychology—at least in the sense in which I was trained.

In the thirties I became interested in certain psychological problems, and found that they could not be answered or managed well by the classical scientific structure of the time (the behavioristic, positivistic, "scientific", value-free, mechanomorphic psychology). I was raising legitimate questions and had to invent another approach to psychological problems in order to deal with them. This approach slowly became a general philosophy of psychology, of science in general, of religion, work, management, and now biology. As a matter of fact, it became a *Weltanschauung*.

Psychology today is torn and riven, and may in fact be said to be three (or more) separate, noncommunicating sciences or groups of scientists. First is the behavioristic, objectivistic, mechanistic, positivistic group. Second is the whole cluster of psychologies that originated

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* This is excerpted from a series of memoranda that were written during March and April 1968, at the request of the Director of the Salk Institute of Biological Studies in the hope that they might help in the move away from a value-free technologizing toward a humanized philosophy. In these memoranda I leave aside all the obvious frontier questions in biology and confine myself to what I think is being neglected or overlooked or misinterpreted—all this from my special standpoint as a psychologist.

† The late Abraham H. Maslow of the Laughlin Foundation, Menlo Park, California, was president of The American Psychology Association, and held the chair of the Dept. of Psychology at Brandeis University.

in Freud and in psychoanalysis. And third there are the humanistic psychologies, or the "Third Force" as this group has been called, a coalescence into a single philosophy of various splinter groups in psychology. It is for this third psychology that I want to speak. I interpret this third psychology to include the first and second psychologies, and have invented the words "epi-behavioristic" and "epi-Freudian" (*epi* = upon) to describe it. This also helps to avoid the sophomoric two-valued, dichotomized orientation, for example, of being either pro-Freudian or anti-Freudian. I am Freudian and I am behavioristic and I am humanistic, and as a matter of fact I am developing what might be called a fourth psychology of transcendence as well. Here I speak for myself. Even among the humanistic psychologists, some tend to see themselves as *opposed* to behaviorism and psychoanalysis, rather than as including these psychologies in a larger superordinate structure. I think some of them hover on the edge of anti-science and even anti-rational feelings in their new enthusiasm for "experiencing". However, since I believe that experiencing is only the beginning of knowledge (necessary but not sufficient), and since I also believe that the advancement of knowledge, that is, a much broadened science, is our only ultimate hope, I had *better* speak only for myself.

It is my personally chosen task to "speculate freely", to theorize, to play hunches, intuitions, and in general to try to extrapolate into the future. This is a kind of deliberate preoccupation with pioneering, scouting, originating, rather than applying, validating, checking, verifying. Of course it is the latter that is the backbone of science. And yet I feel it is a great mistake for scientists to consider themselves *merely* and only verifiers.

The pioneer, the creator, the explorer is generally a single, lonely person rather than a group, struggling all alone with his inner conflicts, fears, defenses against arrogance and pride, even against paranoia. He has to be a courageous man, not afraid to stick his neck out, not afraid even to make mistakes, well aware that he is, as Polanyi (1958) has stressed, a kind of gambler who comes to tentative conclusions in the absence of facts and then spends some years trying to find out if his hunch was correct. If he has any sense at all, he is of course scared of his own ideas, of his temerity, and is well aware that he is affirming what he cannot prove.

It is in this sense that I am presenting personal hunches, intuitions, and affirmations.

I think the question of a normative biology cannot be escaped or avoided, even if this calls into question the whole history and philo-

sophy of science in the West. I am convinced that the value-free, value-neutral, value-avoiding model of science that we inherited from physics, chemistry, and astronomy, where it was necessary and desirable to keep the data clean and also to keep the church out of scientific affairs, is quite unsuitable for the scientific study of life. Even more dramatically is this value-free philosophy of science unsuitable for human questions, where personal values, purposes and goals, intentions and plans are absolutely crucial for the understanding of any person, and even for the classical goals of science: prediction, and control.

I know that in the area of evolutionary theory the arguments about direction, goals, teleology, vitalism, final causes, and the like have raged hot and heavy—my own impression, I must say, is that the debate has been muddled—but I must also submit my impression that discussing these same problems at the human psychological level sets forth the issues more clearly and in a less avoidable way.

It is still possible to argue back and forth about autogenesis in evolution, or whether pure chance collocations could account for the direction of evolution. But this luxury is no longer possible when we deal with human individuals. It is absolutely impossible to say that a man becomes a good physician by pure chance, and it is time we stopped taking any such notion seriously. For my part, I have turned away from such debates over mechanical determinism without even bothering to get into the argument.

THE GOOD SPECIMEN AND GROWING-TIP STATISTICS

I propose for discussion and eventually for research the use of selected good specimens (superior specimens) as biological assays for studying the best capability that the human species has. To give several examples: For instance, I have discovered in exploratory investigations that self-actualizing people, that is, psychologically healthy, psychologically "superior" people, are better cognizers and perceivers. This may be true even at the sensory level itself; for example, it would not surprise me if they turned out to be more acute about differentiating fine hue differences, etc. An uncompleted experiment that I once organized may serve as a model for this kind of "biological assay" experimentation. My plan had been to test the whole of each incoming freshman class at Brandeis University with the best techniques available at the time—psychiatric interviews, projective tests, performance tests, etc.—

and select the healthest 2% of our population, a middle 2%, and the least healthy 2%. We planned to have these three groups take a battery of about 12 sensory, perceptive, and cognitive instruments, testing the previous clinical, personological finding that healthier people are better perceivers of reality. I predicted these findings would be supported. My plan then was to continue following these people through the four years of college where I could then correlate our initial test ratings with actual performance, achievement, and success in the various departments of life in a university. I also thought that it would be possible to set up a longitudinal study carried out by a longitudinally organized research team that would exist beyond our lifetimes.

The idea was to seek the ultimate validations of our notions of health by pursuing the whole group through their entire lifetimes. Some of the questions were obvious, for example, longevity, resistance to psychosomatic ailments, resistance to infection, etc. We also expected that this follow-up would reveal unpredictable characteristics as well. This study was in a spirit similar to Lewis Terman's when he selected, about 40 years ago, children in California with high IQs and then tested them in many ways, through the succeeding decades and up to the present time. His general finding was that children chosen because they were superior in intelligence were superior in everything else as well. The great generalization that he wound up with was that all desirable traits in a human being correlate positively.

What this kind of research design means is a change in our conception of statistics, and especially of sampling theory. What I am frankly espousing here is what I have been calling "growing-tip statistics", taking my title from the fact that it is at the growing tip of a plant that the greatest genetic action takes place. As the youngsters say, "That's where the action is".

If I ask the question, "Of what are human beings capable?" I put the question to this small and selected superior group rather than to the whole of the population. I think that the main reason that hedonistic value theories and ethical theories have failed throughout history has been that the philosophers have locked in pathologically motivated pleasures with healthily motivated pleasures and struck an average of what amounts to indiscriminately sick and healthy, indiscriminately good and bad specimens, good and bad choosers, biologically sound and biologically unsound specimens.

If we want to answer the question how tall can the human species grow, then obviously it is well to pick out the ones who are already

tallest and study them. If we want to know how fast a human being can run, then it is no use to average out the speed of a "good sample" of the population; it is far better to collect Olympic gold medal winners and see how well they can do. If we want to know the possibilities for spiritual growth, value growth, or moral development in human beings, then I maintain that we can learn most by studying our most moral, ethical or saintly people.

On the whole I think it fair to say that human history is a record of the ways in which human nature has been sold short. The highest possibilities of human nature have practically always been underrated. Even when "good specimens", the saints and sages and great leaders of history, have been available for study, the temptation too often has been to consider them not human but supernaturally endowed.

HUMANISTIC BIOLOGY AND THE GOOD SOCIETY

It is now quite clear that the actualization of the highest human potentials is possible—on a mass basis—only under "good conditions". Or more directly, good human beings will generally need a good society in which to grow. Contrariwise, I think it should be clear that a normative philosophy of biology would involve the theory of the good society, defined in terms of "that society is good which fosters the fullest development of human potentials, of the fullest degree of humanness". I think this may at first sight be a little startling to the classical descriptive biologist who has learned to avoid such words as "good" and "bad", but a little thought will show that something of the sort is already taken for granted in some of the classical areas of biology. For instance, it is taken for granted that genes can be called "potentials" that are actualized or not actualized by their immediate surroundings in the germ plasm itself, in the cytoplasm, in the organism in general, and in the geographical environment in which the organism finds itself.

To cite a single line of experimentation (Bennett, Diamond, Krech, and Rosenzweig, 1964) we can say for white rats, monkeys, and human beings that a stimulating environment in the early life of the individual has quite specific effects on the development of the cerebral cortex in what we would generally call a desirable direction. Behavioral studies at Harlow's Primate Laboratory come to the same conclusion. Isolated animals suffer the loss of various capacities, and beyond a certain point these losses frequently become irreversible. At the Jackson Labs in Bar Harbor, to take another example, it was found that dogs allowed to run

loose in the fields and in packs, without human contact, lose the potentiality for becoming domesticated, that is, pets.

Finally, if children in India are suffering irreversible brain damage through lack of proteins in their diet, as is now being reported, and if it is agreed that the political system of India, its history, its economics, and its culture are all involved in producing this scarcity, then it is clear that human specimens need good societies to permit them to actualize themselves as good specimens.

Is it conceivable that a philosophy of biology could develop in social isolation, that it could be politically entirely neutral, that it need not be Utopian or Eupsychian or reformist or revolutionary? I do not mean that the task of the biologist need go over into social action. I think this is a matter of personal taste and I know some biologists will, out of their anger at seeing their knowledge unused, go over into political effectuation of their discoveries. But quite apart from this, my immediate proposal for biologists is that they recognize that once they have swallowed the normative approach to the human species, or any other species, that is, once they have accepted as their obligation the development of the good specimen, then it becomes equally their scientific obligation to study all those conditions that conduce to the development of the good specimen, and those conditions that inhibit such development. Obviously, this means emergence from the laboratory and into society.

THE GOOD SPECIMEN AS THE CHOOSER FOR THE WHOLE SPECIES

It has been my experience through a long line of exploratory investigations going back to the thirties that the healthiest people (or the most creative, or the strongest, or the wisest, or the saintliest) can be used as biological assays, or perhaps I could say, as advanced scouts, or more sensitive perceivers, to tell us less sensitive ones what it is that we value. What I mean is something like this: It is easy enough to select out, for instance, persons who are aesthetically sensitive to colors and forms and then learn to submit ourselves or to defer to their judgment about colors, forms, fabrics, furniture, and the like. My experience is that if I get out of the way and do not intrude upon the superior perceivers, then I can confidently predict that what they like immediately, I will slowly get to like in perhaps a month or two. It is as if they were I, only more sensitized, or as if they were I, with less doubt, confusion, and uncer-

tainty. I can use them, so to speak, as my experts, just as art collectors will hire art experts to help them with their buying. (This belief is supported by the work of Child, 1968, which shows that experienced and expert artists have similar tastes, even cross-culturally.) I hypothesize also that such sensitives are less susceptible to fads and fashions than average people are.

Now in this same way I have found that if I select psychologically healthy humans what they like is what human beings *will* come to like. Aristotle is pertinent here: "What the superior man thinks is good, that is what is *really* good."

For instance, it is empirically characteristic of self-actualizing people that they have far less doubt about right and wrong than average people do. They do not get confused just because 95% of the population disagrees with them. And I may mention that at least in the group I studied they tended to agree about what was right and wrong, as if they were perceiving something real and extrahuman rather than comparing tastes that might be relative to the individual person. In a word, I have used them as value assayers or perhaps I should better say that I have learned from them what ultimate values probably are. Or to say it in another way, I have learned that what great human beings value are what I will eventually agree with, what I will come to value, and I will come to see as worthy of, as valuable in some extrapersonal sense, and what "data" will eventually support.

I have published a paper (Maslow, 1967) that ultimately rests upon this operation, namely, of taking superior people who are also superior perceivers not only of facts but of values, and then using their choices of ultimate values as possibly the ultimate values for the whole species.

I am being almost deliberately provocative here. I could phrase it, if I wished, in a far more innocent fashion simply by asking the question, "Supposing you select out psychologically healthy individuals, what will they prefer? What will motivate them? What will they struggle or strive for? What will they value?" But I do think it best to be unmistakable here. I am deliberately raising the normative and the value questions for biologists (and for psychologists and social scientists).

Perhaps it will help to say these same things from another angle. If, as I think has been demonstrated sufficiently, the human being is a choosing, deciding, seeking animal, then the question of making choices and decisions must inevitably be involved in any effort to define the human species. But making choices and decisions is a matter of degree, a matter of wisdom, effectiveness, and efficiency. The questions then come up: Who is the good chooser? Where does he come from? What

kind of life history does he have? Can we teach this skill? What hurts it? What helps it?

These are, of course, simply new ways of asking the old philosophical questions, "Who is a sage? What is a sage?" And beyond that of raising the old axiological questions, "What is good? What is desirable? What *should* be desired?"

I must reassert that we have come to the point in biological history where we are now responsible for our own evolution. We have become self-evolvers. Evolution means selecting and therefore choosing and deciding, and this means valuing.

THE MIND-BODY CORRELATION

It seems to me that we are on the edge of a new leap into correlating our subjective lives with external objective indicators. I expect a tremendous leap forward in the study of the nervous system because of these new indications.

Two examples will be sufficient to justify this preparation for future research. One study by Olds (1955), by now very widely known, discovered by means of implanted electrodes in the septal area of the rhinencephalon that this was in effect a "pleasure center". When the white rat was hooked up in such a fashion as to be able to stimulate his own brain via these implanted electrodes, he repeated again and again the self-stimulation as long as the electrodes were implanted in this particular pleasure center. Needless to say, displeasure or pain areas were also discovered, and then the animal, given a chance to stimulate himself, refused to do so. Stimulation of this pleasure center was apparently so "valuable" (or desirable or reinforcing or rewarding or pleasurable or whatever word we use to describe the situation) for the animal that he would give up any other known external pleasure, food, sex—anything. We now have sufficient parallel human data to be able to guess for the human being that there are, in the subjective sense of the word, pleasure experiences that can be produced in this fashion. This kind of work is only in its beginning stages, but already some differentiation has been made between different "centers" of this sort, centers for sleep, food satiation, sexual stimulation and sexual satiation, etc.

If we integrate this kind of experimentation with another kind, for instance that of Kamiya, then new possibilities open up. Kamiya (1968), working with EEG and operant conditioning, gave the subject

a visible feedback when the alpha wave frequency in his own EEG reached a certain point. In this way, by permitting human subjects to correlate an external event or signal and a subjectively felt state of affairs, it was possible for Kamiya's subjects to establish voluntary control over their own EEGs. That is, he demonstrated that it was possible for a person to bring his own alpha wave frequency to a particular desired level.

What is seminal and exciting about this research is that Kamiya discovered quite fortuitously that bringing the alpha waves to a particular level could produce in the subject a state of serenity, meditativeness, even happiness. Some follow-up studies with people who have learned the Eastern techniques of contemplation and meditation show that they spontaneously emit EEGs that are like the "serene" ones into which Kamiya was able to educate his subjects. This is to say that it is already possible to teach people how to feel happy and serene. The revolutionary consequences, not only for human betterment, but also for biological and psychological theory, are multitudinous and obvious. There are enough research projects here to keep squadrons of scientists busy for the next century. The mind-body problem, until now considered insoluble, does appear to be a workable problem after all.

Such data are crucial for the problem of a normative biology. Apparently it is now possible to say that the healthy organism itself gives clear and loud signals about what it, the organism, prefers or chooses, or considers to be desirable states of affairs. Is it too big a jump to call these "values"? Biologically intrinsic values? Instinct—like values? If we make the descriptive statement, "The laboratory rat, given a choice between pressing two auto-stimulus-producing buttons, presses the pleasure center button practically 100% of the time in preference to any other stimulus-producing or self-stimulus-producing button", is this different in any important way from saying "The rat prefers self-stimulation of his pleasure center?"

I must say that it makes little difference to me whether I use the word "values" or not. It is certainly possible to describe everything I have described without ever using this word. Perhaps as a matter of scientific strategy, or at least the strategy of communication between scientists and the general public, it might be more diplomatic if we do not confuse the issue by speaking of values. It does not really matter, I suppose. However, what does matter is that we take quite seriously these new developments in the psychology and biology of choices, preferences, reinforcements, rewards, etc.

I should point out also that we will have to face the dilemma of a

certain circularity that is built into this kind of research and theorizing. It is most clear with human beings, but my guess is that it will also be a problem with other animals. It is circularity that is implied in saying that "the good specimen or the healthy animal chooses or prefers such and such". How shall we handle the fact that sadists, perverts, masochists, homosexuals, neurotics, psychotics, suicidals make different choices than do "healthy human beings"? Is it fair to parallel this dilemma with that of adrenalectomized animals in the laboratory making different choices from so-called "normal" animals? I should make it clear that I do not consider this an insoluble problem, merely one that has to be faced and handled, rather than avoided and overlooked. It is quite easy with the human subject to select "healthy" persons by psychiatric and psychological testing techniques and *then* to point out that people who make such and such a score, let us say in the Rorschach test, or in an intelligence test, are the same people who will be good choosers in cafeteria (food) experiments. The selection criterion then is quite different from the behavior criterion. It is also quite possible, and as a matter of fact in my own opinion quite probable, that we are within sight of the possibility of demonstrating by neurological self-stimulation that the so-called "pleasures" of perversion or murder or sadism or fetishism are not "pleasures" in the same sense that is indicated in the Olds or Kamiya experiments. Certainly this is what we already know from our subjective psychiatric techniques. Any experienced psychotherapist learns sooner or later that underlying the neurotic "pleasures" or perversions is actually a great deal of anguish, pain, and fear. Within the subjective realm itself, we know this from people who have experienced both unhealthy and healthy pleasures. They practically always report preference for the latter and learn to shudder at the former. Colin Wilson (1963) has demonstrated clearly that sexual criminals have very feeble sexual reactions, not strong ones. Kirkendall (1961) also shows the subjective superiority of loving sex over unloving sex.

I am now working with one set of implications that are generated by a humanistic-psychological point of view of the sort I have sketched out above. It may serve to show the radical consequences and implications for a humanistic philosophy of biology. It is certainly fair to say that these data are on the side of self-regulation, self-government, self-choice of the organism. The organism has more tendency toward choosing health, growth, biological success than we would have thought a century ago. This is in general anti-authoritarian, anti-controlling. For me it brings back into serious focus the whole Taoistic point of view,

not only as expressed in contemporary ecological and ethological studies, where we have learned not to intrude and to control, but also in regard to trusting more the child's own impulses toward growth and self-actualization. This means a greater stress on spontaneity and on autonomy rather than on prediction and external control. To paraphrase a main thesis from my *Psychology of Science* (Maslow, 1966):

> In the light of such facts, can we seriously continue to define the goals of science as prediction and control? Almost one could say the exact opposite—at any rate, for human beings. Do we ourselves want to be predicted and predictable? Controlled and controllable? I won't go so far as to say that the question of free will must necessarily be involved here in its old and classical philosophical form. But I will say that questions come up here and clamor for treatment which do have something to do with the subjective feeling of being free rather than determined, of choosing for oneself rather than being externally controlled, etc. In any case, I can certainly say that descriptively healthy human beings do not like to be controlled. They prefer to feel free and to be free.

Another very general "atmospheric" consequence of this whole way of thinking is that it must inevitably transform the image of the scientist, not only in his own eyes but in the eyes of the general population. There are already data (Mead and Metraux, 1957) which indicate that, for instance, high school girls think of scientists as monsters and horrors, and are afraid of them. They do not think of them as good potential husbands, for instance. I must express my own opinion that this is not merely a consequence of Hollywood "Mad Scientist" movies; there is something real and justified in this picture, even if it is terribly exaggerated. The fact is that the man who controls, the man who is in charge, the man who does things to people, to animals, or to things, is the master of what he surveys. This picture is even more clear in surveys of the "image of the physician". He is generally seen at the semiconscious or unconscious level as a master, a controller, a cutter, a dealer out of pain, etc. He is definitely the boss, the authority, the expert, the one who takes charge and tells people what to do. I think this "image" is now worst of all for psychologists: college students now consider them to be, very frequently, manipulators, liars, concealers, and controllers.

What if the organism is seen as having "biological wisdom"? If we learn to give it greater trust as autonomous, self-governing, and self-choosing, then clearly we as scientists, not to mention physicans, teachers, or even parents, must shift our image over to a more *Taoistic* one. This is the one word that I can think of that summarizes suc-

cintly the many elements of the image of the more humanistic scientist. Taoistic means asking rather than telling. It means non-intruding, non-controlling. It stresses non-interfering observation rather than a controlling manipulation. It is receptive and passive rather than active and forceful. It is like saying that if you want to learn about ducks, then you had better ask the ducks instead of telling them. So also for human children. In prescribing "what is best for them" it looks as if the best technique for finding out what is best for them is to develop techniques for getting *them* to tell us what is best for them.

In point of fact, we already have such a model in the good psychotherapist. This is about the way he functions. His conscious effort is not to impose his will upon the patient, but rather to help the patient—articulate, unconscious, semi-conscious—to discover what is inside *him*, the patient. The psychotherapist helps him to discover what he himself wants or desires, what is good for him, the patient, rather than what is good for the therapist. This is the opposite of controlling, propagandizing, molding, teaching in the old sense. It definitely rests upon the implications and assumptions that I have already mentioned, although I must say they are very rarely made. I mean such implications as trust in the health-moving direction of most individuals, of expecting them to prefer health to illness; of believing that a state of subjective well-being is a pretty good guide to what is "best for the person". This attitude implies a preference for spontaneity rather than for control, for trust in the organism rather than mistrust. It assumes that the person wants to be fully human rather than that he wants to be sick, pained, or dead. Where we do find, as psychotherapists, death wishes, masochistic wishes, self-defeating behavior, self-infliction of pain, we have learned to assume that this is "sick" in the sense that the person himself, if he ever experiences another healthier state of affairs, would far rather have that healthier state of affairs than his pain. As a matter of fact, some of us go so far as to consider masochism, suicidal impulses, self-punishment, and the like as stupid, ineffective, clumsy groping toward health.

Something very similar is true for the new model of the Taoistic teacher, the Taoistic parent, the Taoistic friend, the Taoistic lover, and finally the more Taoistic scientist.

TAOISTIC OBJECTIVITY AND CLASSICAL OBJECTIVITY*

The classical conception of objectivity came from the earliest days of scientific dealing with things and objects, with lifeless objects of study. We were objective when our own wishes and fears and hopes were excluded from the observation, and when the purported wishes and designs of a supernatural god were also excluded. This of course was a great step forward and made modern science possible. We must, however, not overlook the fact that this was true for dealing with nonhuman objects or things. Here this kind of objectivity and detachment works pretty well. It even works well with lower organisms. Here too we are detached enough, noninvolved enough so that we can be relatively noninterfering spectators. It does not *matter* to us to any great degree which way an amoeba goes or what a hydra prefers to ingest. This detachment gets more and more difficult as we go up the phyletic scale. We know very well how easy it is to anthropomorphize, to project into the animal the observer's human wishes, fears, hopes, prejudices if we are dealing with dogs or cats, and more easily with monkeys or apes. When we get to the study of human beings, we can now take it for granted that it is practically impossible to be the cool, calm, detached, uninvolved, noninterfering spectator. Psychological data have piled up to such a point that no one could conceivably defend this position.

Any social scientist who is at all sophisticated knows that he must examine his own prejudices and preconceptions *before* going in to work with any society or a subcultural group. This is one way of getting around prejudgments—to know about them in advance.

But I propose that there is another path to objectivity, that is, in the sense of greater perspicuity, of greater accuracy of perception of the reality out there outside ourselves, outside the observer. It comes originally from the observation that loving perception, whether as between sweethearts or as between parents and children, produced kinds of knowledge that were not available to non-lovers. Something of the sort seems to me to be true for the ethological literature. My work with monkeys, I am sure, is more "true", more "accurate", in a certain sense, more *objectively* true than it would have been if I had disliked monkeys. The fact was that I was fascinated with them. I became fond of my individual monkeys in a way that was not possible with my rats. I believe that the kind of work reported by Lorenz, Tinbergen,

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* For a fuller treatment of this topic see *Psychology of Science* (Maslow, 1966).

Goodall, and Schaller is as good as it is, as instructive, illuminating, true, because these investigators "loved" the animals they were investigating. At the very least this kind of love produces interest and even fascination, and therefore great patience with long hours of observation. The mother, fascinated with her baby, who examines every square inch of it again and again with the greatest absorption, is certainly going to know more about her baby in the most literal sense than someone who is not interested in that particular baby. Something of the sort, I have found, is true between sweethearts. They are so fascinated with each other that examining, looking, listening, and exploring becomes itself a fascinating activity upon which they can spend endless hours. With a non-loved person this would hardly be the case. Boredom would set in too rapidly.

But "love knowledge", if I may call it that, has other advantages as well. Love for a person permits him to unfold, to open up, to drop his defenses, to let himself be naked not only physically but psychologically and spiritually as well. In a word, he lets himself be seen instead of hiding himself. In ordinary interpersonal relations, we are to some extent inscrutable to each other. In the love relationships, we become "scrutable".

But finally, and perhaps most of all, if we love or are fascinated or are profoundly interested, we are less tempted to interfere, to control, to change, to improve. My finding is that, that which you love, you are prepared to leave alone. In the extreme instance of romantic love, and of grandparental love, the beloved person may even be seen as already perfect so that any kind of change, let alone improvement, is regarded as impossible or even impious.

In other words, we are content to leave it alone. We make no demands upon it. We do not wish it to be other than it is. We can be passive and receptive before it. Which is all to say that we can see it more truly as it is in its own nature rather that as we would like it to be or fear it to be or hope it will be. Approving of its existence, approving of the way it is, as it is, permits us to be nonintrusive, nonmanipulating, nonabstracting, noninterfering perceivers. To the extent that it is possible for us to be nonintrusive, nondemanding, nonhoping, nonimproving, to that extent do we achieve this particular kind of objectivity. This is, I maintain, a method, a particular path to certain kinds of truth, which are better approached and achieved by this path. I do *not* maintain that it is the only path, or that all truths are obtainable in this way. We know very well from this very same kind of situation that it is also possible via love, interest, fascination, absorption, to distort

certain *other* truths about the object. I would maintain only that in the full armamentarium of scientific methods, that love knowledge or "Taoistic objectivity" has its particular advantages in particular situations for particular purposes. If we are realistically aware that the love for the object of study produces certain kinds of blindness as well as certain kinds of perspicuity, then we are sufficiently forewarned.

I would go as far as to say this even about "love for the problem". On the one hand it is obvious that you have to be fascinated with schizophrenia or at least interested in it to be able to stick at it and be able to learn about it and to do research with it. On the other hand we know also that the person who becomes totally fascinated with the problem of schizophrenia tends to develop a certain imbalance with reference to other problems.

THE PROBLEM OF BIG PROBLEMS

I use here the title of a section in the excellent book by Alvin Weinberg (1967), *Reflections on Big Science*, a book which *implies* many of the points that I would prefer to make explicit. Using his terminology I can state in a more dramatic form the purport of my memorandum. What I am suggesting is Manhattan-Project-type attacks upon what I consider to be the truly Big problem* of our time, not only for psychology but for all human beings with any sense of historical urgency (a criterion of the "importance" of a research that I would now add to the classical criteria).

The first and overarching Big Problem is to make the Good Person. We must have better human beings or else it is quite possible that we may all be wiped out, and even if not wiped out, certainly live in tension and anxiety as a species. A *sine qua non* pre-requisite here is of course defining the Good Person, and I have made various statements about this throughout these memoranda. I cannot stress enough that we already have some beginning data, some indicators, perhaps as many as were available for the Manhattan Project people. I myself feel confident that the great crash program would be feasible, and I am sure that I could list 100, or 200, or 2,000 part problems or subsidiary problems, certainly enough to keep a huge number of people busy. This Good Person can equally be called the self-evolving person, the responsible-for-himself-and-his own-evolution person, the fully illumi-

* I keep Weinberg's meaningful way capitalizing.

nated or awakened or perspicuous man, the fully human person, the self-actualizing person, etc. In any case it is quite clear that no social reforms, no beautiful constitutions or beautiful programs or laws will be of any consequence unless people are healthy enough, evolved enough, strong enough, good enough to understand them and to want to put them into practice in the right way.

The equally Big Problem as urgent as the one I have already mentioned is to make the Good Society. There is a kind of feedback between the Good Society and the Good Person. They need each other, they are *sine qua non* to each other. I wave aside the problem of which comes first. It is quite clear that they develop simultaneously and in tandem. It would in any case be impossible to achieve either one without the other. By Good Society I mean ultimately one species, one world. We also have beginning information (Maslow, 1964, 1965b) on the possibility of autonomously societal, that is nonpsychological, arrangements. To clarify, it is now clear that with the goodness of the person held constant, it is possible to make social arrangements that will force these people into either evil behavior or into good behavior. The main point is that social institutional arrangements must be taken as different from intrapsychic health, and that to some extent the goodness or badness of a person depends upon the social institutions and arrangements in which he finds himself.

The key notion of social synergy is that in some primitive cultures, and within the large, industrial cultures, there are some social trends that transcend the dichotomy between selfishness and unselfishness. That is, there are some social arrangements that set people against each other necessarily; there are other social arrangements in which a person seeking his own selfish good necessarily helps other people whether he wishes to or not. Contrariwise, the person seeking to be altruistic and to help other people must then necessarily reap selfish benefits. A single example of this would be, for instance, the economic measures like our income tax that siphons off benefits for the general population from any single person's good fortune. This is by contrast with sales taxes that take away proportionately more from poor people than they do from rich people and have, instead of a siphoning effect, what Benedict called a funneling effect (Maslow, 1964).

I must stress as solemnly and seriously as I can that these are the ultimate Big Problems, coming before any other ones. Most of the technological goods and advances that Weinberg speaks about in his book, and that other people have spoken about, can be considered essentially *means* to these ends and not ends in themselves. This means that unless

we put our technological and biological improvements in the hands of good men, these improvements will be either useless or dangerous. And I include here even the conquest of disease, the increase of longevity, the subduing of pain and of sorrow and of suffering in general. The point is: Who wants to make the evil man live longer? Or be more powerful? An obvious example here is the use of atomic energy and the race to achieve its military use before the Nazis did. Atomic energy in the hands of a Hitler—and there are many in charge of nations today—is certainly no blessing. It is a great danger. The same is true for any other technological improvements. One can always ask the criterion question: Would this be good for a Hitler or bad for a Hitler?

A by-product of our technological advance is that it is quite possible and even probable that evil men are more dangerous, more a threat today than they have ever been before in human history, simply because of the powers given to them by advanced technology. It is quite probable that a totally ruthless man backed up by a ruthless society could not be beaten. I think that if Hitler had won, rebellions would not have been possible, and in fact his Reich *might* have lasted 1,000 years or more.

Therefore I would urge all biologists, as I would urge all other people of goodwill, to put their talents into the service of these two Big Problems.

The above considerations have strongly supported my feeling that the classical philosophy of science as morally neutral, value free, value neutral is not only wrong, but is extremely dangerous as well. It is not only amoral; it may be antimoral as well. It may put us into great jeopardy. Therefore I would stress again that science itself comes out of human beings and human passions and interests, as Polanyi (1958) has so brilliantly set forth. Science itself must be a code of ethics as Bronowski (1959) has so convincingly shown, since if one grants the intrinsic worth of truth, then all sorts of consequences are generated by placing ourselves in the service of this one intrinsic value. I would add as a third point that science can seek values, and can uncover them within human nature itself. As a matter of fact, I would claim it has already done so, at least to a level that would make this statement plausible, even though not adequately and finally proven. Techniques are now available for finding out what is good for the human species, that is, what the intrinsic values of human beings are. Several different operations have been used to indicate what these built-in values in human nature are. This is, I reiterate, both in the sense of survival

value and also in the sense of growth values, that is, what makes man healthier, wiser, more virtuous, happier, more fulfilled.

This suggests what I might alternatively call strategies of future research for biologists. One is that there is a synergic feedback between the pursuit of mental health and physical health. Most psychiatrists and many psychologists and biologists now have come simply to assume that practically all diseases, and perhaps even all diseases without exception, can be called psychosomatic or organismic. That is, if one pursues any "physical" illness far enough and deep enough, one will find inevitably intrapsychic, intrapersonal and social variables that are also involved as determinants. This is not to etherealize tuberculosis or broken bones. It simply means that in the study of tuberculosis one finds that poverty is also a factor. As far as broken bones are concerned, once Dunbar (1943) used fracture cases as a control group, assuming that *here* certainly no psychological factors could be involved, but found to her amazement that they were indeed involved. And we are now as a consequence very sophisticated about the accident-prone personality, as well as—if I may call it so—the "accident-fostering environment". Which is to say that even a broken bone is psychosomatic and "sociosomatic", if I may coin that term as well. This is all to say that even the classical biologist or physician or medical researcher, seeking to relieve human pain, suffering, illness, is well advised to be more holistic than he has been concerning the psychological and social determinants for of the illnesses he has been studying. For instance, there are already enough data today to indicate that a fruitful broad spectrum attack upon cancer should also include so-called "psychosomatic factors".

To say this in another way, the indications are (this is mostly extrapolation rather than hard data) that making the Good Person, increasing psychological health, through, for example, psychiatric therapies, can probably also increase his longevity and reduce his susceptibility to disease.

Not only may lower-need deprivations produce illnesses that must be called in the classical sense "deficiency diseases", but this seems also to be true for what I have called the metapathologies (Maslow, 1967), that is, for what have been called the spiritual or philosophical or existential ailments. These too may have to be called deficiency diseases.

To summarize briefly, the loss of the basic-need satisfactions of safety and protection, belongingness, love, respect, self-esteem, identity, and

self-actualization produces illnesses and deficiency diseases. Taken together, these can be called the neuroses and psychoses. However, basically need-satisfied and already self-actualizing people with such metamotives as truth, goodness, beauty, justice, order, law, unity, etc., may suffer deprivation at the metamotivational level. Lack of metamotive gratifications, or of these values, produces what I have described as general and specific metapathologies. I would maintain that these are deficiency diseases on the same continuum with scurvy, pellagra, love-hunger, etc. I should add here that the classical way of demonstrating a body need, as for vitamins, minerals, basic amino acids, etc., has been first a confrontation with a disease of unknown cause, and *then* a search for this cause. That is to say, something is considered to be a need if its deprivation produces disease. It is in exactly this same sense that I would maintain that the basic needs and metaneeds that I have described are also in the strictest sense biological needs; that is, their deprivation produces disease or illness. It is for this reason that I have used the invented term "instinctoid" to indicate my firm belief that these data have already proven sufficiently that these needs are related to the fundamental structure of the human organism itself, that there is some genetic basis that is involved, however weak this may be. It also leads me to be very confident of the discovery one day of biochemical, neurological, endocrinological substrates or body machinery that will explain at the biological level these needs and these illnesses (Maslow, 1965a).

PREDICTING THE FUTURE

In the last few years there has been a rash of conferences, books, symposia, not to mention newspaper articles and Sunday magazine sections, about what the world will be like in the year 2000 or in the next century. I have glanced through this "literature", if one could call it that, and have generally been more alarmed than instructed by it. A good 95 per cent of it deals entirely with purely technological changes, leaving aside completely the question of good and bad, right and wrong. Sometimes the whole enterprise seems almost entirely amoral. There is much talk about new machines, prosthetic organs, new kinds of automobiles or trains or planes—in effect, bigger and better refrigerators and washing machines. Sometimes, or course, this literature frightens me as well when there is casual talk about the increased capacity for mass destruction, even to the possibility that the whole human species might be wiped out.

It is itself a sign of blindness to the real problems that are involved, that practically all of the people who get involved in these conferences are nonpersonal scientists. A huge proportion are physicists and chemists and geologists, and of the biologists a large proportion are of the molecular biology type, that is, not so much the descriptive but rather the reductive type of biological worker. The psychologists and sociologists who occasionally are chosen to speak on this problem are characteristically technologists, "experts" committed to a value-free conception of science.

In any case, it is quite clear that the questions of "improving" are very much a question of the improvement of means without regard to ends, and without regard to the clear truths that more powerful weapons in the hands of stupid or evil people simply make for more powerful stupidity or for more powerful evil. That is, these technological "improvements" may be in fact dangerous rather than helpful.

Another way of expressing my uneasiness is to point out that much of this talk about the year 2000 is at a merely material level, for example, of industrialization, modernization, increasing affluence, greater possession of more things, of increasing the capacity to produce food perhaps by farming the seas, or how to handle the population explosion by making more efficient cities, etc.

Or still another way of characterizing the sophomoric nature of much of the prediction talk is this: Large portions of it are simply helpless extrapolations from what exists today, simple projections of the curves onward from where we are. At the present rate of population growth, it is said in the year 2000 there will be so many more people; at the present rate of growth of the cities, there will be such and such an urban situation in the year 2000, etc. It is as if we were helpless to master or to plan our own future—as if we could not reverse present trends when we disapproved of them. For instance, I would maintain that planning for the future ought to decrease the present world population. There is no reason in the world, or at least no biological reason, why this could not be done if mankind wished to do it. The same would be true for the structures of the cities, the structure of automobiles, or of air travel, etc. I suspect that this kind of prediction from what is the case today is itself a by-product generated by the value-free, purely descriptive conception of science.

BIBLIOGRAPHY

Bennett, E., Diamond, M., Krech, D., and Rosenzweig, M. "Chemical and anatomical plasticity of brain". *Science*, 1964, **146**, 610–619.

Bronowski, J. "The values of science". In: A. H. Maslow (Ed.), *New Knowledge in Human Values*, New York: Harper & Row, 1959.

Child, I. "The experts and the bridge of judgement that crosses every cultural gap". *Psychology Today*, 1968, **2**, 24–29.

Dunbar, H. F., *Psychosomatic Diagnosis*. New York: Hoeber, 1943.

Kamiya, J. "Conscious control of brain waves". *Psychology Today*, 1968, **1**, 56–61.

Kirkendall, L. *Premarital Intercourse and Interpersonal Relationships*. New York: Julian Press, 1961.

Maslow, A. H. "Synergy in society and in the individual". *Journal of Individual Psychology*. 1964, **29**, 153–164.

Maslow, A. H. "Criteria for judging needs to be instinctoid". In M. R. Jones (Ed.), *Human Motivation: A Symposium*. Lincoln: University of Nebraska Press, 1965, (a).

Maslow, A. H., *Eupsychian Management: A Journal*. Homewood, Ill.: Irwin, 1965, (b).

Maslow, A. H. *The Psychology of Science: A Reconnaisance*. New York: Harper & Row, 1966.

Maslow, A. H. "A theory of metamotivation: The biological rooting of the value-life". *Journal of Humanistic Psychology*, 1967, **7**, 93–127.

Mead, M., and Metraux, R. "Image of the scientist among high school students". *Science*, 1957, **126**, 384–390.

Olds, J. "Physiological mechanisms of reward". *Nebraska Symposium on Motivation*, 1955, **3**, 73–138.

Polanyi, M. *Personal Knowledge*. Chicago: University of Chicago Press, 1958.

Scheler, M. *Ressentiment*. Glencoe, Ill.: Free Press, 1961.

Weinberg, A. *Reflections on Big Science*, Cambridge, Mass.: M.I.T. Press, 1967.

Wilson, C. *Origins of the Sexual Impulse*. London: Arthur Barker, Ltd., 1963.

2

The Inside and Outside of Creativity

GARDNER MURPHY

Modern science took shape by observing and describing the world outside us—the world of stars and galaxies, planets and the face of Mother Earth. It became "exact science" when it was grasped that things observed can become things measured. With "accessory sense organs", like microscopes and sound-recording equipment for delicate playback, devices for magnifying physical effects and magnifying our sensitivity to them, we can see into the depths of nature and measure more delicately. When Watson, Crick and Wilkinson had shown, as biochemists, that the structure of the DNA molecule had to be a double helix, the exquisite X-rays of Rose Franklin gave visual confirmation of the structure. With these observational skills go mathematical skills, such as those used by Einstein in the establishment of relativity theory. Today, experimental and theoretical physics, shot through and through with mathematical sophistication, have convinced us that the "real" world is that *physical* world which observation, measurement and calculation have established!

How, then, could it possibly come about, as it did after Sputnik I, in 1957, that the demand should be made upon science that it should discover the *invisible* world within us, the world from which creative perceiving, creative imagining, creative thinking, must proceed? Had we not been told, through all the years of modern science, that the real is that which is out there, and that which lies within is "sub-

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jective", a mishmash of confusion and self-deception? How could the creative mind be observed?

Yet the difficult internal job had to be done. Psychologists, many of whom had repudiated the inner world as inaccessible, or even unreal, had to listen to the new demand. Was it not important that we observe, describe and measure the creative act? Soon there were established large research programs such as the one at the Institute of Personality Assessment and Research at the University of California at Berkeley, with Carnegie Foundation support, devoting year after year to a study of outstanding creative architects, to Army Air Force officers, to women mathematicians, and to many other groups and subgroups which had the interest and the discipline to go through long periods of close study. The studies of the architects, involving a comparison of the most universally recognized leading figures in the field of American architecture, with others who had not occurred to their peers as outstanding, made possible, step by step, the discovery of the attributes, such as "openness to new experience", which characterized the men regarded as most creative. A couple of years ago J. P. Guilford, of the University of Southern California, won an award from the American Psychological Association for his discovery and measurement of six basic attributes of the creative thinker, and this year Anne Roe won the award for detailed personality studies of creative scientists and artists. All of these studies, of course, try to be "objective" in the sense that they try to get data upon which independent scientific observers can agree. But they are likewise basically preoccupied with what goes on in the inward world of man; the world, as the poet would say, of mind and heart; the world, as the old-fashioned psychologist would say, of experience; the world, as many would say today, of that which can be viewed from many points of view simultaneously so that inner self-observation and the objective evidence of psychological experimental tests can reach a high order of mutual validation.

But there is a paradox about this contemporary habit of turning the searchlight upon the inner world. To understand the *inner* factors, we need a sophisticated study of *the total world in which creativity appears.* While other life sciences—sciences dealing with bacteria, fungi, trees, scorpions, eels, eagles, and monkeys—have been developing a science of *ecology*, a "science of the environment", man is still content with the crudest and thinnest analysis of the actual environment in which his life is cast. If one looks at the magnificent journal known as *The American Behavioral Scientist*, one will find modern studies of climate, geography, weather, water and wind, tidal wave and drought, as these are

related to human history and, necessarily, to *creativity*. Modern studies of volcanic eruptions and of tidal waves in the Mediterranean, in 1400 B.C., and of drought at Mesa Verde about 1260 A.D., for example, show how the creativity of great peoples waxed and waned as an expression of the human environment. As one studies the redistribution of oceanic waters, and of the waters of lakes and streams, one begins to understand more richly the dynamics of shifts in peoples from one region to another.

Beyond the physical changes occur also the changes in science and technology, agricultural implements and weaponry. Such a beautiful book as Geoffrey Bibby's *Four Thousand Years Ago* shows, in fascinating detail, how the environment of man, 2000 B.C., was transformed by metallurgy and navigation; for example, the chariot altered the meaning of military offense and defense. Many of the richest achievements of philosophy and science depended upon physical factors, and, of course, in many cases, human cultural inventions were an integration, at a high level, of physical, physiological, psychological, socio-cultural factors of a high order of complexity.

Unfortunately we are still in the habit of trying to write a cultural history without a sophisticated physical, physiological, ecologically rich, background. Creativity, according to my thesis, cannot be held to follow some immutable psychological self-sufficient law. Rather, with each new change in man's ecology—whether it be in terms of ice age, tidal wave, rainfall or drought—comes the opportunity on the face of the earth for new modalities, new opportunities, new challenges for a richer life.

But the issue is not the gross question whether man recognizes the ecology within which he lives. Surely historians have always honored Herodotus' capacity for describing the different environments in which human civilization has developed. This is not the main point today. The main point is that human environments are *changing* with extraordinary rapidity in all sorts of complex and subtle ways for the weal or woe of the human family, and *we are not catching up*. We are not even aware, for example, of the effects of water and air pollution until they have become quite advanced—perhaps even to the point of irreversibility. We did not discover the internal damage of cigarette smoking until both national economy and personal habit faced the gravest and most complicated problems of social, ethical, and political control.

Psychological habits from which effective or ineffective ways of living develop are an even more striking example. We thrust people from villages into cities, and from cities into the world of megalopolis,

far faster than we can work out a mature science specifying the consequences. It is not just the "bad" attributes of pollution or urbanization that I am asking the reader to consider. I am not merely asking that we recognize the stultification of urban slum existence, the muting or dulling effect upon human intelligence which has now been documented by dozens of studies on nerve cell damage and IQ damage of handicapped children. I am asking for a much more vigorous and positive approach. "Sensory enrichment" is the phrase everywhere: a richer array of colors, tones, rhythms, activities for the little child, followed by a wider variety of interesting and challenging activities which will tune up and set in gear the richest capacities of each individual. The point is, however, that we suddenly discover ourselves required to do something we simply do not know how to do. We do not have a science of ecology which will describe the interplay between home, school, neighborhood programs. The President recently noted the urgent need for more research on the special conditions under which intelligence is set free. With a vengeance, we may say high creativity is still something we are grateful to observe, and attribute instantly either to a gift of the gods or to what amounts to the same thing—some sudden eruption of a hidden genetic potential, the expression of genius coming charismatically where it would not have been expected.

The times, however, are clamoring for more. It is later than we think. We know that a science of ecology which will extend all the way from geography and climate through to the physical conditions of urban, village, and farm life, intimately related to the newer crafts and skills relating to fuels, transportation, distribution, including the economics and psychology of intergroup communication everywhere, is the very least we can offer. Indeed, neglect of the ecology of the Middle East and the Mediterranean Basin, neglect of the ecology of Southeast Asia, the purely military and economic conception of the utilization of land and human resources, has landed us in a desperate fix. The answer, of course, lies in creativity—the pearl of great price—the imaginative development of new human systems of communication and production. Perhaps communication should come first of all; communication indeed from person to person, and from one level or layer of one individual's mind to another.

My point is that creativity is not a tune that one can ask the piper to play, for it is a rare piper that has this tune in his repertory. The basic psychology of creativity is only slowly coming into its own today, and it is coming slowly and imperfectly like that of a child whose environ-

ment we do not know how to plan in order to release his greatest potentials. Research on creativity, yes! Let us have it in every form and aspect. But perhaps we shall find that even greater than our knowledge of its inwardness, its subtle, hidden quality, its capacity to erupt in unknown places, most urgently needed is the habit of thinking about the conditions of city life, of schools, of homes, of parent-child communication, which will, with scientific research, become the ecology in which a creative citizenry can grow. And, if this be true, perhaps nothing less than a world ecology for the development of a world pattern of creativity will suffice.

3

Art and Human Creativity

D. L. STACY*

The visual arts of today exist outside of the history of man. They have lost the inter-connectedness that is the basis of creative life. The great power of visual language has always rested upon its function as a probe into areas as yet unknown. Visual images, of whatever nature, have given specific form to the new potentials rising within man. These forms have helped to shape, and make visible, life directions and attitudes which might otherwise have sunk back into the ground of nature. The impulse to expand, develop and enrich life is inherent to man, and the task of bringing forth new images of life is immense and as yet underestimated.

Creativity is still thought of as a peculiarity of personality, rather than as a natural movement within the human system. It is the blood of the system itself. Human consciousness is the great creative gift of life. This gift is, however, not to be taken for granted. Man is really distinguished from other animals by this phenomenon alone, and its function can too easily be lost or impaired. Great effort is required to maintain this awareness of self and others. Each of us can lose this awareness when fatigued or under stress. We become not quite ourselves, wiped out, etc. It is because of the great strain consciousness imposes upon us that we value it so highly. People of "lesser" awareness are thought of as lesser. The dangerous error committed by Western culture is the identification of the whole man with consciousness. Even

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the exclusively bio-chemical view of life can only be held by those blinded by the rational logic of conscious systems. That these systems work in themselves is undisputed. But it is equally obvious that unacknowledged value systems guide this "objective" framework, to the great detriment of the mass of nature that is, and that will remain, unknown. To direct one's awareness is an act of devotion. It is what devotion means. But this is far from seeing life as only that which is in sight.

Creative man makes no such identification. He allows himself to be what he seems to be as well as that which he seems not to be. In short, he is open. This has led to psychological pronouncements about ego weakness, even deformation, in regard to the artist. But these statements come from the rigid positions of orthodox thought. Everyone who lives outside the walls must be "odd" and maladjusted!

Now if consciousness itself is a great burden, if it is realized how much effort it takes just to be aware, then it is to some extent understandable that each hard won conscious position will be bricked-up and reinforced.

Taboo, ritual and culture, are just such concretized frameworks meant above all to hold man in an aware state. Within this context a certain form of life, certain traditional attitudes, religious mores, etc. give unity to a people. Place against this a man who has the strength (or, as seen from within the walls of collective life, weakness) to listen to the voices or see images, numbers, concepts, which are valueless to the fixed society, but which fascinate with their strangeness or their beauty. Along with the normal strain of being aware, more energy is risked in order to give form to these odd and perhaps disturbing inner promptings. The factors involved are largely unknown. They do not fit into the prevailing image of life, the theories of how nature works, what man is, etc. Despite this, the creative man allows the development of these forms, and more, he holds onto his self awareness while reaching beyond that which is known.

Even the word "unknown" is greeted with derision. It is difficult to understand why this and terms like "mystery" are found so horrifying. Perhaps the man who doesn't believe in ghosts is the most afraid! To admit an unknown is simply to admit a limit to the known. This can only be anathema to men who believe they are only that which is known. The rest is like a forgotten name, which will come back any moment. But this is childish. Our great concepts, enormous power, have no creative function. They are impotent before the fundamental demands of mankind.

The creative man knows less than anyone else, therefore all knowledge is foreover new, startling, even thrilling. Knowing less, he is able to penetrate more. Being "outside" he is more free.

Creativity is spoken of everywhere, yet the above was meant to underscore the fact that a true creative attitude is expensive. It costs. Our hard work point of view, based upon highly focused and specialized conscious attention uses great energy, a strength of will. It is fatiguing. If overdone, the focused areas revolt, twitch, cramp and otherwise plead for release. As much strength as this seems to take, it is even more difficult to let the fixed focus of consciousness drop. To allow the inner or outer images and visions float at random, all the while paying strict attention. In this case the center of awareness is placed in jeopardy. It has little upon which to hold. The tight web of known facts which protect and keep united the personal identity of the individual can be broken. One can become lost, or at the least enter a dream-like state that can barely be recalled. A pleasant drowse.

At this point the language of art is essential. The forms of art take the place of the general protective attitudes of a given place and people. And these forms span more time and more space than do present Western cultural traditions, which have lost their roots during the age of "reason". The history of the language of art is an unbroken history of man. It spans the life of man more completely than any other language, and it is more accessible to unprejudiced study. We can imagine the man of the caves reaching an apex in this art, where color, composition, dimension via overlapped planes, tranparency and geometric shapes are all realized. Imagine the spoken language being as well developed! There is no way of knowing what was spoken or how it sounded, but if the visual and oral languages matched in any way, these parents of modern man would have been poets enough to shame the future!

At any rate, the alphabetic forms of art enable the lesser focused and more inclusive awareness to maintain a deeply human connection which acts as a net within which vague and rambling visions can be caught. The artist must put that which captivates and fascinates into a viable whole which can then be shared. It is not a question of communicating to large numbers, but of concretizing that which is otherwise invisible. From these formalized visions the potential movements of life can be sounded. The impass disolves once images from beyond its boundaries are realized. The impotence of awareness hypnotized by its ability to be aware falls off, and consciousness becomes an open door to unending possibilities, protected all the while by the language of form.

It must be understood that all language is abstract, and abstraction is the great tool of consciousness. Even a myth is an abstraction of prototypical behavior. Just as the word "apple", is a substitute in signs and phonetics for the object *apple*, so are planes, color, and volume on a flat surface, abstracted forms indicating the object in a new context. All language is composed of abstract forms, and the cave art of 20,000 years ago is the first consistent record of man's abstract development. These were *human* beings.

Why then has man surrendered to such a degree to the mechanical image of life? Why has art given up its human history? Art today makes "things". It is intimidated by electronic machines. The most advanced of these is but an extension of the least creative part of the mind. It is a midget replica of the sterility of pure consciousness. It only "knows" what it is told that it "knows". It cannot deal with the unknown. To a machine there is no unknown, only programmed reels of tape. Is this an image of any caliber to frighten man? Only if man thinks *he* is such an impotent object can he possibly think in such terms.

The task for creative man is to fathom the depths of all that lies outside the systemized body of knowledge that is so worthless to our present needs. More knowing will not help us. Only a new knowing, a transformed point of view, a new image of man and of the universe which takes into account that which is "left over", "of no value", "only subjective", etc. Value can only be found from a new vantage point. Perhaps from one that is "lower". Creativity demands energy. It is difficult, threatening, tormenting and dangerous. It is not "safe". But its rewards bring new energy, new values and images which can fertilize our dying time. It calls for strength, commitment and a command of language. It does more than solve problems, it presents an entirely new picture of life capable of fascinating and feeding the inquisitive aware mind of man well into the future. This is the transformation we long for. This is the role of creativity today.

4

Creative Potential and the Educational Experience*

SIDNEY J. PARNES†

A PHILOSOPHY OF CREATIVE BEHAVIOR

Arthur Koestler refers to creativity as an "actualization of surplus potentials". When we review the tremendous strides that technology has made in actualizing the potentials of our material resources, it is difficult for us to believe that the development of the most important resource of all—the human one—has not kept pace. Unused material resources, Jerome Wiesner points out, are not necessarily wasted; unused human resources always are.

Education and Mental Health

Failing to use mental resources is wasteful both to society and to the individual himself. In effect, the person who fails to use his potential may become psychologically unhealthy or "mentally ill". We might

* "Creative Potential and the Educational Experience" was presented by Professor Parnes at the Seventy-Fifth Annual Convention of the American Psychological Association on September 1, 1967, in Washington, D.C. In describing the theories and principles underlying many instructional programs for developing creative productivity, Professor Parnes used excerpts from Part I of his *Creative Behavior Guidebook*, copyrighted and published by Charles Scribner's Son (New York) in 1967. Those persons interested in his successful application of his research-based theories are directed to the *Guidebook*, not only for an expansion of the ideas presented here, but for a detailed instructional program, or lesson plan, for guiding students in the practice of increasing productive creative behavior.

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say, even, that the mental health bill of society is made up of the difference between the potential and the operational level of every single person in the population.

A common educational objective is to help each person develop his mind to its fullest potential, to educate him to live effectively in a changing world, to prepare him to institute changes where they are needed and to adjust to those changes that he is forced to accept. Working toward and hopefully attaining this goal virtually assures society of a psychologically healthy membership.

To live effectively in a changing world, one needs to learn to make effective decisions and to act upon them intelligently. When a person makes optimum decisions, he first speculates on what "might be" from a variety of viewpoints; then he senses and anticipates all conceivable consequences or repercussions of the variety of actions he has contemplated; finally he chooses and develops his best alternative—in full awareness.

WHAT IS CREATIVE BEHAVIOR?

From the foregoing discussion, one may deduce that I define creative behavior as that which demonstrates both uniqueness *and* value in its product. The product may be unique and valuable to a group or organization, to society as a whole, or merely to the individual himself. Creativity is thus a function of knowledge, imagination and evaluation. Without knowledge, there obviously can be no creativity. By way of analogy, we might consider the kaleidoscope wherein the more pieces we have in the drum, the more possible patterns we can produce. Likewise, in creative learning, the greater our knowledge, the more patterns, combinations or ideas we can achieve. But as Alfred North Whitehead stressed long ago, education should aim at — "the *effective utilization* of knowledge". The italics are mine. Merely having the knowledge, the bits and pieces in the kaleidoscope, does not guarantee the formation of new patterns. One must "revolve the drum", manipulate the knowledge by combining and rearranging facts into new patterns. In the mind, these new patterns are "ideas".

The effectiveness of creative productivity also depends, of course, on the evaluation and development of embryonic ideas into usable ideas. Without knowledge, imagination cannot be productive. Without imaginative manipulation, abundant knowledge cannot help us live in a world of change. And without the ability to synthesize, evaluate and develop our ideas, we achieve no effective creativity.

Creative Reading

Thus when one behaves creatively, he is basically re-focusing elements of his experience into new and meaningful relationships. Note that the very act of reading, or any form of sensory input, allows for techniques which promote interrelationships or those which promote sheer storage. Throwing new input into fresh relationships with other stored material brings about connections which make for more creative use of the knowledge. As a matter of fact, knowledge "new to the individual" can then be generated, as is exemplified by discovery courses like the new math.

E. P. Torrance and J. A. Harmon (1961) found that students used knowledge more creatively when it was learned with a "creative set" rather than with a "memory set". Students with the "memory set" were more restricted in finding new implications or more applications for the knowledge. Ray Hyman's studies (1964) show that information, as such, may not be as important to creativity as the way one seeks and receives it—as well as how he deals with it. All other things being equal, the more elements in one's experience, the more new relationships he is able to concoct; and again, all other things being equal, the more new relationships he concocts, the greater the chances of his producing a potentially fruitful one.

Tightness and Looseness

General M. K. Deichelman once spoke of the necessity to "stay loose", which is a very vivid way of describing the qualities of the "creative person". The enigma becomes: How loose? How loose can one become before he "falls apart"; and conversely, how tight can one stay before he becomes rigid?

Freedom *with* discipline; young outlook *with* mature judgment—this is the dilemma of "creative man". But it is the mark, too, of what Maslow (1959) calls the integrated individual, whom he describes as follows: "A truly integrated person can be both secondary and primary; both childish and mature. He can regress and then come back to reality, becoming then more controlled and critical in his responses".

Conformity

The creative person cannot be a "blind" conformist. I use the term "blind conformity" to differentiate from deliberate or purposeful conformity.

Deliberate conformity in behavior may sometimes be desirable or even necessary to a creative life, but "blind" conformity in thinking

is demonstrably detrimental to the fullest creative growth. Conformity reduces the likelihood of one's creating the fresh viewpoints necessary to achievement of creative insights. Conformity is thus the enemy of originality and the creative productivity to which novelty can lead us. Yet society tends to mold its members into one conforming being. Its culture is often at odds with creative ideas because these ideas drop like pebbles in a sea of tranquility, forcing changes.

The creed of the creative person might well be borrowed from the old adage that prays: "Give me the courage to change those things that should be changed, the strength to accept those things that should not or need not be changed, and the wisdom to distinguish between the two."

Errors of Omission

When we conform to prevailing norms, we are seldom guilty of an error of *commission*. But what about errors of *omission?* Errors of omission are much less likely to be detected than errors of commission. If I do not act upon an idea which later proves to have been "right", I myself may be the only one aware of my mistake. However, if I act and am wrong, my error is usually obvious to others. Most of us, through fear of some form of ridicule, tend to play the game safe, bringing forth our ideas only when we are sure of their worth and acceptance.

Most people are probably more concerned with meeting each situaion in the same way as they met it before, but making fewer "apparent" mistakes each time, than in finding new, imaginative ways to solve their problems. We let our "unkissed imagination" become our ulcers, as John Ciardi puts it.

Summary Description

To try to summarize the description of the "creative person", I might say that the individual who behaves creatively is oriented toward setting and solving meaningful problems, using an inner drive to recombine his storehouse of experiences in new ways. In attacking his problems, he does not behave as a conformist; instead, he pioneers often, is not afraid to fail frequently, but is productive in the long run.

Thus the individual behaving creatively sees things through many eyes, from many viewpoints. He allows his associative processes to relate freely what his senses bring to him. He is constantly changing his views as he forms new associations, as compared with the "non-creative" individual who freezes his views into rigid ideas which we call prejudices.

CREATIVE INTELLIGENCE

From the foregoing discussion, it becomes apparent that the so-called creative attributes overlap considerably with attributes we expect to find in the so-called intelligent individual. Terms such as "creative intelligence" are tending to replace the notion of creativity *versus* intelligence. Creativity is a part of, not apart from, what we normally think of as intelligence. J. P. Guilford's structure-of-the-intellect (1967) contains 120 known factors, only a small number of which are measured in commonly used intelligence tests. This is the reason for the relatively low correlations that are typically found between "intelligence" tests and "creativity" tests. The latter typically measure factors not covered in the former. Hence, there is need for a broad range of tests if we hope to approximate the total intellectual capacity of a person—i.e., to measure his "creative intelligence." Guilford emphasizes that the person who scores high on creativity measures tends to have relatively high intelligence as measured by IQ tests, but that the high IQ person may be anywhere from high to low on creativity measures; hence, his term "creative underachievers."

Creativity, Intelligence and Achievement

In recent years, much new light has been thrown on the relationships among intelligence, creativity and achievement. It appears that school achievement, as commonly measured, is in general more affected by the so-called intelligence factor (IQ) than by factors measured in creativity tests. However, the research of Getzels and Jackson (1962) with gifted students (average IQ of 132) has shown that the most "highly creative" ones scored just as well on achievement tests as did the most "highly intelligent" ones, even though there was a 23-point IQ difference between the averages of the two groups (those gifted who were at the very highest on IQ tests versus those at the very highest on creativity tests). More important still is the fact that a number of investigators have discovered little or no relationship between academic performance and later professional success.

EDUCATION FOR CHANGE

Creative Teaching and Leadership

Although there is much emphasis on creative teaching (the imaginative use of materials—films, demonstrations, etc.—by a teacher), relatively

less emphasis is being placed on the deliberate development of creative behavior in the student. Teaching in ways that impart information more effectively and in a more interesting manner is, to me, not enough to qualify it as teaching for creativity development. It is the difference between speaking and listening, between expressing oneself and encouraging others to express themselves. Teaching or supervising for the development of creative behavior taps the internal resources of the student through the use of any media that can be made available.

Think of the school situation as a group or organization having a single leader (in this case, the teacher). An organization can be creative primarily in the sense that its leader is highly creative and directs the personnel autocratically in implementing his creative ideas. On the other hand, an organization can be creative primarily because its leader subtly stimulates the creative productivity of the individual members. In the former organization, the main rewards to the individual are apt to be those which are customarily enjoyed *off* the job—salary, vacations, and those benefits that are meted out by the leader—or, at best, environmental and social conditions that an individual enjoys on the job. Primarily, however, the benefits are tangible.

Leadership for Creative Growth

The organization that provides for creative growth of the individual is one wherein the intrinsic satisfactions are often greater than the extrinsic rewards—for example, the sense of contributing a major portion of *oneself* to the job or the sense of self-expression being tangibly rewarded. The individual in this type of organization is too busy applying his creative energies to a job or his studies to watch a clock. He becomes *totally* involved in the tasks at hand. In the process, he discovers himself.

A teacher or supervisor with this goal in mind actualizes his own creative potential, effectively uses his external resources and makes something happen *within* the learner.

Teleidoscopic Action

Perhaps you have seen a teleidoscope. It is somewhat like the more familiar kaleidoscope that I mentioned earlier; however, the basic difference is this: the kaleidoscope makes patterns and new combinations only from what is *within* it, whereas the teleidoscope gets its structure from within but the raw materials for patterns and color from the *outside*, from the changing environment it focuses upon. This perhaps gives an even better analogy of what I am trying to bring out.

That is, there are elements within the structure of a person that are a part of his total being, his total life experience. These are played upon constantly by the external input through his senses. The person's creativity depends, then, on his ability to relate not only what he already has within him, but also that which comes from outside him. Education has the responsibility of developing this relational ability in addition to—not instead of—the ability to fill up the mental bucket with knowledge.

Lack of Emphasis on Imagination

Although teachers show an increasing awareness of the need and the opportunities for encouraging creative behavior, our present educational system to a large extent still overlooks the intentional enhancement of such behavior. Frank Williams (1963) summarizing a variety of investigations, stated that the studies have been consistent in their findings about the frequency of certain behaviors between teachers and pupils. Approximately one-quarter to one-half of the total classroom time was spent in telling students what to do. Another quarter was spent in providing information, much of it administrative. Only five percent was devoted to reinforcement of the students' responses. (Reinforcement for creative responses was almost completely lacking.) In addition, the teachers allotted only about one-and-one-half percent of the classroom time to decision-making functions.

RESEARCH ON THE NURTURE OF CREATIVE BEHAVIOR

Harold Rugg (1963) wrote: "We have had millions of hours devoted to training in solving problems by reasoning, but almost none devoted to cultivation of the imagination." Fortunately, we are finding increasing emphasis today on development of creative behavior—largely because of research findings in recent years. This research suggests that teachers can do two things to enhance the individual's creative potential. First of all, we can help the individual gain an understanding of past influences—his background, experience, habits on his present behavior. We are thus helping him to perceive himself as a creative being and to get rid of *internal* blocks to creative functioning. This perception is analogous to removing a governor from an automobile; the horsepower remains the same but performance increases. Perhaps it accomplishes for the "mentally well" what the psychiatrist attempts for the

"mentally ill" in bringing the individual closer to functioning at full potential.

Environmental Freeways

Secondly, we can provide *present* environmental conditions (in the classroom, on the job, etc.) that encourage creative functioning. We are then removing *external* blocks to creative behavior, just as we might remove road-blocks from the path of an automobile. A driver on a freeway can use more of his car's potential than he can on a narrow, obstructed road; the individual can use more of his potential when he is in a creative climate. Note, however, that the *internal* governor must be removed before the environmental freeway can effect a change in behavior. It is well to add that the individual must learn to be his own governor. He must learn to adjust to a twisty, bumpy, obstructed road when it is *necessary* to do so. Cultural conditioning internalizes this governor, but culture has not done a satisfactory job in teaching a person how to use it with appropriate flexibility.

Deliberate Educational Programs

Research evaluating specific educational programs designed to release internal blocks (as a means of shaping optimum creative behavior) is increasing rapidly. Although the distinction between internal and external blocks may be somewhat artificial, it appears to be a useful way of categorizing these many related studies. Our recent bibliographic search has uncovered over forty studies evaluating programs for teaching students to improve their sensitivity, fluency, flexibility, originality, elaboration and related abilities. These investigations range from the retarded level to the gifted level, and from the first grade through college and adult education. Studies of adults have involved subjects from such diverse groups as military officers, teachers and industrial personnel.

Consistent Findings

Approximately ninety percent of the total number indicate that subjects' creative-productivity levels were significantly increased by deliberate educational programs. A number of informal and unpublished studies include similar findings, so the bulk of the research is quite consistent and impressive on this question.

Subject-Matter Gains

In several investigations the creative-development training was incorporated in a subject-matter course or studied with respect to gains

in normal academic areas. No losses were reported in any subject-achievement levels, and one study indicated gains in subject-matter for experimental students over control students, *as well as* gains in creative productivity (Sommers, 1961). An investigation by Veatch (1953) showed gains in reading when creative activities were part of the training, and in another case (Torrance, 1962) training in creative thinking transferred to creative writing.

Personality Changes

Several investigators attempted to study changes in personality as a result of experimental courses. Changes in the direction of the creative personality are evident in all but one of ten different studies, but they do not appear to be as impressive as changes in ability factors. Only a relatively few researchers have scientifically studied personality aspects, and there appears to be less consistency in their results than in findings on abilities.

Thinking Abilities

Francis Cartier once declared that there is no such thing as creative thinking—that there is only thinking; but thinking occurs so seldom, he argued, that when it does we call it *creative.* A number of the studies in the literature focus on the development of these general thinking abilities, which are required by our definition of creative behavior as involving *quality* as well as novelty of thought. Of ten studies evaluating this type of educational program, seven demonstrated significant gains in general thinking ability, critical thinking, problem-solving, IQ scores, etc., while three were somewhat ambiguous.

Effects Persist

In investigations at the State University of Buffalo, we seem to find a trend to stronger effects with greater exposure; one study measured persistence. Increased productivity, as compared with that of control students without training, was measured in subjects who had taken a creativity course from eight months to four years earlier. In a study evaluating training in the arts, Miles (1963) found persistence in a change of aesthetic attitude five months after training.

Conclusions

Insofar as existing tests adequately measure creativity, the evidence indicates that creative productivity can be increased. A few studies further demonstrate transfer effects that extend beyond the existing

tests. However, the validity of training creative behavior will be more firmly established when additional evaluative studies are designed to measure gains against ultimate criteria such as job performance. One study (Simberg and Shannon, 1959) has already shown significantly greater gains in quantity and quality of suggestions by trained groups, as measured by dollar awards, when compared with an untrained control group in the same suggestion program.

Need for Additional Studies

Further research seems to be most needed in determining transfer effects, in longitudinal studies to confirm persistence effects, and in determining personality effects. The need also appears great for designing and carrying out a full-scale evaluative experiment that would utilize and integrate all the known approaches to the development of creative-intelligent behavior. Guilford's *Structure-of-the-Intellect-Model* might provide the theoretical framework for such an experiment.

Tested Programs

It appears that some people have experiences that develop their facility in intellectual processes associated with creativity and intelligence. Research seems to demonstrate that we can design educational programs for many of these experiences, rather than merely waiting and hoping for them to happen. Actual incremental programs, experimentally tested, are already available at the first grade (Anderson, 1965), sixth grade (Olton, 1966), and twelfth grade or adult levels (Parnes, 1966).

Coordinated Program Needed

The need now is to develop educational programs for *all* mental abilities instead of the relatively few that have recently been experimentally tested. These materials could then be developed into a coordinated training program in creative-intelligent behavior from the kindergarten through graduate school.

ENVIRONMENTAL CONDITIONS AFFECTING CREATIVITY

Reinforcement Increases Creative Behavior

There is usually a large gap between an individual's creative potential and his creative productivity. The deliberate educational programs

I just mentioned can help close the gap. Research appears to show that an environment which asks for creative behavior and rewards it helps also to close the gap. Such a climate encourages individuals to actualize their creative potential. Making people anxious or fearful of their ideas, or restricting their ideas, will usually lead to less creative behavior.

The Same Name for Different Things?

It is very difficult to determine the meaning of research terminology like "permissive" and "directive" teaching, or "low-controlling" and "high-controlling" teachers. Some studies may evaluate the same variables, but major differences certainly exist in the types of teaching or supervisory procedures called by various names, or even by the same name, by different investigators. If we can generalize, however, to the notion of "open" and "closed" teachers or supervisors—idea-seeking persons and those who categorically give all the ideas and information—then the studies do appear to offer convincing evidence that the former type of teacher or supervisor (or the environment he creates) is significantly more conducive to growth in student creative behavior. In a few studies cited, the results of evaluative research are unimpressive or equivocal, so that some investigators are reluctant to generalize (Wodtke and Wallen, 1965). The trend of these studies, however, does seem to favor the open type of teacher or supervisor.

Deferred Judgment

Many studies have evaluated the efficacy of the specific principle of deferred judgment as a means of releasing creativity. This principle calls for deliberate deferment of judgment during idea-finding in order to prevent premature judgment from hampering imagination. Judgment is applied only after a wide variety of alternatives are listed. This principle may be used by a single person thinking independently or by a group. When used by a group, it is popularly called brainstorming.

Arnold's Thesis

Some time ago John Arnold wrote a short piece explaining how deferred judgment might be used by an individual, a group, or an organization. Arnold's broad conception of deferred judgment suggests that research on environmental variables might be studied with this focus, and the literature seems to support his thesis. Arnold's idea seems implicit, although not always explicit, in many of the studies regarding general environmental factors affecting creative behavior. Deferred judgment (*postponed*, not *eliminated*) is a broadly applicable set which

tends to provide the kind of climate that is conducive to creative behavior. Furthermore, according to a study by Johnson and Zerbolio (1964), practice in production of ideas improved judgmental ability, while practice in judgment did not improve either idea-production or judgment.

The Recent Wallach-Kogan Study

The study by Wallach and Kogan (1965) indicates that highly intelligent but rather non-creative subjects have a disinclination, rather than an inability, to use their imaginations. The subjects were reluctant or fearful of being original, rather than unable to be original. This finding is substantiated by a study of creativity and hypnosis (Bowers, 1965), which investigated the hypothesis that many people have a potential for higher creative performance which is blocked from expression by defensiveness. The hypothesis was confirmed. Such research supports the notion that individuals have ideas but are reluctant to express them or even to consider them unless we provide an environment that gives them a mental set different from their habitual set. We must provide either explicitly or implicitly a psychologically secure and free environment.

Extended Effort

Related closely to the deferment-of-judgment principle is a theory that extended effort in producing ideas on a creative-thinking problem tends to reward problem-solvers with a greater proportion of good ideas among the later ones on their lists. My report on studies in extended effort (Parnes, 1961) discusses this in greater detail. Two reports from the University of Michigan support the extended effort theory and its implicit deferred-judgment principle. In one of these studies, immediate solution-mindedness was hypothesized to interfere with effective problem-solving. Hence experimental subjects were given instructions designed to lessen the likelihood of immediate acceptance of an obvious solution, and therefore to increase the likelihood of consideration of numerous alternatives. Under these instructions, experimental subjects produced over three times as many solutions of superior quality (Maier and Solem, 1962). Another study showed the value of deferring and pressing for a second solution (Maier and Hoffman, 1960).

Summary

To summarize the research regarding deferred-judgment, all but two of fourteen studies at a variety of institutions have shown that more

ideas and more good quality ideas are produced by subjects when using deferred judgment than when following conventional-thinking procedures. In the two exceptions, neither procedure was superior. In a fifteenth study, the results were ambiguous.

One further exception is interesting. All research I have reviewed on deferred judgment used college students or adults as subjects. Two other studies are reported at the elementary level. In both cases, no differences were found between deferred judgment and conventional thinking (Torrance, 1959; Cartledge and Krauser, 1963). As we have all observed, young children will produce original ideas whether encouraged to or not. They have not yet learned to fear their ideas as adults do.

Balanced Growth in Children and Adults

We have all observed youngsters whose originality is boundless as well as, at times, reckless and dangerous. On the other hand we all know adults whose originality has been reduced to sterility. Somewhere between these two extremes is the truly creative person. Deferred judgment frees the adult from anxieties about his ideas, and thereby results in greater release of creative potential. In the relatively uninhibited child, this release is evidently more natural. The internal governor has not been fully established. The same studies with children have shown, however, that even first graders can be taught other procedures which affect their awareness and their associative processes, and thus bring about an increased production of original ideas.

All studies to which I have referred are included in a complete summary of research on the development of creative behavior in the *Journal of Creative Behavior*, Vol.1, No. 1 and 2, 1967.

FACILITATING THE CREATIVE PROCESS

Deliberate Methods

We are familiar with the phenomenon of a "flash" solution that occurs when we are detached from conscious attention to a problem—that part of the creative process termed "incubation." Yet not everyone is aware that new fruitful associations can be *made* to occur while we are consciously attempting to work out a problem solution. In other words, deliberate methods can be used to release the latent creative power within individuals—to put the student in better communication with himself. And practice with these methods can translate mere under-

standing of them into appreciation and accomplishment. These assertions are supported by the theories and research findings I have discussed.

Two General Approaches

The creative process, to reemphasize in simplest terms, might be described as the fresh, meaningful association of elements from our knowledge and experience. Hence, the fundamental purpose of a program to nurture creative behavior is to facilitate the effective use of a person's associative abilities. An individual can increase the number of his associations in two general ways: (1) feed his brain the fuel required for it to operate at full capacity and (2) remove the brakes that stop his associate mechanisms from functioning naturally.

Required Fuel

The fuel for our associative mechanisms is the sensory impressions we bring to our brain. The more data we supply the brain, the more interrelationships it can create. However, the quality of associations is dependent on both the quantity and richness of input. Therefore the development of acute awareness and sensitivity is an important aspect in the cultivation of creative talent. This includes the ability to discern relationships that are not readily obvious or apparent. It implies the development of a wide curiosity that will increase the likelihood of discovering connections between remote fields or areas of interest and activity; the more *seemingly* remote the relationship, the more the likelihood of originality in the idea.

Removal of Brakes

The removal of brakes relates to the variety of blocks mentioned earlier as both internal and external impediments to creative functioning. Basically the elimination of these blocks is accomplished by providing the individual with complete freedom for mental exploration. What is being done in creative problem-solving programs is placing the individual in an environmental setting which allows for complete self-acceptance. This includes not only freedom from concern for the reactions of others, but also the willingness to defer his own judgment of his ideas during the exploration process. Furthermore, to use psychologist L. L. Thurstone's terminology, we show him the value of "inhibiting his impulse" to act on his first idea.

Creative Climate

The basic framework of a creative education program provides the environmental turnpikes on which the individual can travel once he is released from the governors which have held back the flow of his raw imaginative processes. He can travel on his own "mental library" and his own "mental machine shop."

INCUBATION

At this point it is important to consider the phenomenon of incubation in relation to conscious processes. The mental process described above can be facilitated consciously and deliberately. As we focus upon a problem and search for ideas, we may consciously defer judgment and allow full flow to our associative processes. Or the associations may occur in the preconscious, before awareness, as during incubation. In a sense, the deliberate, conscious efforts at making fresh associations may be considered an attempt to replicate what seems to be the unconscious or preconscious phenomenon of incubation; for incubation enables our minds to attend to items of our past experience while we focus consciously upon other items in our present awareness. Links may thus be formed which are overlooked when we search consciously for relationships. The conscious mind is limited in the number of ideas it can attend to at one time. Subconsciously, however, the mind is capable of much additional activity.

Incubation and Deliberate Processes

Since we cannot observe the unconscious, it seems very mysterious and unexplainable to us. Therefore, I have tried to explain to myself the phenomenon of incubation by relating it directly to my earlier comments as follows: An individual attempts to make as many relevant associations as possible to the problem at hand. He feeds his associative mechanisms the best fuel for optimum operation, and he defers judgment so as to "remove the brakes." In a sense, incubation is related to both of those endeavors. In order to allow for what is called incubation, the individual must get away from direct involvement in the problem for a period of time. By thus detaching himself, he has, you might say, deferred judgment or closure on the problem. As the problem "simmers" in the back of the mind—"on his back burner"—he attends to other things and allows his senses full play upon his total environment.

With respect to consideration of the problem, it might be reasonable to suppose that the person is in a sort of hypnotic state; that is, he has given himself the suggestion to work on the problem and has then put it out of his consciousness. All input from his environment bombards the fringes of the problem. Suddenly one element connects with an element of the problem and triggers it up into momentary awareness. Perhaps this occurs in much the same way as a very remote association is suddenly formed when one consciously attempts to produce ideas under referred judgment. But note that the idea would not occur if the elements needed for the connection were not implanted in the mind prior to incubation. Without the requisite links in my mind, I could be bombarded with apples while under a tree yet never come up with the law of gravity.

PRACTICE ELEMENT

With respect to all that I have said, the practice elements seems to be crucial to cultivating creative behavior. Understanding intellectually the principles and theories I have discussed in regard to creative behavior is a different matter from effectively internalizing them. Attending a lecture *on* physical education is not the same as attending a program *for* physical education. Likewise, studying creative behavior to understand it is quite a different matter from practicing it. Hence, almost any program designed to nurture creative behavior will of necessity provide practice in applying the principles I have discussed. Jerome Bruner (1960) claims, "It is my hunch that it is only through the exercise of problem-solving and the effort of discovery that one learns the working heuristic of discovery."

Experience Doubled Output

Courses will typically provide a good deal of practice in deferring judgment, in playing with ideas and forcing new relationships, in alternating between involvement with and detachment from the problem. Striking evidence of the value of such practice experience was provided by a comparison study of novices and those experienced with the use of deferred judgment at State University at Buffalo. Even though both groups were given the intellectual set to defer judgment, relate freely, strive for quantity of alternatives, etc., the experienced subjects, equivalent in all other respects to the naive group, out-produced the novices (in the same length of time) approximately two to one on both quantity

and quality of ideas in solution to a problem. The results were highly significant statistically.

Knowing versus Doing

Furthermore, I feel that it may be more than a matter of the sheer practice that increases one's creative ability. I question whether a person can fully understand—fully appreciate—the meaning of concepts like deferred judgment until he internalizes them. As Wallace Andrews, an instructor of creative problem-solving courses, says, "You can learn all you want to about Freud, but sooner or later you have got to go out with girls." Knowing and doing are two different things.

Resist Change

Moreover, when unaccustomed to it, the person may find strange and uncomfortable the type of thinking that is required for maximizing the uncommon associations in creative thought. He may have lived too long in the cultural cocoon. Ashley Montagu once quipped that all man wants nowadays is a womb with a view.

A PROGRAM FOR NURTURING CREATIVE BEHAVIOR

One instructional program which follows the theories, research findings and underlying principles I have discussed has been developed by the Creative Education Foundation over a period of years at State University at Buffalo. After a number of years of informal experimentation and development of course materials, more formal research began in 1957. From then until 1963 the material was refined, tested and constantly revised in a wide variety of college and adult classes. It was then subjected to a three-year period of experimental programming research, which resulted in the development of better sequencing and presentation in order to allow for optimum understanding and performance by the student. Performance, of course, is a key word here, inasmuch as the course calls for repeated practice in creative functioning under an exemplary climate for this type of behavior. Growth can thus be observed and measured as the course progresses.

Approximately 700 students (adults, college undergraduates and high school seniors) were involved during the last three-year series of six major revisions. The changes were required as a result of research into student ability to cope with the course materials during self-study.

The results finally demonstrated that the revised material could be adequately understood and successfully followed by students working alone. The detailed testing called for students to write out their ideas at every place where the present course calls for classroom responses or discussion.

After the described evaluation, the material was then used as a detailed instructor's manual by instructors who taught students creative problem-solving in a normal classroom situation. That is, the instructors spoke the portions that the students had read when studying alone, and asked the students to respond aloud most of the time rather than to respond always in writing (as in the self-instructional version). Furthermore, opportunity for interaction was allowed among students and instructor in the regular classes, although the instructors, for research purposes, did not deviate in any way from the material in the manual.

The results of evaluative research showed that such an instructor-presented course was more effective than the same course taken by the student as a self-instructional program, but that both increased creative behavior significantly. Furthermore, the self-study students did not enjoy the course nearly as much as did the students of the instructor-taught program. However, even though the instructor-taught students found the course more interesting and felt they gained more from it, both groups increased their creative behavior significantly and, in their total comments, appeared to report equal application of what they had learned. Both seemed also to feel that they would apply it equally well in the future.

The course materials are now available in the *Creative Behavior Guidebook* (Parnes, 1967) with a variety of suggestions for their use in academic subjects, in separate creative problem solving courses, and for self-instruction by groups of students or by individual students.

CONCLUSION

Automation and Education

In conclusion I would like to point out the relationship of deliberate emphasis on the cultivation of creative talent to the whole question of automation and what is happening with our increasing leisure time. When I hear people bemoaning the fact that automation may swallow up jobs, I understand the short-range problem but am frustrated because of the overlooked opportunity that is provided for education to

become life's primary purpose. If we could expose people from "cradle to grave" to the kind of educational process where they are accustomed to tapping their own resources, then everyone might experience the excitement of intellectual inquiry throughout life. The more we could then automate, thus freeing people to experience this, the more exciting and meaningful life could become for everyone.

Excitement of Self-Discovery

It seems that "self-discovery" can become the prime *raison d'être*. If we can develop a kind of creative education which provides its own reason for being, its own self-stimulation, then the person's entire life could be built around the intense desire to learn. Just as the research scientist finds the process of discovery on the fringes of knowledge to be such a source of excitement and self-fulfilment to him, we may be able to provide the same self-realization for everyone, at his own level, through a new kind of learning. Life would then be one continuous creative experience, a flowing and a merging of what we have with what we absorb, providing fully for what Maslow calls "self-actualization."

When someone once asked Leonardo da Vinci what his greatest accomplishment was, he replied, "Leonardo da Vinci."

PART TWO

MAN AND ENVIRONMENT

5

Reverence for Natural Systems
A Social Ethic for the Age of Mankind

ERVIN LASZLO*

I

Humanity is at cross-roads. We can set forth our traditional activities and pursue our accustomed goals, or we can set out on new paths, using our creative imagination, restrained by reason and experiment. We can either come to a new assessment of mankind's role within the natural order of things, or very likely face extinction. This is the choice before us. I shall not debate which of these courses is the right one: I hold this to be self-evident. What I would like to do is to outline those ideas which can guide our steps in seeking a new order, in which man does not exploit nature, but fits himself into it for the benefit of all concerned.

Ideas become a material force, Marx said, when they take hold of the minds of men. He was right in this: without ideas that people can believe in, no purposive goals can be pursued on the larger level of social action. Thus what we need today is a new morality—an ethic which does not center on individual good and individual value alone, but on the adaptation of mankind as a global system, to its new environment. We are dealing with emergent realities; no longer with isolated groups of men, but with a systemically interdependent global community. It is this level of analysis which we must keep before our eyes

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if we are to inspire large-scale action designed to assure our collective—and hence also our individual—survival.

Sociologists have clearly recognized the importance of decision-making elites in society, and of the theories which dominate the minds of these groups. In the last resort it is some model of the world—a world-view or "ideology"—which, explicitly or implicitly, guides the processes of social change, when traditional modes of thought and patterns of behavior break down. Hence it is of paramount importance to advance a social ethics today, capable of taking hold of people's minds and, through their minds, guide their decisions in matters of large-scale policy.

The importance of social ideals can hardly be overestimated. They can make the difference between victory and defeat in war; they can prompt heroism in the face of overwhelming odds; they can cancel out the accumulated weight of centuries of tradition. Witness the Arab-Israeli and the Vietnam conflicts; the rise to power and achievement of the Bolsheviks in the early years of the Soviet republic, and the accomplishment and victory of the Chinese Reds under Mao. To fight without a social ideal is to surrender to defeat before the test: the question "why do I fight?" must have a clear-cut and acceptable answer.

And fight we must. Not one another, but *for* one another. Not with violence, but with perseverance and courage. The fight is not for national victory, of one people over another, but for the persistence of the kind of life which we call human and which incorporates our finest traditions and achievements. This is not a fight *against*, but a fight *for*. And it can be lost just as readily as any fight against an enemy. Defeat here will be marked by the downfall of human civilization and its replacement by a form of existence at which we can only shudder. It may be the anti-society of maximum regimentation described in Orwell's *1984*, or an uncoordinated, aimless physical survival in a state of near chaos. Victory will signify the continuation of civilization as we know it, with material and spiritual resources available to all. The difference will be between an outprogrammed set of social systems, unable to cope with the challenge of the new environment, de-differentiating or else maintaining itself by freezing its misfunctioning institutions into bureaucratic rigidity, and an adapted *global system* of mutually symbiotic societies, mapping the new conditions into its institutional structure and dealing with change through constructive reorganization.

If this fight is to be won, we need an orientation for action. It must inspire as well as guide. It must say what is at stake, and what we can

do about it. And also, that it is worth doing. I suggest that such a social ethics can be keynoted by the ideal of a *reverence for natural systems*. In the following I shall outline what I mean by it.

II

The earliest systematic speculations of mankind regarded the universe as a creation of order out of chaos, and saw man's role as fitting himself and contributing to the order. The relation of man and nature was conceived to be a harmonious one, with man exemplifying in his science as well as art the beauty and rationality of all natural things. However, such noble thoughts were quickly extinguished in the first flush of success in *manipulating* nature. Like a child, who first discovers that he can make things do what he wants, rather than having to conform to them, man set about exploiting nature with all the means at his disposal. And modern science fathered technology and provided gigantic means for using nature. Man used nature for all he could get from it. He even produced self-justification for it, in holding nature to be brutish or dumb, and man endowed with intelligence, a sense of justice and goodness. "No one", said Mill, "either religious or irreligious, believes that the hurtful agencies of nature, considered as a whole, promote good purposes, in any other way than by inciting human rational creatures to rise up and struggle against them." And he added, "All human action whatever, consists in altering, and all useful action in improving the spontaneous course of nature." Man must be perpetually striving to bring nature into conformity with his own "high standards of justice and goodness."[1]

What supreme arrogance! What *folie de grandeur*! No man realized the extent of the mistake until today when our attempt to bring nature up to our own "high standards of justice and goodness" threatens to pervert its order to an extent which precludes our own existence. The use of nature for our egoistic ends had far reaching consequences in altering the relationships which form the preconditions of our very being. These relationships took millions of years to evolve and they could only evolve in balance, for any imbalance would have had to be either rectified, or result in disorganization. Thus if there is organization in nature, it is because it could not have been otherwise, given the thermodynamically improbable, fantastically coordinated and delicate nature of the entities that make up our environment, including ourselves.

Now, human knowledge is not a passive process; it is an interaction of knower and known. Fallacious knowledge is self-falsifying in that the resulting course of the interaction will disconfirm the assumptions. Sometimes, the disconfirmation is drastic, as when a rabbit mistakes a rattlesnake for a twig. Sometimes it is both disastrous and takes many generations to manifest itself, as when man believes that nature is brutish and dumb and can be made to subserve his own superior standards of justice and goodness. Knowledge which exhibits nature as a balanced sphere of delicate interdependencies in which man is a part, likewise interacts with the known—nature itself—in guiding man's objectives and hence his destiny. Man's hope lies in the fact that such knowledge will prove to be self-confirming.

Nature appears to constitute both a series of self-evolving morphic phenomena, and a series of disorganizing entropic processes.[2] The morphic processes result in two principal types of hierarchy: the astronomical (galactic clusters-to-planets), and the microphysical-bio-sociological (atoms-to-ecologies) hierarchy. Little is known about the initial conditions and the evolution of the astronomical hierarchy except by speculative cosmogonies fitting mathematical models to the sparsely available observational data. More is known of the building up of the latter hierarchy, with systems on most levels readily available for observation. It now appears that systems within this hierarchy are "programmed" toward self-maintenance in their medium. Thus there is one intrinsic value for all systems, and that is survival: the maintenance of their particular structure under the conditions prevailing in the medium. But when many systems are compresent in a medium the character of the medium changes. When any system adapts to its medium it *ipso facto* adapts to the other systems in it. Hence the medium itself becomes ordered, as the many adaptive systems conjointly form suprasystems. A successively built up series of systems and suprasystems constitutes the atoms-to-ecologies hierarchy as such.

Systems are components in hierarchies. In another sense, hierarchies are systems and each system is itself a hierarchy. The statement is confusing only if approached with the wrong conceptual equipment. There are serious scholars who debate today whether there are both individuals *and* nations, or whether nations *are* the collections of individuals comprising them. The confusion is similar to the one which would result if we asked whether there are both particles and atoms, or whether atoms are collections of particles. The question is wrongly posed in terms of the alternatives of traditional logic. For, in one sense there are individuals *and* nations, for the properties of nations are not

reducible to the properties of individuals. Similarly, there are atoms *and* particles, for the properties of atoms are not reducible to the properties of particles. The "and" is inapplicable only if the world is viewed as a summative, mechanistic aggregate. In such a world, particles jointly *are* atoms, and individuals jointly *are* nations. Such is not the real world of experience, however. Systems are not equal to the sum of their parts, and consequently there are the parts and there are the systems which they jointly constitute. But, in another sense, the "and" is misleading, for systems are not something separate from the parts, but their joint product. There are no nations *apart from* collections of individuals and no nations *apart from* collections of particles. Yet it is still true that nations are not merely collections of particles. One makes a mistake in looking at any natural entity as a thing in itself and asking whether it is identical with, or other than, another thing.[3] In one perspective, each thing is a whole that is more than the sum of its parts, and in another it is a part which constitutes a superordinate whole which is more than many such parts added together. The entities have two aspects: "the functional units on every level of the hierarchy are double-faced as it were: they act as wholes when facing downwards, as parts when facing upwards".[4] The "Janus-faced" entities appear as parts when an analyst identifies himself with their particular level and inquires into their external relationships. Such identification is always arbitrary, for it regards relationships that exist between the entity under examination and other entities in its environment as external. Yet, in the perspective of the higher level, the same relationships may appear as internal relations in a larger whole. Nature does not take sides: it never acts from the standpoint of entities at given levels. If there is anything that is truly evolving in nature it is always the total structure—the largest suprasystem—in which all other systems are components. It is that system which imposes constraints on all subsystems; these constraints can only be understood in relation to that top-level system.

The norm of nature, if we can discern it, is not the existence or demise, presence or absence, of any particular entity *per se*. It is always a set of relationships in which given systems are relata. Nature builds role-structures (to use Boulding's term), not particulated individuals. The particular exhausts its significance in its relation to the structure. The norm, ultimately, is given by the highest suprasystem: the hierarchy. In the case of our species, it is the hierarchy constituting the biosphere. It is that hierarchy which is the significant resultant of millions of years of piecemeal evolution, and not any particular individual

or species. This, I believe, is a lesson to be learned from the slowly emerging new knowledge of our age. It is a lesson which must be learned fast, if the pupil is to survive until his graduation.

Evidence for the above assumption can be restated here under two general headings: (I) evidence concerning the subordination of individual to collective welfare and survival in an intraspecific collectivity, and (II) evidence concerning the subordination of the welfare and survival of the collectivity to that of an interspecific atoms-to-organisms cycle of existence.

Under (I) we may mention the gradual submergence of isolated individuals in increasingly socialized communities as a concomitant of evolutionary development, and the consequent dependence of all individuals upon the collectivity. Although here, too, there are exceptions, they are rare among species with nervous systems sufficiently evolved to communicate with one another: integrated societal organization, as Mather affirms, is commonly displayed among vertebrate animals other than the more primitive members of this phylum.[5] Organization among them may be either for procuring food, common defense against predators, safeguarding common territory, or for constructing shelters. Cooperative organization in its many forms (symbiosis, parental care, etc.) places definite controls on individuals at the same time as it confers benefits on them. One member of a collectivity becomes dependent on others and cannot pursue its own goals to the unconditional detriment of the rest. Individuals may even be sacrificed for the good of the collectivity—as in the case of lion cubs which do not get to feed until their elders are satisfied, or of insects which die when their social function has been performed.

Evidence concerning (II) includes the various cyclic processes, such as the carbon and the nitrogen cycle, which interrelates atomic and chemical compounds in the soil and air with biochemical substances processed in plants and animals and, using all products without surplus and waste, recycles energy in forms usable by all systems within the biosphere. The whole of nature, Sears suggests, can be conceived as a self-repairing, constructive process representing a type of equilibrium that "approximates an open steady state".[6] There is ample evidence for regarding natures multilevel hierarchy on earth as a self-maintaining system—a giant suprasystem in which all non-random, structured entities are subsystems, from atoms to ecologies. The checks and balances which maintain the equilibrium of the hierarchic suprasystem are particularly striking when they impose constraints on animal behavior. Traditionally, basic drives and motivations were thought to

be egoistical, or having at the most the good of a collectivity or a species as their goal. But recent evidence indicates that there are constraints built into the very constitution of individual organisms which prevents them from upsetting the balance of the suprasystem in which they live. The most publicized of these checks is the natural regulation of animal numbers when a favorable confluence of factors has led to unusually large populations; here lemmings, snowshoe hares and some species of shrews are the prime examples. Some species (such as mice) abort their offspring beyond the normal population density, others inhibit sexual acts or produce states of overexcitation and stress leading to drastic reduction in population size. It is now becoming evident that individuals and species do not pursue even their basic reproductive goals at full independence, but manifest restraints whereby they keep within the bounds of balance in the integral ecology of nature. Adaptation in a natural system means the presence of constraints which make its behavior consistent with that of the whole in which it finds itself. The constraints appear as quasi-miraculous phenomena of coordination only as long as we look for their explanation within the systems themselves. Their solutions lie on the next level, in the constitution of the suprasystems which the systems manifesting the constraint jointly form.[7] From that level, the constraints appear as laws of organization of integrated and interdependent parts. The precision with which DNA codes cell production in the organism boggles the imagination when viewed on the cell-level and resolves itself to functional laws of physiological organization on the level of the total multicellular organism. Molecular biology investigates the processes on the cellular and subcellular level and provides, in Commoner's words "important but increasingly futile attempts to reach the beautiful simplicity of biological principles through the laborious, tortuously complex, accretion of concepts derived from experimental systems in which the ordered structure that is the source of this simplicity has been destroyed".[8] The total organism viewed as an integrated whole provides simpler and more coherent laws than the biochemistry of molecules and cells. Likewise, the amazing checks on the size of populations, built into the anatomy of the different species and coming to expression in a multitude of complex, hardly understandable ways, resolve themselves into relatively simple laws of ecology when investigated in the holistic context of inter- and intra-species relationships in a habitat.

The complete futility of attempting a "reductive" explanation of systematic processes on the lowest level of the parts would be illustrated in an attempt to envisage the complexities of urban socio-cultural

existence on the level of quantum mechanics. Calculating the constraints on the atoms in the nervous systems of persons in New York City, an interbreeding as well as "interthinking" (Simpson) population and hence a functional multi-atomic suprasystem, are beyond the capacities of the largest imaginable intelligence, natural or artificial. Yet urban sociology handles the problems relatively well, in terms of statistical laws applicable to the highest level whole in question, namely the city itself.

The conclusion I derive from this is the following. Adaptation in a system on one level is coordinate functioning in the system on the next. Value correlates with states of adaptation for systems on their own level and with the functional stability of the suprasystem on the highest level. Nature builds hierarchies by adapting parts in wholes, and the wholes as parts in superordinate wholes.[9] Thus nature's norm is the optimum functional structuring of the hierarchy: the highest suprasystem in a given environment.

Now, all systems within the biosphere manifest constraints whereby they respect the laws of the hierarchy. Only man has upset the balance by overstepping the bounds and favoring one type of subsystem—*homo sapiens*—over others. Doing so has resulted in the proliferation of his species over the face of the earth, and his control over other species and processes. For some fifteen thousand years the harnessing of fire, water, and later of steam, coal, and now nuclear power, and the exploitation of other species of organisms, plant as well as animal, for man's own purpose, interfered with the organization of the earth's supremely but delicately balanced ecosystems but did not disadvantage his own existence. These processes are cumulative, however, and they are accelerated by modern technology. It is our misfortune to live at a time when the accumulated effects of man's arbitrary recycling of nature to his own ends begin to tell and to cut into the survival potentials of the species itself. Our "natural sins" are not new—new is only their acceleration through our egoistical use of technology and the feedback of effects in the form of a survival threat. Ever since man recycled a bit of the natural hierarchy by planting a crop in one place and depositing his wastes in another, he has been working for his own immediate advantage which now, in the long run, turns into his own general disadvantage. Viewed from this awesome perspective, cultural and social evolution, the pride of mankind, appears as a tremendous blunder—an egoistical boomerang. But it is too late now to undo the work of the past hundred years, not to mention that of the past fifteen or twenty thousand. Rather, we must try to recognize the effects of having over-

stepped the limits and transgressed on the checks and balances of nature and correct our future activities in the hope of reducing the margin between human survival and human technological-social development. We can do this, if at all, only through the use of reason. It is a faculty which evolved in function of assuring man his place within the order of nature and which man, in his subsequent egoistical overconfidence, exploited for his own use. But we have misused our reason long enough; we must now start using it not against, but *for* the natural order.

Albert Schweitzer called for reverence for life. On this basis we must call for reverence for the level-structure of the microhierarchy, including all systems on all its levels, from atoms to an emerging planetary culture, economy, and ecology. We can express the recovery of our implicit natural values in requesting a *reverence for natural systems*. It is a reverence for our own kind, when our vision is wide enough to see ourselves not only in our children; family and compatriots, and not even in all human beings and all living things, but in all self-maintaining and self-evolving organizations brought forth on this good earth and, if not perturbed by man, existing here in complex but supremely balanced hierarchical interdependencies.

III

In the rapid success of manipulating nature we have come to esteem bits of knowledge more than encompassing insight. To know more than is called for in bringing about an immediate goal does not pay; it can be safely disregarded. We have come to look at man's relation to nature as that of a child to his toy; you press here if you want it to go, and there if you want it to stop. But nature is not merely an object to manipulate by limited willful experiments. It is an interconnected, ordered network of events in which every "button" is connected to every "function". And while this in itself is an assumption, it is one which we must make if we are to stabilize our roles not merely vis-à-vis, but *within* nature.

There is beauty in such an assumption. Order is the highest ideal of the human mind: order in thought motivates science, order in feeling inspires art, and order in the course of human existence is a mainspring of religion. The ordered is the meaningful, the knowable. The chaotic, the nonrecurrent is the puzzle and the source of anxiety. It is the element to be reduced to order by action or by discovery of overlooked ordered aspects. But order, if stolidly repeating and unrelieved by novelty,

is boredom and stultifying the mind. Such are simple orders, merely given, unchanging, stubbornly present. Such, however, is not the order of nature. It is a dynamic order, of ever renewing patterns, of novelty, of creativity. Yet it is order, for the events are not haphazard but follow their own inner logic. To discover that logic is the great adventure of the cognitive mind.

The order of nature, as we are now coming to appreciate and recognize it, is the best source of inspiration of social morality we can have. Nothing man-made can compare with it. The starry heavens above and the morality within were what amazed Kant, and we must establish the connection between these two. The starry heavens, as indeed all nature, is not the mechanical, soulless machine imaged by the Newtonian conception. The moral agent confronting it is not its spectator, passively marvelling at its workings. The agent here, and nature all around, are part of one embracing network of dynamic, self-regulating and self-creative processes. Marveling at nature is marveling at oneself, for although there may be others like us in the vast reaches of the cosmos, we surely are one of the most remarkable examples of dynamic order brought forth in this universe. To know this is to admire the matrix out of which we arose, and to want to preserve what we are. We do not need elaborate fantasies or tales of legendary creation. The panorama is before our eyes: wherever we look we see creative novelty arising in ordered sequence out of a prior template or generative matrix, as system obeys system and coacts with vaster system, in autonomous yet symbiotic patterns of functional behavior.

To be part of nature is to have a reason for existence. To be one of the most evolved systems in nature *is reason* enough for self-confidence and the wish to live and propagate. We are not alone: we are in nature. We are a part of the tremendous Chinese-box hierarchy which distributes roles and values to all things, from atoms to international federations. To live and to propagate ourselves we must safeguard both the atoms and the international federations, and all things in between, to the best of our ability. For we do not live and propagate *on* them or *in virtue of* them, but *within* them in multiple ordered relationships.

"Reverence for natural system" expresses this insight. It gives explicit form to an attitude which already pervades the mind of today's younger generation: this is evident in its insistence on universal and more meaningful human interrelations, closer ties with nature, the abolition of egoistic, materialistic values, and the bringing about of a communal society based on love and mutual understanding. This mentality is no longer Baconian: it is not mechanistic, manipulative, and

exploitative of man and nature. It is more akin to the pantheistic cosmic religions of the East, in which, indeed, there is renewed and intense interest.[10] But young people need not trust to the intuitive insights of ancient religions to find expression for their inherent modes of thought. Contemporary western "hard" science now gives them the concept of an interdetermined, multidimensional systems-universe, and this concept is more reliable as a guide for action than any doctrine of intuition, however profound.

If reliable guidance is sought for concerted action, contemporary science can be as relevant, and a lot more trustworthy, than ancient religion. Recent theories, which treat systems in nature as interlinked, autonomous yet coacting wholes, accord essentially with the largely unexplicated, instinctive world-views of the new generation. To the young people who now reach intellectual maturity and upon whose shoulders must rest the responsibility for guiding mankind through the crises of the coming decades, we can leave an ethical heritage in the form of a reverence for natural systems, based on the most reliable information we have, of man and nature alike. The young generation is ready to understand and appreciate this universal natural ethic as more than an intellectual abstraction: many young people already *live* such an ethic, without knowing it. That they do is the hope of the human future and a sign of the remarkable, though often unconscious, adaptive capability of human beings and their societies. And this capability can be vastly enhanced by explicit theoretical formulations, for it is around such general and yet concretely meaningful principles that concerted patterns of purposive behavior can crystallize.

REFERENCES AND NOTES

1. John Stuart Mill, "Nature", in *Readings in Philosophy*, J. H. Randall, Jr., J. Bechler, E. Urban Shirk, eds., New York, 1950.
2. Cf. L. L. Whyte, "Organic Structural Hierarchies", *Unity Through Diversity*, Gray and Rizzo, editors, New York, 1972.
3. Whitehead called this "The Fallacy of Misplaced Concreteness". Cf. *Process and Reality*, New York, 1929.
4. A. Koestler, *The Ghost in the Machine*, New York, 1967.
5. Kirtley F. Mather, "The Emergence of Values in Geologic Life Development", *Zygon*, No. 1 (1969).
6. Paul B. Sears, "Utopia and the Living Landscape", *Daedelus*, No. 2 (1965).
7. Polanyi advances the categorical statement, "It is impossible to represent the organizing principles of a higher level by the laws governing its isolated particulars." Cf. Michael Polanyi, *The Tacit Dimension*, New York, 1966.

In a later article ("Life's Irreducible Structure", *Science*) he specified that "each level is subject to dual control: (i) control in accordance with the laws that apply to its elements in themselves, and (ii) control in accordance with the laws of the powers that control the comprehensive entity formed by these elements".

8. B. Commoner, "Is Biology a Molecular Science?" *The Anatomy of Knowledge*, M. Grene, ed. Amherst, 1969.
9. Gerard expresses this by saying, "I see a progressive change toward more and more integrated systems. ... The evolution of systems is toward increased integration, at whatever level; then new levels are superposed." "Hierarchy, Entitation and Levels", *Hierarchical Structures*, Whyte, Wilson and Wilson, eds., New York, 1969.
10. See J. Needleman, *The New Religions* (New York, 1970); Harman's reference to it, and Harman's own assessment of the emerging "new metaphysic" ("Alternative Futures and Habitability", below).

6

Gestalt Ecology: How Do we Create our Space?

NOEL MCINNIS*

I SHOULD LIKE to announce here what may be one of the most significant occurrences since the discovery that the missing link between the ape and civilized man is us. I refer to the emergence of an as-yet-unidentified amorphous field of study which I have termed "gestalt ecology". "Gestalt ecology" will devote itself to the understanding and modification, when appropriate, of the psycho-cultural bases of environmental perception. If this field of study becomes recognized for its true significance, and is developed accordingly, the likelihood of our successful evolution to fully civilized humanity may be considerably increased.

A brief description of the phenomena with which gestalt ecology will concern itself is to be found in Carl Sandburg's account of the Kansas sodbuster:[1]

> Who was that early sodbuster in Kansas? He leaned at the gatepost and studied the horizon and figured what corn might do next year and tried to calculate why God ever made the grasshopper and why two days of hot winds smother the life out of a stand of wheat and why there was such a spread between what he got for grain and the price quoted in Chicago and New York. Drove up a newcomer in a covered wagon: "What kind of folks live around here?" "Well, stranger, what kind of folks was there in the country you come from?" "Well, they was mostly a lowdown, lying, thieving, gossiping, backbiting lot of people." "Well, I guess, stranger, that's about the kind of folks you'll find around here." And the dusty gray stranger

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had just about blended into the dusty gray cottonwoods in a clump on the horizon when another newcomer drove up: "What kind of folks live around here?" "Well, stranger, what kind of folks was there in the country you come from?" "Well, they was mostly a decent, hardworking, lawabiding, friendly lot of people." "Well, I guess, stranger, that's about the kind of folks you'll find around here." And the second wagon moved off and blended with the dusty gray cottonwoods on the horizon while the early sodbuster leaned at his gatepost and tried to figure why two days of hot winds smother the life out of a nice stand of wheat.

What Carl Sandburg is telling us here is that the world cooperates with us by conforming to our expectations of it. The classic example of this is, of course, the paranoid, who suspects that everybody is against him, and who therefore relates to people in such a way that they are bound to be against him.

The tendency for reality to be a self-fulfilling prophecy rather than an absolute given has been explained by some modern anthropologists. Dorothy Lee writes in the introduction to *Freedom and Culture*:[2]

The common theme of the essays in this volume is that culture is a symbolic system which transforms the physical reality, what is *there*, into experienced reality. It follows from this assumption that the universe as I know it or imagine it in the Western world is different from the universe of the Tikopia, in Polynesia. It follows, also, that I feel differently about what I see. As I look out of my window now, I see trees, some of which I like to be there, and some of which I intend to cut down to keep them from encroaching further upon the small clearing I made for my house. The Dakota Black Elk Indian, however, saw trees as having rights to the land, equal to his own. He saw them as the "standing peoples, in whom the winged ones built their lodges and reared their families".

In cultural behavior, I see a system whereby the self is related to the universe—the relevant universe in each case, whether society, nature, the known universe, or ultimate reality. The individual acts within each culturally structured situation would then be expressions of this relatedness. The breaking of the soil in the agricultural process may be an act if violence, of personal aggression, of mastery, of exploitation, of self-fulfilment; or it may be an act of tender fostering, of involvement in the processes of the earth, of helping the land to bring forth in its due time; it may be an act of worship, and the field an altar.

According to the conceptual framework of my culture, I perceive my own behavior differently from the way in which people of another cultural framework view theirs. And which of these is the true way? When I throw a ball, do I perform an aggressive causal act, as my culture predisposes me to believe? Or does the ball leave my hand, as the Greenland Eskimo puts it, or do I merely actualize the ball's potential to move, as the Navaho would have it? These are different ways of perceiving the same situation, but which is the truth? Are they all true, all different facets of the same truth?

I turn to the study of other cultures largely to answer this question. I be-

lieve that these are all different codifications of the same reality, and different responses in terms of these codifications. My own culture, with its laws of logic, its principles of cognition, its rigidly defined limits of validation, offers me a strongly bounded and precategorized view of reality. This is one way of perceiving; it is a finite way—yet reality, itself, I believe to be infinite.

When I study other cultures, I find a different codification, I get a different glimpse of reality, from a different starting point. I find other, equally self-consistent systems of symbolization, with diametrically opposed principles of validation of experience. Thus I am enabled to some extent to go beyond my own finite view; I am enabled to see my culture as one of many possible systems of relating the self to the universe, and to question tenets and axioms of which I have never been aware.

The role of culture as a "codification of reality" is similar to the role of language in the theory of linguist Benjamin Lee Whorf:[3]

Language [Whorf said] is more than just a medium for expressing thought. It is, in fact, *a major element in the formation of thought.* Furthermore, to use a figure from our own day, man's very perception of the world about him is programmed by the language he speaks, just as a computer is programmed. Like the computer, man's mind will register and structure external reality only in accordance with the program. Since two languages often program the same class of events quite differently, no belief or philosophical system should be considered apart from language.

Language, in other words, acts as a filter which allows certain things to pass through to our awareness while screening other things out. We are familiar with the perceptual condition known as colorblindness. Certain physiological factors programmed by the genes and chromosomes make it impossible for some persons to perceive the color green. Similarly, language, programmed by our culture, makes us psychologically equally unable to perceive certain things. Our language, and not the external realities to which that language refers, tends to be the ultimate definer of our reality.

Probably the most fully advanced studies of the psycho-cultural bases of environmental perception are those of Edward T.Hall, who has expanded Whorf's thesis to include all culture. Hall advances the thesis that:[4]

the principles laid down by Whorf and his fellow linguists in relation to language apply to the rest of human behavior as well—in fact, to all culture. It has long been believed that experience is what all men share, that it is always possible somehow to bypass language and culture and refer back to experience in order to reach another human being. This implicit (and often explicit) belief concerning man's relation to experience was based on the assumptions that, when two human beings are subject to the same "experience", virtually the same data are being fed to the two central nervous systems and that the two brains record similarly.

Hall's research in "proxemics", by which is meant man's personal and social uses of space as a means of structuring his relationships to and with his fellow man, indicate that such assumptions are inaccurate at best and invalid at worst. Not only do persons of different cultures speak different languages, thereby providing alternate "programs" for the interpretation of external reality, but[5]

> what is possibly important, [they] *inhabit different sensory worlds.* Selective screening of sensory data admits some things while filtering out others, so that *experience as it is perceived* through one set of culturally patterned sensory screens is quite different from experience perceived through another. The architectural and urban environments that people create are expressions of this filtering-screening process. In fact, from these man-altered environments, it is possible to learn how different peoples use their senses. Experience, therefore, cannot be counted on as a stable point of reference, because it occurs in a setting that has been molded by man.

The following is one of numerous examples with which Hall demonstrates that the same external data, the same spatial arrangements, can be experienced differently by different peoples:[6]

> Pushing and shoving in public places is characteristic of Middle Eastern culture. Yet it is not entirely what Americans think it is (being pushy and rude) but stems from a different set of assumptions concerning not only the relations between people but how one experiences the body as well. Paradoxically, Arabs consider northern Europeans and Americans pushy, too. This was very puzzling to me when I started investigating these two views. How could Americans who stand aside and avoid touching be considered pushy? I used to ask Arabs to explain this paradox. None of my subjects was able to tell me specifically what particulars of American behavior were responsible, yet they all agreed that the impression was widespread among Arabs. After repeated unsuccessful attempts to gain insight into the cognitive world of the Arab on this particular point, I filed it away as a question that only time would answer. When the answer came, it was because of a seemingly inconsequential annoyance.
>
> While waiting for a friend in a Washington, D.C., hotel lobby and wanting to be both visible and alone, I had seated myself in a solitary chair outside the normal stream of traffic. In such a setting most Americans follow a rule, which is all the more binding because we seldom think about it, that can be stated as follows: as soon as a person stops or is seated in a public place, there balloons around him a small sphere of privacy which is considered inviolate. The size of the sphere varies with the degree of crowding, the age, sex, and the importance of the person, as well as the general surroundings. Anyone who enters this zone and stays there is intruding. In fact, a stranger who intrudes, even for a specific purpose, acknowledges the fact that he has intruded by beginning his request with "Pardon me, but can you tell me...?"
>
> To continue, as I waited in the deserted lobby, a stranger walked up to where I was sitting and stood close enough so that not only could I easily

touch him but I could even hear him breathing. In addition, the dark mass of his body filled the peripheral field of vision on my left side. If the lobby had been crowded with people, I would have understood his behavior, but in an empty lobby his presence made me exceedingly uncomfortable. Feeling annoyed by this intrusion, I moved my body in such a way as to communicate annoyance. Strangely enough, instead of moving away, my actions seemed only to encourage him, because he moved even closer. In spite of the temptation to escape the annoyance, I put aside thoughts of abandoning my post, thinking, "To hell with it. Why should I move? I was here first and I'm not going to let this fellow drive me out even if he is a boor." Fortunately, a group of people soon arrived whom my tormentor immediately joined. Their mannerisms explained his behavior, for I knew from both speech and gestures that they were Arabs. I had not been able to make this crucial identification by looking at my subject when he was alone because he wasn't talking and he was wearing American clothes.

In describing the scene later to an Arab colleague, two contrasting patterns emerged. My concept and my feelings about my own circle of privacy in a "public" place immediately struck my Arab friend as strange and puzzling. He said, "After all, it's a public place, isn't it?" Pursuing this line of niquiry, I found that in Arab thought I had no rights whatsoever by virtue of occupying a given spot; neither my place nor my body was inviolate! For the Arab, there is no such thing as an intrusion in public. Public means public. With this insight, a great range of Arab behavior that had been puzzling, annoying, and sometimes even frightening began to make sense. I learned, for example, that if A is standing on a street corner and B wants his spot, B is within his rights if he does what he can to make A uncomfortable enough to move. In Beirut only the hardy sit in the last row of a movie theater, because there are usually standees who want seats and who push and shove and make such a nuisance that most people give up and leave. Seen in this light, the Arab who "intruded" on my space in the hotel lobby had apparently selected it for the very reason I had: it was a good place to watch two doors and the elevator. My show of annoyance, instead of driving him away, had only encouraged him. He thought he was about to get me to move.

Another silent source of friction between Americans and Arabs is in an area that Americans treat very informally—the manners and rights of the road. In general, in the United States we tend to defer to the vehicle that is bigger, more powerful, faster, and heavily laden. While a pedestrian walking along a road may feel annoyed he will not think it unusual to step aside for a fast-moving automobile. He knows that because he is moving he does not have the right to the space around him that he has when he is standing still (as I was in the hotel lobby). It appears that the reverse is true with the Arabs who apparently *take on rights to space as they move.* For someone else to move into a space an Arab is also moving into is a violation of his rights. It is infuriating to an Arab to have someone else cut in front of him on the highway. It is the American's cavalier treatment of moving space that makes the Arab call him aggressive and pushy.

Carl Sandburg, Dorothy Lee, Benjamin Lee Whorf, Edward T.Hall, and numerous others have told us, in essence, that we create our own

space. What does this mean? As with Albert Einstein, it means that space is relative. Unlike Newtonian physicists, Einstein did not conceive of space as an absolute entity, in relation to which things are organized. Quite the contrary, he defined space as the relationship that exists among things as the result of their organization. When Fred Allen was asked to define relativity he replied, "If you take a great big lump of nothing and wrap metal around it, you get a stove pipe. And that's relativity." The absurdity of this quip lies in the assumption—which Newtonian physics took seriously—that something existed prior to wrapping the metal around it. Einstein demonstrated the impossibility of conceiving space without first conceiving of at least two reference points between which one is establishing a measured relationship. One can conceive of the distance between the earth and the moon only because there are, to begin with, the earth and the moon. One can conceive of the space in any room only because there are, to begin with, a measurably finite number of sides enclosing it. Thus space, said Einstein, is relative to the objects within and around it.

The scholars cited above have provided us with a very useful translation of physical relativity into behavioral relativity. To Einstein's demonstration that space can be defined only by reference to objects within and around it, they have added the further demonstration that space can be defined only with the additional reference to the *subjects* within and around it.

Psychologists have been aware of this process for several decades. The Rorschach test is a prime example of the ability—in fact, the inevitability—to create our own interpretations of spatial relationships. It is impossible to describe a Rorschach inkblot without reference to the individual describing it. Optical illusions, which have also intrigued psychologists for decades, are only less ambiguous examples of the arbitrary nature of space, descriptions thereof again depending on the perceptual state of the describer. Even supposedly unambiguous objects in our environment share this characteristic of the formal optical illusion, due to variations in the psychic and emotional state of observers. Numerous psychological experiments have demonstrated that our perceptions are greatly affected by our emotions. You can illicit grossly dissimilar physical descriptions of the same person, if you ask first one who fears him, and then one who loves him. Psychologists have demonstrated, therefore, that our idea of reality is determined by our perception of things, the way our senses interpret things, rather than the way things "really are". And it is the gestalt psychologists, with their study of figure-ground relationships and perceptual contextualism,

who perhaps have the most to say to those of us who are concerned with contextual problems.

What has all of this to do with ecological concerns? Approximately everything, because at bottom our present ecological crisis is a perceptual crisis. Man is destroying the delicate web of life because he does not perceive that his environment is, in fact, a web—a complex network of totally interactive beings, forces, and events, wherein stress on one of the strands affects the entire web. He no more perceives the implications of the fact that every square mile of the earth's surface contains material from every other square mile of the earth's surface, than he has perceived the implications of John Donne's observation that no *man* is an island either. This double failure is not a coincidence, but is in fact further evidence of the man-environment relationship demonstrated above. Man probably does not, will not, and cannot perceive interrelationships within his environment to any greater extent than he perceives his interrelationships with his fellow men. The ability to perceive interrelationships is probably a function of the ability to enact interrelationships—such is the definition of the ecological problem in its most inclusive sense.

A final quote from Edward T. Hall:[7]

> The relationship between man and the cultural dimension is one in which both *man and his environment participate in molding each other.* Man is now in the position of actually creating the total world in which he lives. ... In creating this world he is actually determining *what kind of an organism* he will be.

The ecological problem is not merely that mankind may bomb radiate, populate, or pollute himself out of existence. What man may *do* to himself is a contingent problem—contingent upon the way he *perceives*. The fundamental crisis of our age is a perceptual crisis. Perceiving external reality one way may lead us to actions which will eventually turn the world into one vast H-bomb, population-bomb, or smoke-bomb. Perceiving it another way, however, may lead us to actions which will establish a sense of balance and proportion in our relationship to the environment. What we need, obviously, is a perception of the world which will insure that we preserve it along with its human contents.

The chief obstacle to such a perception is a codification of reality which programs the mind to perceive otherwise. Dorothy Lee observed that "My own culture, with its laws of logic, its principles of cognition, its rigidly defined limits of validation, offers me a strongly bounded and precategorized view of reality". This is essentially a recognition that most of us are under the spell of what is historically known as the

Newtonian or Cartesian world view, depending on whether you wish to credit it to science or philosophy. I say we are under its spell because this is the version of reality that our culture has programmed us to perceive and, being largely unconscious of the program, we are unable to question its assumptions.

The Newtonian world view rests firmly on a dualistic assumption which the above scholars contradict, namely that external reality can be experienced objectively, without bias, as it really is. The Newtonian world view is a spectator-spectacle world view, in which the external spectacle is completely separable from the internal spectator, and thus precisely measurable without contamination from human error or disposition. Newtonian (or Cartesian) reality is measured by the process of reductionism, in which wholes are separated into their respective parts. Reality is then structured, for purposes of communication, into linear, sequential, cause-and-effect arrangements of the data gained from this piece-by-piece examination of the external world. Properly standardized by such a structural process, reality is thus thought to be communicable to all people with rational minds, whose interpretations of reality will then be in complete agreement.

The Newtonian world view has served us well, being essential to the development of the mechanized, industrialized, technologized society. It enabled us to fabricate such an extremely complex society by allowing us to refine productive processes into narrower and narrower areas of specialization, resulting in greater and greater degrees of technical efficiency. It enabled us to build a global technology literally by bits and pieces, and it served us adequately *until* that technology became global. But then something happened. Our global technology—this new world we created—seemed to develop a mind of its own. The cumulative and corporate effects of individual technological inputs became something we never intended, and our environment became polluted with fumes, radiation, noise, and increasing human squalor. What happened, of course, is that our global technology violated the norm of our highest earthly suprasystem, the biosphere.[8] It is with reverence for the fact that the norm of the highest suprasystem ultimately prevails that we should consider the currently popular warning, "Nature bats last", especially since the game of reductionism appears to be in the bottom of the ninth inning.

I submit that man will be unable to comprehend this problem as long as he is spellbound by a spectator-spectacle world view. The underlying assumption of reductionism is that the whole is the same as the sum of its parts. This stands today as a pernicious assumption, not

because our technology has become so complex that nobody can keep track of all the parts (a dilemma hopefully to be resolved by the computer), but because we now know of a fundamental man-environment relationship which the reductionist assumption makes it impossible to perceive. The reductionist assumption allowed us to build a global technology by bits and pieces, but prevents us from comprehending that technology as a whole.

As Hall has said,[9]

> both *man and his environment participate in molding each other.* Man is now in the position of actually creating the total world in which he lives. ... In creating this world he is actually determining *what kind of an organism* he will be.

The reductionist assumption completely obscures perception of the symbiotic interaction between man and environment Hall describes. Reductionism is a version of reality which programs us to perceive the elements of reality in isolated parts, whereas symbiotic interaction requires us to comprehend something which cannot be explained by reference to parts in isolation. Symbiotic interaction is a *process* which inevitably assumes that the whole is different from the sum of its parts. Such interaction can be comprehended only by perceiving the parts of a process in relation to one another as well as separate from one another. Or, more simply, such interaction can be comprehended only by perceiving process itself, as well as the products of process.

The spectator-spectacle world view is incomplete, since it cannot account for a fundamental characteristic of process, a characteristic which is the opposite of reductionism. This characteristic is called synergy. Synergy is the force which integrates discrete phenomena into organic, dynamic, whole relationships, bringing about behavior totally incapable of the respective components in isolation. One of the best examples of this force is the situation in which the molecular interaction of metals in an alloy produces a tensile strength 40 percent greater than the sum of their tensile strengths in isolation.[10]

Basic to an understanding of synergy in most contexts is the phenomenon we call "feedback", an inter-regulatory process by which the sender of a signal is able to perceive the effects of the signal on his environment and alter his behavior accordingly. The environmental imbalance caused by modern man is analogous to the environmental imbalance which results from an imperfect thermostat. Under proper operating conditions the thermostat sends a signal activating the furnace when the temperature falls below a certain level, and when the thermostat's environment reaches the desired temperature the thermostat modifies its "behavior" to reduce the supply of heat via another

signal to the furnace. If something prevents the thermostat from "perceiving" the change in the environment, however, the initial signal will prevail and the environment becomes overheated. Like an imperfectly functioning thermostat, man fails to perceive the fundamental change in his environment introduced by the cumulative and corporate effects of his technology. The feedback actually exists—hence the ecological crisis. The problem lies in man's incapacity to perceive these conditions as feedback from his own initiatives. This incapacity will continue as long as men perceive the world as an external spectacle subject to gross manipulation.

The solution to man's present problems lies in supplementing his present reductionist world view with one that permits him to perceive parts in relation to their wholes as well as in isolation, including his part in a society which daily generates global repercussions. Such a world view would assess reality in terms of synergism as well as reductionism, and convey an understanding of the process by which the world's communities can hang together rather than be hung-up separately. This would be a participant-observer world view, in which all actions—even the act of observation—would be perceived as participation in and thus modification of the reality of the world being viewed. The participant-observer world view would program our perceptual facilities for sensitivity to the phenomenon of feedback, and thus receptivity to gestalt or ecological perspectives.

Without such a world view, we shall never adequately interpret the effect of our actions on our environment. This point can be dramatically illustrated with reference to just one of the many problems of our technological era. Take air pollution. The individual whose version of reality is codified by the spectator-spectacle, Newtonian world view sees air pollution as an external, local problem. By an external problem, I mean simply that it deposits a film or a layer of soot on his white house. The fact that it also probably contributes to his earlier death is not perceived, the cause and effect relationship being only probable. His total life span with, as opposed to without pollution cannot be compared. There is no visible connection between air pollution and deaths from respiratory and cancerous disorders, except in occasionally severe smogs, or in the case of individuals in constant contact with large doses of pollutants. But there is a visible connection between smog and the dirt on one's white house. The ultimate externalizing of the smog problem is explained by reference to a more deeply seated phenomenon than that of visibility vs. invisibility, however, for as we have seen, the man whose sense of reality is codified by the spectator-spectacle world

view simply cannot comprehend the possibility of such a direct relationship between the world out there and his own person.

It is this same incapacity to perceive interrelationships which tends to make the spectator-spectacle world viewer perceive ecological problems as local ones. "Get the pollution out of *my* neighborhood, where it dirties *my* white house" is his most likely reaction to the problem—if, in fact, there is a reaction at all. If this means that the source of pollution must be relocated in another neighborhood, that is perceived as somebody else's problem rather than as evidence that pollution is everybody's problem and therefore society's problem.

How different the problem of air pollution appears when perceived within the reality structure of a participant-observer world view. The problem becomes internal as well as external. Aware that by changing his environment man also changes himself, the participant-observer world viewer is highly perceptive of the personal implications of such things as air pollution. The problem also becomes universal as well as local, since change in one element of the environment is known to require a reaccommodation among other elements of the environment. Perceptive of the air pollution problem in its broadest implications, the participant-observer world viewer is able to comprehend such possible global eventualities as the so-called "greenhouse effect", with its potential for a new ice age. The "greenhouse effect" hypothesis essentially argues that it is possible to cool the entire planet by heating the atmosphere with carbon pollutants. To the adherent of a spectator-spectacle world view, such a cause-effect hypothesis is preposterous. The synergetic process whereby the heating of a part of the system leads to a cooling down of the whole is considered nonsense, although almost every reductionist in our society owns a refrigerator which operates on the same principle. Further, to the spectator-spectacle world viewer, the temporarily remote nature of the "greenhouse effect" removes it entirely from the area of serious consideration. You cannot demonstrate the likelihood of a process which takes thousands of years to a man who insists on empirical evidence, and all reductionists come from Missouri. Finally, unable to perceive that he needs to be concerned about the larger society around him, the spectator-spectacle world viewer is unlikely to concern himself with the fate of future generations, as long as his own (local) family is not immediately threatened.

In other words, the reductionist finds it very hard to deal with statistical probabilities, because a statistic is always somebody else. This is true even at a low level order of phenomenon, such as an accident

to somebody driving a car or cancer occuring in somebody who smokes cigarettes. We are all very adept at perceiving such probabilities as probably happening to somebody else.

How do we enable man in the mass to acquire the ambi-perceptuality which will allow him to synthesize his perceptions as well as reduce them? Fortunately there are ways this can be done, both in the total society and in the society's most formative institution, the educational system. Let us first look at the society as a whole.

Perhaps the major force which sustains a spectator attitude toward the environment is the format of our communications system. Be it in classroom instruction, pulpit oratory, public assemblies, radio and TV programming, newspaper and book publishing—what have you—we are conditioned to perceive the world as an external spectacle in relation to which we are mere passive viewers and absorbers of information. Almost nowhere do our formal communications provide for our active participation in the transmission or (even more important) the creation of information. "The medium is the message"—our communications model provides an external reality structure which reinforces our presently incomplete internalized reality structure. And what is our internalized reality structure, our world view, but a communications model which shapes the manner in which we relate ourselves to (i.e. communicate with) our world?

The restructuring of our formal communications systems to provide for meaningful feedback would provide an external reality model capable of significantly modifying our internal one. It would enable man to perceive interrelationships precisely because it would involve him in interrelationships. The net effect could be to communicate that ours is a society and a world in which the individual citizen is actively involved in producing an effect on the whole. The net result might be the development of what Julius Stulman has called "the ability to live in change".[11]

Recent departures from the old one-way spectator-spectacle communications model in the direction of a two-way system can be documented in almost every type of communication we have. Classroom procedures are tending away from the lecture system towards dialogue and other group process formats. Pulpit pronouncements are being subjected to discussion during "feedback" sessions following the worship service. "Talk" radio programs are opening up their telephone lines to listeners. Television stations, such as CBS in Chicago, have experimented with an audience-participation device, appropriately called "feedback", whereby viewers can record their opinions on certain

news stories and current issues and see their responses compared with those of the wider viewing audience. Newspapers are featuring action lines and talk-back columns, which enlist voluntary services of readers or incorporate their opinions. These examples, even in total combination, are presently inadequate to have an appreciable effect on the total society. But they are indicative of a hopeful trend.

Another sign of hope for the development of a society capable of perceiving and enacting interrelationships is to be found in the new organizational style emerging in business institutions and certain academic communities, the latter especially in California. I refer to the *ad hoc* task force model of problem-solving, wherein decision-making is passing from the top levels of the bureaucratic hierarchy to temporary teams of experts who are called together, or who assemble spontaneously, for the solution of specific problems. My knowledge of this phenomenon derives largely from discussions with participants in the sixth annual Delos Symposion in Athens in July 1968.[12] This gathering of scholars and professional people from all over the world at the invitation of urban planner Constantinos Doxiadis, was convened to study human settlement policies, but the Symposion members found themselves inevitably drawn to the underlying issue in this article, the issue of process.

The increased concern with process is perhaps most detectable in education, which is exhibiting a trend away from monologue formats focusing on discipline toward dialogue formats focusing on issues and problems. The enculturation model of education, in which young and incompetent inferiors passively store data transferred to them by older and wiser superiors, is giving way to an acculturation model of education in which there is considerable exchange of ideas and information between student and teacher, allowing the teacher to better understand what the student needs to know and allowing the students to better understand what the teacher has to tell them. Along with the trend toward dialogue there can be detected a trend away from an exclusive preoccupation with the reduction of knowledge via separate disciplines and toward the organization of multiple disciplines around given problems. Problems, after all, come in wholes, and while they may submit to a sociological analysis, a biological analysis, or an economic analysis, they are incapable of being resolved by a sociological solution, a biological solution, or an economic solution. To the extent that our educational system adopts dialogue methodologies to gestalt configurations of content, another potential force for increasing man's ability to enact and perceive interrelationships will be at hand.

I am not suggesting, however, that the problem of developing gestalt perceptual abilities and a potentially concomitant ecological sensitivity will solve itself, and that ecologists can congratulate themselves for not having to enlarge the scope of their concerns. As I suggested initially, I would like to urge the development of *gestalt* ecology, which technically refers to the application of perception reasearch to ecological concerns, and which generally refers to the promulgation of ecological wisdom in terms of a socio-psycho-biological world view. Effective ecological education is not likely to take place until this happens.[13]

The purpose of education being to modify behavior according to the implications of the subject matter at hand, the ultimate goal of the ecologist as educator is to *encourage ecological behavior*. The thesis of this paper is, of course, that such an educational objective can be achieved only if we know the relationship between environmental perception and behavior. Fortunately, there is at least one technical volume devoted to the scientific exploration of the relationship between environmental perception and behavior.[14] It is appropriately entitled *Environmental Perception and Behavior*,[15] and consists of reports by geographers of their attempts to measure this relationship by various visual tests.

Perhaps the most significant to ecologists of the papers in this book is that by Robert Beck, "Spatial Meaning, and the Properties of the Environment". This paper reports on a test which analyzes an individual's spatial predisposition in terms of five dichotomous variables: diffuse vs. dense space, delineated vs. open space, verticality vs. horizontality, rightness and leftness in the horizontal plane, and upness and downness in the vertical plane. The paper reports on those spatial preferences which tend to characterize geographers, and suggests that personality implications can be derived from this data after sufficient research.

Another paper, by Joseph Sonnenfeld, "Environmental Perception and Adaptation Level in the Arctic", documents the hypothesis that "understanding of the sources of variance in environmental perception is essential to an understanding of variation in man's environmental behaviors". The documentation consists of references to several testing instruments, including a photographic one which he discusses at length.

In a third article, "The Perception of Storm Hazard on the Shores of Megalopolis", Robert W.Kates reports on an interview technique used to determine the perceptivity to danger of coastal inhabitants in the hurricane zone. The article will not necessarily encourage those who wish man were more perceptive of environmental conditions (one respondent to the interview reported, "We might have a couple of

hurricanes, but not a storm"). But together with the previous articles it does suggest an approach to understanding human behavior with reference to environmental perception.

I believe we can consider it axiomatic that human behavior is partially, and a large part at that, a function of environmental perception, and that we cannot begin to understand it and educate it without a thorough study of the relationship between the given and the perceived environments. More specifically, we will not be able to comprehend the present insensitivity of most people to ecological problems, nor effectively counter that insensitivity, without some measured understanding of this problem. The studies I have cited as pioneer contributions to gestalt ecology are merely a beginning at definition of the problem. Much more basic research will be necessary before we can devise reasonably workable solutions.

Assuming that we are, in fact, the missing link between ape and civilized man, assuming that various ecological time bombs make it increasingly imperative that we complete the transition to man, and assuming that we have the ability to modify the perceptual insensitivities which impede that transition, I cannot overemphasize the need for developing *gestalt* ecology.

REFERENCES AND NOTES

1. Carl Sandburg, *The People, Yes*, Harcourt, Brace & Company, 1936, New York, p. 120.
2. Dorothy Lee, *Freedom and Culture*, Prentice-Hall, 1959, New York, pp. 1–2.
3. Edward T. Hall, *The Hidden Dimension*, Doubleday & Company, Inc., 1966, New York, pp. 1–2.
4. Ibid, p. 2.
5. Ibid.
6. Ibid., pp. 144–146.
7. Ibid., p. 4.
8. See Erwin Laszlo, "Reverence for Natural Systems", above. In Laszlo's terms, reductionism has proven self-falsifying, because the resulting interaction has disconfirmed its assumptions.
9. Ibid.
10. R. Buckminster Fuller, *World Design Science Decade Document II: The Design Iniative*, World Resources Inventory, 1964, Carbondale, Ill.
11. See Julius Stulman, "Beyond Crises...", below.
12. See also Robert A. Smith, III, "Synergistic Organizations...", below.
13. It is encouraging to note that such a socio-psycho-biological world view is emerging. See Willis, W. Harmon on the new science of consciousness, in "Alternate Futures and Habitability", below.

14. Numerous volumes in the bibliography concluding this essay also explore this relationship.
15. David Lowenthal, ed., *Environmental Perception and Behavior*, University of Chicago, Dept. of Geography Research Paper no. 109, 1967.

BIBLIOGRAPHY

Barker, R. G., *Ecological Psychology: Concepts and Methods for Studying the Environment of Human Behavior*. Stanford: Stanford University Press, 1968.

Bayes, Kenneth, *The Therapeutic Effect of Environment on Emotionally Disturbed and Mentally Subnormal Children*. (Available from the Society for Emotionally Disturbed Children, 1010 St. Catherine W, Montreal, Quebec, Canada).

Benedict, R., "Synergy: Patterns of the Good Culture", *Psychology Today*, 1970, **4**, (1).

Bonifazi, Conrad, *A Theology of Things*. New York: J. B. Lippincott, 1967.

Čapek, Milič: *The Philosophical Impact of Contemporary Physics*. New York: Van Nostrand Reinhold, 1961.

Carr, Stephen, "The City of the Mind", in William R. Ewald, Jr., (Ed.), *Environment for Man: The Next Fifty Years*. Bloomington: Indiana University Press, 1967.

Charter, S. P. R., *Man on Earth: A Preliminary Evaluation of the Ecology of Man*. Sausolito, California: Contact Editions, 1962.

Doxiadis, Constantinos A., *Ekistics*. New York: Oxford University Press, 1968.

Dubos, Rene Jules, "Man Adapting: His Limitations and Potentialities", in Williams R. Ewald, Jr., (Ed.), *Environment for Man: The Next Fifty Years*. Blominton: Indiana University Press, 1967.

Hebb, D. O., *Organization of Behavior*. New York: John Wiley & Sons, 1949.

Katz, Marvin (Ed.), *Sciences of Man and Social Ethics: Variations on the Theme of Human Dignity*. Boston: Branden Press, 1969.

Koyré, Alexandre, *From the Closed World to the Infinite Universe*. New York: Harper—Torchbooks, 1957.

Laszlo, Ervin, *System, Structure, and Experience: Toward a Scientific Theory of Mind*. New York: Gordon and Breach, 1969.

Margenau, Henry, *The Nature of Physical Reality*. New York: McGraw-Hill, 1950.

Matson, Floyd, W., *The Broken Image*. New York: Doubleday—Anchor, 1964.

May, Rollo, *Psychology and the Human Dilemma*. New York: Van Nostrand, 1967.

McLuhan, Marshall, *The Gutenberg Galaxy*. New York: New American Library—Signet, 1970.

Pepper, Stephen, *World Hypotheses*. Berkeley: University of California Press, 1961.

Proshansky, M., and Nelson, W., *Environmental Psychology*. New York: Holt, Reinhart, and Wilston, 1970.

Siu, R. G. H., *The Tao of Science*. Cambridge: M.I.T. Press, 1957.

Sommer, Robert, *Personal Space: The Behavioral Basis of Design.* Englewood Cliffs: Prentice Hall—Spectrum, 1969.

Studer, R. G., "The Dynamics of Behavior-Contingent Physical Systems", *Ekistics*, **27**, 160, 1969.

Theobald, R., *An Alternative Future for America II.* Chicago: Swallow Press, 1970.

Watts, Alan, "The Individual as Man/World", in Paul Shepard and Daniel McKinley (Eds.), *The Subversive Science: Essays Toward an Ecology of Man.* Boston: Houghton Mifflin, 1969.

Watts, Alan, *Nature, Man and Woman.* New York: New American Library—Mentor, 1958.

Whyte, Lancelot Law, *The Next Development in Man.* New York: New American Library—Mentor, 1962.

7

Alternate Futures and Habitability

WILLIS W. HARMAN*

To be concerned about habitability, about the physical and psychosocial factors which contribute to or detract from the quality of life, is literally to be concerned with the whole world. It is to be concerned with the future of the biosphere as well as the design of a work environment; with new technological threats to individual freedoms and rights as well as with inner-city housing.

And how does one go about thinking about the whole world? Clearly we need new conceptual tools. This paper is a memorandum report on research in progress at the Educational Policy Research Center, Stanford Research Institute. The work itself aims at illuminating educational policy, or housing policy, or enforcement and justice, or health, or for that matter, defense policy—if we properly understand what the defense of America means—in any event you are forced to the same questions. What is our range of available futures? What are the requirements for a habitable future? What policy choices would help move us toward the goal of universal access to a high quality of life?

In what follows we present one framework for thinking about these problems, and about the broad policy choices which make up the context of more specific system and design choices. Some of the major findings thus far are also summarized.

The trail of the discussion is somewhat hard to follow, so a preliminary map will help. We begin with a description of a method of constructing alternative "future histories" and with a summary set of

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such histories for the next 30 years. From these some broad conclusions are drawn, highlighting what we came to term the "world macroproblem". This leads to a reconsideration of some very basic premises in the culture which appear to be at the root of the world macroproblem—premises which are so much a part of our way of perception that they largely go unexamined. We briefly examine two additional indications of a drastic shift in premises and values taking place. All this, then, becomes the context for a systematic assessment of policy issues relating to habitability—an assessment yet to be made.

PRECIS OF THE METHOD OF CONSTRUCTING ALTERNATIVE FUTURE HISTORIES

The method we have used to construct alternative future histories derives from an approach originated by Robert Johnson of Johnson Research Associates, Santa Barbara, California. In underlying philosophy it is similar to the powerful relaxation methods of mathematical physics. Its ultimate power lies in the possibility of continued refinement, through systematic iterations, of a field of feasible future histories, considered as a whole.

In this preliminary work we first chose six aspects of U.S. society to comprise a minimal descriptive framework. (More aspects would provide a richer description but be harder to handle.) These were: U.S. Economics, U.S. Internal Politics, Science and Technology, U.S. Demographic Patterns, World Population/Subsistence, and U.S. Foreign Relations.

For each of these we selected from 4 to 6 alternative patterns covering the likely range of variation. Thus a description of the state of society comprised, in its skeletal form, a choice of one pattern in each of six aspects. Sparse though such a description may seem, this listing leads to well over 20,000 possible combinations.

The next task was to reduce these by eliminating those which are not self-consistent or do not seem feasible by the year 2000. Reduction to approximately 50 internally consistent descriptions proved relatively rapid. Next these were examined to see which could plausibly occur in sequence, working forward from the present state and working backward from various assumed end (year 2000) states. Continued reexamination of the set of plausible sequences as a whole, to eliminate remaining inconsistencies and to uncover missed possibilities, resultedin the "tree" of alternative future histories shown in Figure 1.

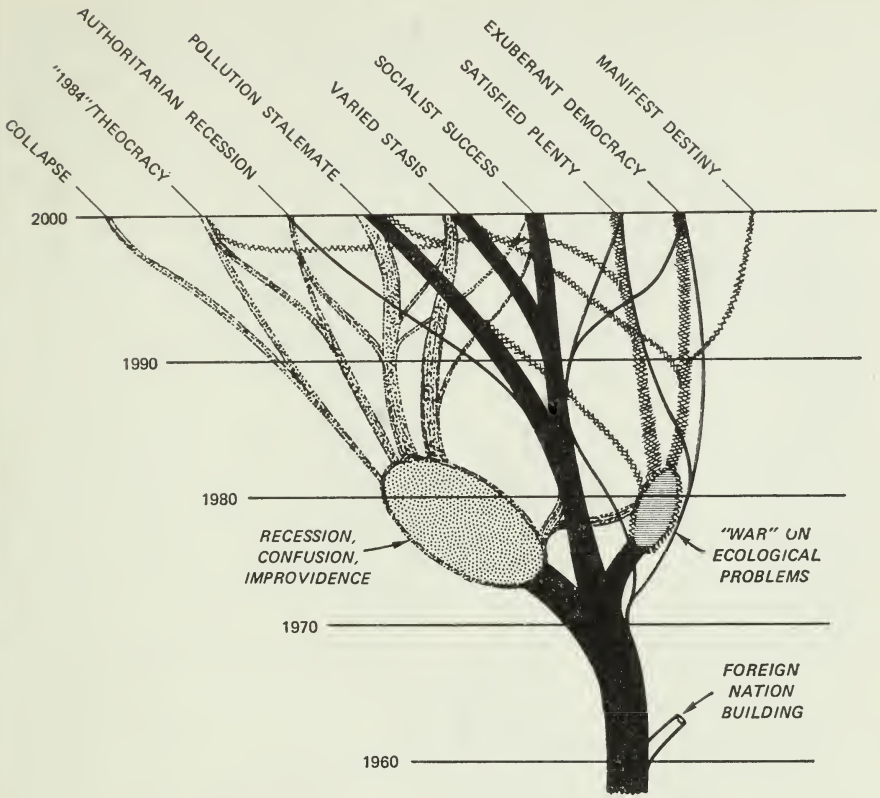

FIGURE 7:1 "Tree" of alternative future histories

Examination of the prose descriptions of the various "year 2000" alternative states showed that they tended to differ in two especially significant dimensions. One has to do with the degree to which the society is adept (both competent and motivated) at achieving its undertaken goals. The other relates to the degree of "openness", implying flexibility, accessibility, and decentralized decisionmaking. A suggestive representation of the "year 2000" slice of the tree of Figure 1, with the alternative future states arrayed in these two dimensions, is given in Figure 2.

These results, to repeat, must be considered tentative and preliminary. The alternative future states need to be fleshed out in various ways to provide richer descriptions. Prevailing value-belief systems in the different paths need to be examined, and stake-holder-group dynamics at the branching points assessed. The whole needs to be recycled and adjusted until overall consistency is assured. Nevertheless, to the extent

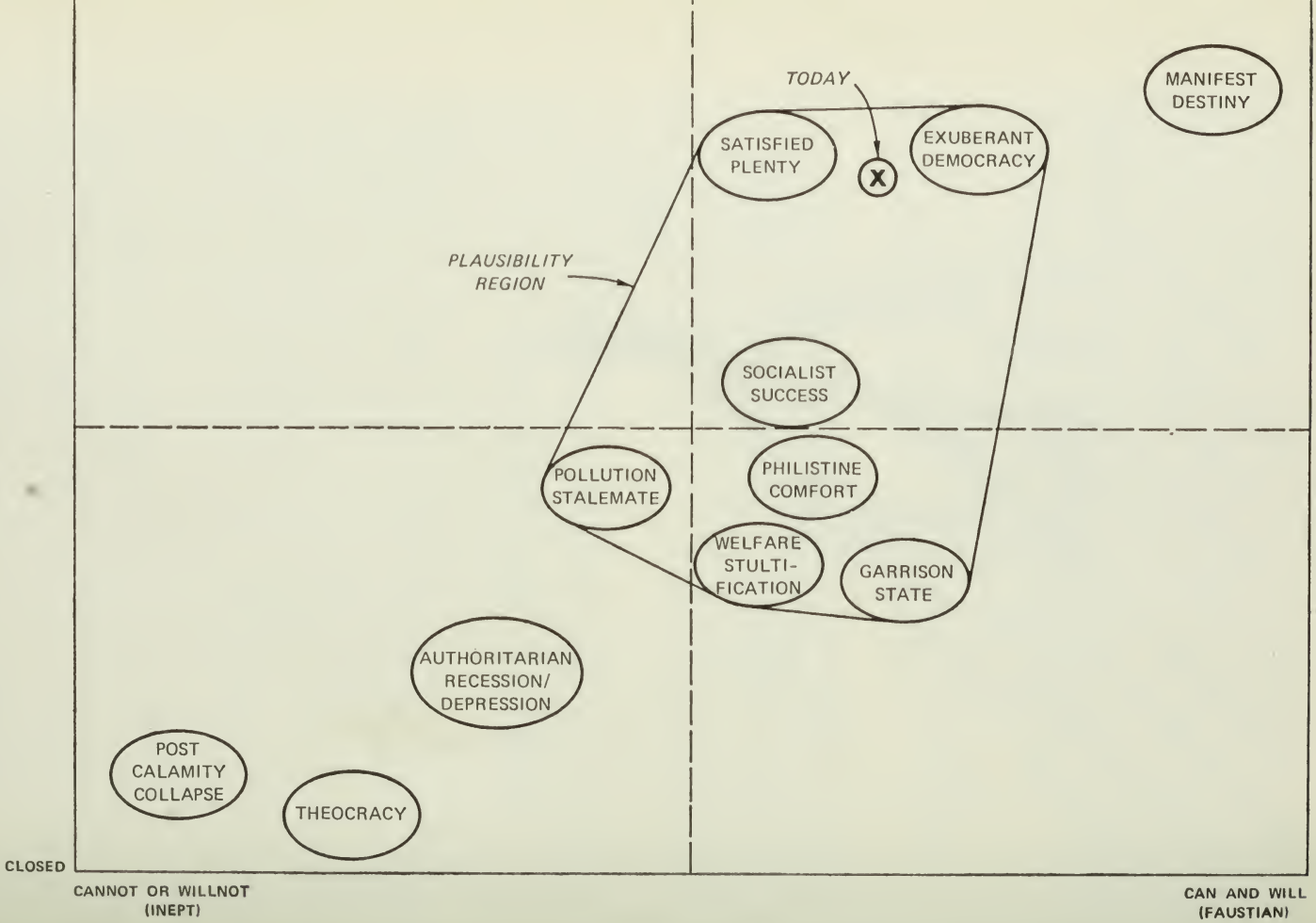

FIGURE 7:2 "Slice" of Figure 1 at year 2000

that the major features of the present futures map seem dependable, important policy implications follow.

A PRELIMINARY GENERAL CONCLUSION

The abbreviated names assigned to the different paths in the map are too concise to convey much detail, and may even be misleading. More complete descriptions of the paths are being made available for serious examination of these findings. One should be hesitant about concluding anything on the basis of the brief remarks above and these two diagrams.

For example, the path labeled "Exuberant Democracy" is characterized by a mood of exuberant expansiveness, a high degree of confidence in the economy and the political system, a U.S. ability to project its influence throughout the world, an actively questing science, and an expanding technology. Identifications with the culture and the nation are positive and proud, and horizons are seen as unlimited. Americans and their government are extroverted and confident in their dealing with other nationals and nations. However, it seems very unlikely that this state of affairs could come about without an all-out national effort on ecosystem problems (including amelioration of poverty within and outside the nation), of a magnitude approaching that of World War II and with similar unification of national will, launched no later than 1975–80. It is also probable that the solution of these problems would have involved considerable encroachment on individual freedoms, and there would be impingement on the quality of life in significant respects. Furthermore, if this state has been reached through a successful "Green Revolution" in agriculture, thus avoiding widespread famine in the underdeveloped world, population levels are likely to be such as to have resulted in a very fragile ecosystem balance; the prognosis for the decades beyond 2000 involves probable catastrophe within another half century.

From Figure 1 it appears that unless some such overriding goal as a "war on ecological problems" serves to unite the increasingly fractioned nation, a path representing an undesirable future history is all too likely. To be successful in pulling us over into the more desirable stem such an effort would have to have a sufficiently large scope to touch the lives of most Americans (beyond its reflection in their taxes). It would need to focus public action for a sustained rather than a spasmodic effort, to mobilize resources enough to make obvious progress,

and to engender sufficient mutual trust and commitment to enable joint action on a mass scale.

In overall outlook, it appears that of some two score of feasible future histories there are very few which manage to avoid one kind of time or another of serious troubles between now and 2050. The few that do, require a dramatic shift of values and perceptions with regard to what we came to term the "world macroproblem".

THE WORLD MACROPROBLEM

This macroproblem will be the predominant concern of the foreseeable future, for all the alternative paths. It is the composite of all the problems which have been brought about by a combination of rampant technology application and industrial development together with high population levels (in turn a consequence of technology-reduced mortality rate):

- Problems of the ecosystem (ecological imbalances, fouling of the environment, resource depletion; overpopulation and consequent famine and plague in underdeveloped regions)
- Intrinsically expanding have-havenot gap (domestically and between nations, with resulting internal and external dissension)
- Technological threats (weapons of mass destruction; vulnerability of a complex society to sabotage; new powers to "engineer" the human body, mind, foetus, and genetic transmission; threats to privacy and individual rights; mental stress of complex living).

Although terms like "environment" and "ecology" have entered the political rhetoric, we have not yet begun to take this world macroproblem seriously. Even among the informed public there is a pronounced tendency to believe:

- that new technological breakthroughs will be achieved which will enable us to control population
- that the "Green Revolution" in agriculture will solve the world food problem
- that technological breakthroughs in contraception will take care of the population explosion
- that the deterrence policy will continue to preserve the world from the horrors of nuclear warfare
- that international controls will adequately protect against small-nation development and use of biological weapons

- that the right programs for urban problems will begin to reduce the severity of the problems of racism in the nation
- that the drastically fallen world image of America, from the hope of the oppressed to imperialist oppressor, is a regrettable consequence of our involvement in the Vietnamese conflict, and can be righted by our finding a satisfactory way to extricate ourselves from the situation
- that, as soon as the Vietnam war is over, we will begin to make steady progress on the serious social and environmental problems which beset us
- that, by supplying capital and American knowhow to the underdeveloped nations, we will begin to close the have-havenot gap which poses a continuing threat to world peace, *or* that the issue can be safely disregarded
- that, as available supplies of physical resources—fresh water, fossil fuels, minerals, etc.—are used up, technological breakthroughs will provide substitutes
- that, as per capita energy usage continues to rise and conventional power sources (hydroelectric, fossil fuels) approach limits, technological breakthroughs will result in new energy sources (efficient solar cells, nuclear fusion processes with no side radioactive contaminants) which will fill the demands.

As our work progressed these expectations looked less and less credible. Rather, the various aspects of the world macroproblem looked more and more like surface manifestations of a pathogenic condition much more fundamental. This showed up in the projections of alternative futures, wherein it appeared that desirable "future histories" were hard to come by, and involved significant changes in operative values. It appeared again as we attempted to analyze how the world had gotten to its present state and began to suspect that it was implicit in the premises of present forms of the technological-industrial state, awaiting only suitable levels of population and technological application to become intolerable. It showed up once again as we grappled with the significance of contemporary revolutionary forces and found that the crucial gap is not that between generations, nor between liberals and conservatives, but between those who anticipate a continuation of present trends and those who insist that a drastic change is absolutely necessary.

PATHOGENIC PREMISES

Admittedly the concept of pathogenic premises is a loose one. It is meant to connote that certain aspects of the prevailing (whether explicit or implicit) premises are problem-generating; in other ways they may produce useful consequences. For example, at one time the premise that black persons are subhuman contributed significantly to a thriving agricultural economy in the South. Few today, however, would doubt that it was also pathogenic. Similarly, premises which contributed significantly to our present industrial and technological accomplishments may have pathogenic aspects with present population levels and technological powers. Among these might be listed:

- The premise that the pride of families, the power of nations, and the survival of the human species are all to be furthered (as in the past) by population increase.
- The "technological imperative", that any technology that *can* be developed, and any knowledge that *can* be applied, *should* be.
- The premise that the summed knowledge of experts constitutes wisdom.
- The reductionist view of man, a premise associated with the development of contemporary science and which lends sanction to dehumanizing ways of thinking about and treating men.
- The premise that men are essentially separate, so that little intrinsic responsibility is felt for the effects of present actions on remote individuals or future generations.
- The premise that man is separate from nature, and hence that nature is to be exploited and "controlled" rather than cooperated with.
- The "economic man" image, leading to an economics based on ever-increasing GNP, consumption, and expenditure of irreplaceable resources.
- The premise that the future of the planet can safely be left to autonomous nation-states, operating essentially independently.
- The disbelief that "what ought to be" is a meaningful concept and is achieveable.

The reason that these premises are pathogenic now, whereas they were apparently fairly workable in the recent past, lies in the way in which the future is profoundly different from the past. From now on, *verything* in man's environment, in his physical makeup and behavior, and in his future development, is subject to human meddling, inter-

ference, and "control". But we have not developed the responsibility for making the momentous choices which face us.

If we are correct in this judgment that the various aspects of the world macroproblem, while they may be ameliorated or postponed by certain technological achievements, are intrinsic in the basic operative premises of present industrialized culture—if this is correct, then it follows that *self education toward changing those premises is a paramount and urgent task for the nation and for the world.* This involves at least the assumption of responsible stewardship of life on earth, and the associated changes in values and premises. It probably includes adaptation to a new and evolving metaphysic which will support these changes (since values are always rooted in an implicit picture of man-in-relationship-to-his-world), and probably calls for a new alliance between education and law enforcement to help us through a coming time of troubles.

A CONFLICT IN PREMISES

A conflict exists between the basic premises of a democracy—that man is, by virtue of his transcendental nature, endowed with reason, will, and a valid sense of value—and the reductionistic, deterministic, physicalistic premises of the prevailing behavioral-science and socio-political theories. Sociology has shifted from its earlier emphasis on the semiphilosophical "humanities" approach to an emphasis on techniques and empirical studies, with the implication that man is a creature of his drives, habits, and social roles, in whose behavior reason and choice play no decisive part. In psychology courses this point of view is likely to be made even more explicit, with consciousness considered to be an inconsequential accompaniment to behavior governed by external stimuli and instinctive urges. Contemporary political science tends to focus on the processes by which public policies are made, and to be relatively little concerned with their contents. Amid the measurement of attitudes, population movements, organizational trends, and political behavior, and the modeling of society and governments, little attention is given to the historic questions relating to man, his condition, and his destiny.

On the other hand, the concept of a transcendental, choosing, ultimately responsible self is essential to the entire theory of democratic government. It underlies the assumption that the criminal is responsible for his act (while recognizing in providing rehabilitation opportunities that his antisocial traits may have their roots in environmental

conditioning). It is basic to the assumption in the judicial process that the judge can meaningfully make a normative judgment. It is essential to the workability of "government of the people, by the people, and for the people".

This conflict in basic premises is directly related to the future of the planet. Arguing from essentially the same standpoint as the "world macroproblem" discussion above, Victor Ferkiss[6] asserts that nothing short of a new guiding philosophy is required to meet the challenge of the years just ahead. He outlines three basic elements which such a new philosophy would have to incorporate. First is what he terms a "new naturalism", which affirms that man is absolutely a part of a nature, a universe, that is always in process of becoming. The second element, "the new holism", recognizes that "no part can be defined or understood save in relation to the whole". The third, "the new immanentism", sees that the whole is "determined not from outside but from within". It follows from these that meaningful social policies must be ecological in character, that is, they must be based on a recognition that any decision, any change affects everything in the total system. Men's actions and the forces they set in motion are all part of the developing whole; "every part of the whole has power and influence; every living particle is a source of direction and life". If man is to acquire the necessary sense of responsibility for the impact of his own actions on the shaping of the whole, he "must so internalize these ideas and make them so much a part of his instinctive world view that they inform his personal, political and cultural life".

As we shall see below, two other forces in society appear to be urging us toward similar premises and values, toward a new image of man. One is an aspect of the dissent of youth; the other a development within the realm of science.

The kinds of educational system and educational goals a society sets up, the way it handles the problems of environment and social injustice, the priorities it gives to aesthetic considerations, the extent to which it considers its citizen's need for easy access to communion with nature, the uses of leisure it fosters—all these aspects and many more are affected by the image of man held by society. Currently in our society these potent emerging forces push for a change in that image, in the direction of transcendent man. Thus far the power is on the side of reductionists.

THE GREAT REFUSAL

One of these two forces, a component of the youth revolution, is what Mendel[7] terms "the Great Refusal" to go along with the old values, a protest "against that pitiful caricature of man created by five centuries of urban, technological, and scientific progress—*homo economicus*. The essential accusation of the Great Refusal is directed against the subordination of human experience to the economic processes of the consumer society and its increasingly more absurd products, to the aggressive militarism that at least in our case has become so tightly interwoven with this society, and to the gigantic, impersonal organizations through which it all functions".

Nor is it only among the youth that we find such sentiments. Increasingly, business executives are heard to include, sincerely to some extent at least, high in the list of corporate objectives of providing opportunity for the fulfillment of members of the organization, and of contributing in some fashion to the welfare of mankind.

It is, of course, an oversimplification to the point of risking distortion to lump all the dissent together as the "Great Refusal". The situation is a good deal more complicated than that. Let us comment on one aspect of the dissidence of youth which is particularly relevant to our discussion here. At least four distinct movements can be discerned which, by around 1968, had coalesced to form one rather powerful thrust. As a consequence of these four tributaries, the present movement has a unique character stemming from its use of what might be termed "person-changing technology".

The first of these converging streams is the new political activism starting with the civil-rights movement which enlisted idealistic youth in increasing numbers for the dozen or so years following the Supreme Court decision (Brown *vs* Board of Education) in 1954. Later causes included the Vietnam war, the draft, "nonrelevance" of higher education, university involvement in weapons research, etc. A second stream, the psychedelic or hippie movement, could be said to have begun in 1963 with the founding by Harvard's Timothy Leary of the International Foundation for Internal Freedom (IFIF), promulgating the ethic "Turn On, Tune In, Drop Out". A third tributary didn't start with the young so much as with the psychotherapists—the "human potential movement", which takes 1961 as its birthdate, with the founding of the first of the "growth centers", Esalen Institute, at Big Sur, California, and also the founding of the American Association for Humanistic Psychology. The fourth component is much older, the left-

wing political group which was finding its new heroes in Fidel Castro and Mao Tse Tung. As these four movements began to join forces (for some purposes, although this is not meant to imply the existence of a unified political movement), and especially as it became more common to assert that "the real revolution is not in the ghetto or on the campus, but in people's heads", the use of the "person-changing technology" became more deliberate.

Some of the elements of this change technology are listed in Table 1. Emphasis is on increased awareness in two directions, (a) of the higher-consciousness nature of man, and hence of the demeaning quality of the prevailing images of hehavioral-science man and economic-man,

TABLE 1

Elements of "person-changing technology"	Typical outcomes
Meditation Yoga Psychedelic drugs Hypnosis, autohypnosis Psychosynthesis	Awareness of spiritual dimensions of transcendental self, of the "hypnotic" or "encapsulated" nature of ordinary life
Sensory awareness	Sensitivity to feelings and emotions, beauty
Self-awareness exercises Psychotherapies Group therapy Sensitivity training Encounter groups	Sensitivity to human closeness, self honesty, realization there is nothing to hide
Gestalt therapy Group nudity, marathons Psychodrama	Spontaneous response to experience, self-expression, individual autonomy, emotional freedom
Synanon games New Theater (ridicule of Establishment, crudity and nudity, audience encounter)	Removal of guilt and fear stemming from early training regarding morality and sin
Forceful disruption of normal social process Underground press	Ego-reducing experience, awareness of ego-defense nature of social institutions and customs
Radicalizing confrontations Deliberate provocation of "instructive encounters" such as police confrontations, black-white confrontations, etc.	Perception of oppressive nature of social institutions

and (b) of institutionalized hypocrisy, inequity, and inhumanity in the social system. The techniques near the top of the list tend to aim more at expanded self-awareness, and those near the bottom at heightened social awareness.

Young peoples' concern with "awareness-expanding" and "consciousness exploring" activities is intimately related to their reformulated value convictions. If materialism was the philosophical base for the Old Left, it appears that some form of existential transcendentalism may be coming to play that role for the New Left. The far-flung network of "rock stations", broadcasting revolutionary messages in the lyrics of their songs and in their parodies of news programs, intersperse material on religious, metaphysical, psychic, and esoteric topics. As Roszak notes in one of the most penetrating analyses of the youth revolt,[8] "If one scans any of the underground weeklies, one is apt to find their pages swarming with Christ and the prophets, Zen, Sufism, Hinduism, primitive shamanism, theosophy, the left-handed Tantra... At the level of our youth, we begin to resemble nothing so much as the cultic hothouse of the Hellenistic period, where every manner of mystery and fakery, ritual and rite, intermingled with marvelous indiscrimination." Notwithstanding, he notes, there is a unifying theme. "The world view of Lao-Tzu, of the Buddha, of the Zen masters ... has become one of the strongest strains of the counterculture... The counterculture is, essentially, an exploration of the politics of consciousness."

A NEW SCIENCE OF CONSCIOUSNESS?

Such indications of a shift in the metaphysical premises of the public at large, or the younger part of it, might appear to be a mere fad. More significant in a way are indications that scientists—persons with recognized scientific training who are on the staffs of research organizations and universities with high standards and who hold membership in recognized scientific associations—are manifesting more and more interest in developing a science of ordinary and extraordinary subjective experience. The study of "altered states of consciousness" is not completely new, of course. The phenomena of hypnosis have been studied in a scientific way, off and on, for at least a century and a half. Phenomenology has been a sporadic influence in psychology. Freud's psychoanalysis and its offshoots have attempted to probe the unconscious processes. But the present thrust is toward a more basic shift in implicit premises and root metaphor

A list of pioneering works in the systematic exploration of consciousness would include William James' *Varieties of Religious Experience*, F. W. H. Myers' *Human Personality and Its Survival of Bodily Death*, Richard Bucke's *Cosmic Consciousness*, Pitirim Sorokin's *The Ways and Power of Love*, and the writings of numerous Vedanta, Sufi, and Zen scholars. Among modern psychotherapists whose works fit into this same category are C. G. Jung, Roberto Assagioli, and Hubert Benoit. Several new scientific journals serve the field, in particular the *Journal of Transpersonal Psychology* and the *Journal for the Study of Consciousness*.

Research activity is currently significant in at least three approaches to altered states of consciousness: Feedback of EEG signals, psychedelic chemicals, and classical (by which we mean sensory deprivation, yoga, autohypnosis, hypnosis, meditation, etc.). Its should be noted that there are two recent and significant advances in this area. One is increased access to and voluntary control of diverse states of consciousness making them more available for exploration. The other is the appearance of physiological correlates to altered states (EEG, EMG, GSR, REM, etc.). This latter is of extreme importance in a philosophy-of-science sense. The scientist of subjective experience is now much more in the position of the physicist studying an electron, or the astronomer studying a galaxy, in that he can say, "Here is a phenomenon (dream, satori state, etc.) which defies strict definition, but which I can study through various correlates (alpha waves, rapid-eye-movement, verbal report, observable behavior, etc.). In effect, it means that the barrier between objective, "public" data and subjective, "private" data is gone for good and the legitimated boundaries for scientific scrutiny are thus extended.

The science of consciousness is in its infancy. Even so, some of its foreshadowings are evident. With the re-classification of man's subjective experience into the realm of empirical inquiry, we can anticipate an acceleration of research in this area. Consequently, there is new hope of consensus on issues—especially value issues—which have been at the root of conflict for centuries (just as earlier there came about consensus on the place of the Earth in the universe, and on the origin of man). The new science bids fair to incoprorate the most penetrating insights of psychology, the humanities, and religion. These developments will have profound impacts on goal priorities in society, on our concepts of education, on the further development and use of technology, and perhaps (as in the case of the Copernican revolution) on the distribution of power among social institutions and interest groups.

The real significance of a science of subjective experience and

"altered states of consciousness" is that it is in this area that our individual and social values are experientially and historically rooted. The development of such a science would redress what in retrospect is a puzzling discrepancy between the audacity with which man has pursued the physical, biological, and social sciences, and the timidity with which he has contemplated the possibility of developing a moral science. Already in the field of clinical psychology several scientists are proposing to formulate through their researches "a natural value system, a court of ultimate appeal for the determination of good and bad, of right and wrong" (A.H. Maslow), with "universal human value directions emerging from the experiencing of the human organism" (Carl Rogers). What may be in the offing is new means of obtaining consensus on value questions, by submitting them to the test of what is ultimately wholesome for the whole man.

THE NATURE OF THE EMERGENCE PREMISES

Thus, we have argued, there appear to be in the present situation (a) a *need* for drastic change in the pathogenic premises which have generated the world macroproblem, (b) an emerging *force* for change in the Great Refusal of youth, and (c) an emerging *supportive metaphysic* coming jointly from the nascent science of consciousness and from the collective inner explorations of millions of more informal investigators, particularly among the youth What is this new metaphysic or, if you will, new religion? It would seem premature to attempt to describe the end state of a conceptual revolution which, if it is taking place, is certainly only in its beginning stages. Yet the signs seem clear enough to warrant a prediction. But let us turn first to four propositions which are well supported by findings of modern science and which, if extrapolated, point in the direction we seek. These may be stated as follows.

1. The breadth and magnitude of human capacities and resources far exceed present levels of actualization within persons or societies.

2. A far greater portion of significant human experience than we ordinarily assume is comprised of unconscious processes.

3. World- and self-perceptions are strongly conditioned by familial and social learning, as well as by personal needs and motives.

4. These world- and self-perceptions, in turn, tend to be self-fulfilling.

We can take the space to summarize only briefly some of the supporting research in studies of creativity, hypnosis, psychotherapy, sen-

sory deprivation, psychopharmacology, small-group processes, learning, stress, expectancy-set, extrasensory perception, and altered states of consciousness.

1. *Human potentiality is far greater than is ordinarily realized.* The following list of specific substantiation indicates the richness of the supporting data:

- Demonstrated increased access to and utilization of (through intervention, technique, or change process) conscious processes, e.g., eidetic perception, memory, intelligence, will power, divergent thinking, reading ability, problem solving ability;
- Demonstrated increased access to and utilization of (again through intervention, technique, or change process) unconscious process, e.g., imaginal thought; hypnagogic image; expanded space, time, and self-dimensions; suppressed or repressed memory;
- Demonstrated increased emotional and perceptual sensitivity to self, others, materials, and natural phenomena;
- Demonstrated enhanced sensory-physical capacities, e.g., endurance, strength, concentration, sensation thresholds, etc. (including compensatory accomplishments of the handicapped);
- Demonstrated increases in specific characteristics, e.g., leadership ability, love, tolerance, flexibility, courage, motivation to achieve, etc.;
- Anecdotal data regarding enhanced performance in emergency situations;
- Extraordinary tracking and other abilities of primitive peoples;
- Extraordinary specialized abilities (paranormal ability to detect counterfeit bills, analyze aerial photographs, recognize voices, remember long sequences of numbers, etc.; arithmetic talents and other capacities of idiot savants; eidetic imaging; absolute pitch; etc.);
- Anecdotal accounts of paranormal abilities; e.g., extrasensory perception, psychokinesis.

2. *A far greater portion of significant experience than we ordinarily assume is unconscious. The supporting data includes:*

- Clinical data from the field of psychotherapy (in which a significant if not a major portion of the conceptual models used imply the importance of unconscious processes);
- Studies of dreaming, of the hypnagogic state, of the hypnotic retrieval of "forgotten material", of subliminal perception;
- Studies of the effects of sensory deprivation, hallucinogenic and psychedelic drugs;

- Studies of repression and recall;
- Anecdotal data from creative persons, "Synectics" groups; etc.

3. *World- and self-views are in general strongly conditioned.*

Here again the supporting research comes from a variety of areas:

- Anthropological studies indicating that perceptions of self, others, and the environments are highly influenced by the culture in which one is immersed;
- Clinical data from psychotherapy indicating the extent to which each individual has his own set of distorting lenses (e.g., the paranoid);
- Research on visual perception indicating the extent to which what is perceived depends on past orderings of perceptions (e.g., the Ames demonstrations), on felt needs, on expectations, and on the influence of important others (e.g., the Asch experiments);
- Studies of authoritarianism and prejudice, indicating the extent to which other persons are seen in terms of stereotypes;
- Examples from the history of science illustrating how new conceptualizations have resulted in new ways of perceiving the world;
- Research on the role of self-expectations in limiting academic achievement of underperforming children;
- Hypnosis research demonstrating the effect of suggestion-induced expectations;
- Anecdotal data relating to behavior changes induced by self-image change following plastic surgery;
- Research on performance level as related to expectancy set;
- Athletic coaching practices utilizing deliberate enlargement of self-expectations;
- Effects of experimenter expectations in research on animal learning;
- Studies of student performance enhancement through teacher expectations (e.g., the Rosenthal-Jacobson study);
- Expectation-performance relationships in studies of conquered peoples, prison-camp populations, etc.;
- Anecdotal data from executive training seminars based on the principle of altering self-expectations through autosuggestion.

4. *World- and self-perceptions tend to be self-fulfilling.*

This too is supported by a great deal of data, experimental and anecdotal, including the following:

- The sociological theorem of W. I. Thomas, "If men define situations as real, they are real in their consequences";
- Research on expectancy set, experimenter beliefs, and placebo

studies of psychotropic drugs, hypnotic phenomena, hypnotic susceptibility, sensory deprivation;

- Anecdotal data and case studies in psychotherapy;
- Anecdotal data from executive training courses exploiting positive expectations;
- Work of the Nancy school of psychology (Émile Coué *et al.*).

Let us assume, as seems likely, that further research continues to subtstantiate these four propositions to greater and greater extent. Research on altered states of consciousness appears to be opening access to those processes which had heretofore been "unconscious". The extrapolation appears to point in the direction of some very old premises, as is evidenced by this brief selection of quotations from classical religious writings:

Man is made by his belief... As he believes, so he is.
Bhagavad-Gita

All things are possible to him that believeth.
Mark 9: 23

All that we are is the result of what we have thought:
It is founded on our thoughts, it is made up of our thoughts.
Dhammapada (Buddha)

Therefore I tell you, whatever you ask in prayer,
Believe that you receive it, and you will.
Mark 11: 24

For truly, I say to you, if you have faith as a grain
of mustard seed, you will say to this mountain,
"Move hence to another place", and it will move;
Matthew 17: 20

It is wisdom to know others;
It is enlightenment to know one's self.
Lao Tzu

Know this Atman
Unborn, undying,
Never ceasing,

Never beginning,
Deathless, birthless,
Unchanging forever.
Bhagavad-Gita

Jesus said: Let him who seeks not cease in his seeking until he finds;
and when he finds ... he will marvel, and will be a king over the All.
The Gnostic Gospel of Thomas

THE OLD "NEW AGE" PREMISES

Jacob Needleman,[9] in a recent study of contemporary religious interests speaks of "the spiritual explosion", a "searching for transcendental answers to the fundamental questions of human life" which has recently "intensified beyond measure". "Bookstores are crammed with Eastern sacred texts, studies of astrology, reincarnation, states of consciousness, and the like. Students across the country are demanding courses in Buddhism, Hinduism, and mysticism... Psychiatrists, psychologists, and clergymen of all faiths are joining the younger generation in this pursuit ... to see for themselves if the East has a knowledge to offer our threatened society and our tormented religions."

Aldous Huxley[10] was one of the first modern writers to suggest that an age-old set of basic assumptions about the nature of man was showing new strength. We shall borrow his term, "The Perennial Philisophy":

> "Philosophia Perennis—the phrase was coined by Leibniz; but the thing—the metaphysic that recognizes a divine Reality substantial to the world of things and lives and minds; the psychology that finds in the soul something similar to, or even identical with, divine Reality; the ethic that places man's final end in the knowledge of the imminent and transcendent Ground of all being—the thing is immemorial and universal. Rudiments of the Perennial Philosophy may be found among the traditionary lore of primitive peoples in every region of the world, and in its fully developed forms it has a place in every one of the higher religions. A version of this Highest Common Factor in all preceding and subsequent theologies was first committed to writing more than twenty-five centuries ago, and since that time the inexhaustible theme has been treated again and again, from the standpoint of every religious tradition and in all the principal languages of Asia and Europe."

The basic proposition of the "Perennial Philosophy" is an experimental one, that man can under certain conditions attain to a higher awareness, a "cosmic consciousness", in which state he has immediate knowledge of a reality underlying the phenomenal world, in speaking of which seems appropriate to use such words as infinite and eternal, Divine Ground, Brahman, Godhead, or Clear Light of the Void. From this vantage point, one's own growth and creativity, and his participation in the evolutionary process, are seen to be under the ultimate direction of a higher center (Atman, the Self of Vedantic writings, the Oversoul). Ordinary perceptions of one's life and of one's environment are likened to the perceptions of a hypnotic trance. Such phenomena as extrasensory perception, precognition of future events, levitation and other psychokinetic events, "instant" diagnosis and healing, etc., are only extraordinary, not *a priori* impossible.

The basic assumptions of positivistic science stand in relationship to the Perennial Philosophy much as Newtonian mechanics relates to relativistic physics: They are in no way invalidated for those aspects of human experience to which they are appropriate, but comprise a special case, a limited form of the more general theory. Similarly, the philosophies of materialism and idealism are to each other as the wave and particle theories of light and matter; each fits the world as seen with a particular mode of observation, and a complementary relationship holds between them.

Of course the Perennial Philosophy is not new to Western culture. It is present in the Rosicrucian and Freemasonry traditions. Its symbolism in the Great Seal of the United States, on the back of the one-dollar bill, is testimony to the role it played in the formation of this country. It also appears in the Transcendentalism of Emerson, the Creative Evolution of Bergson, and the extensive writings of William James.

Whether one ascribes its recent popularity to increased intellectual openness and tolerance or to anxiety brought on by the nuclear threat, indications abound that increasing numbers of persons seem to be taking its premises seriously. Rising book sales in metaphysics, transcendental philosophy. Eastern religious philosophies, and parapsychology indicate growing interest in these related areas. Metaphysically oriented churches, societies, and study groups are much in evidence.

Part of society's thus far negative reaction to monistic and Eastern kinds of beliefs as they have appeared in the hippie culture, the drug scene, and numerous cults, has been due to the fear that they would lead to quietism and withdrawal and, therefore, would undermine the social structure. Although it is true that these beliefs have been associated with the Eastern world, there is in fact nothing in the Perennial Philosophy which is contrary to virile and active participation in economic and political affairs. Neither are these premises in any way contrary to a high-technology society; they only say something about the ends to which that technology would be put.

Should these forces prevail and some sort of transcendentalist premises come to dominate the culture, the consequence would be a social and historical phenomenon of magnitude comparable with the Protestant Revolution. It might well be accompanied by as pervasive and varied changes in the whole sociocultural system—organizational forms, roles, norms, traditions, power concentrations, and social processes, as accompanied the rise of the Protestant ethic.

ALTERNATIVE FUTURES AND POLICY CHOICES

Now let us return to the alternative future histories. In the shift in basic premises which was postulated in the preceding section takes place, it would be congenial with a future history tending somewhat to the right in Figure 1, and aiming toward the upper center of Figure 2. Whether or not it is accompanied by such a change in the underlying metaphysic, such a path is about as favorable a one as can be found.

To approach such a favorable future history with a good level of habitability, and to avoid the clearly undesirable futures, seems an eminently reasonable aim. Assuming this, from the preceding discussion, at least six major societal tasks emerge:

1. Make a concerted direct attack on the most urgent aspects of the world macroproblem.
2. Establish mechanisms for control of technological development and application, and for extent and rate of industrialization.
3. Alter prevailing values, perceptions, and premises from those which have pathogenic aspects to others which are more conducive to maintenance of a habitable environment.
4. Establish a new sense of national purpose to put forth the effort which will be required to prevent serious further degradation of the habitability of the environment.
5. Meet the habitability demands of diverse groups, particularly poor, working class, and minority groups.
6. Ensure continuing habitability of various specific environments.

Each of these tasks may require new conceptualizations—for example, long-range analysis of the world macroproblem requires the concept of a homeostatic ecology for the entire biosphere, and especially for the urbanized parts of it. They may require research and development, institutional changes, various kinds of programs and change processes. The matrix of Figure 3 suggests a systematic way of examining these tasks for specific policy implications. We are a long way from having adequate studies for the boxes in this matrix, let alone having started appropriate action. If the foregoing analysis is at all on the mark, the time is very late.

CONCLUDING REMARK

In this brief paper we have attempted to suggest that the most crucial issues bearing on habitability are not necessarily the most obvious ones.

Aspects of the habitability component of societal tasks

Societal task	a. New conceptualizations	b. Research and development	c. Institutional changes	d. Programs and resources	e. Change processes
1. Make direct attack on aspects of the world macroproblem					
2. Control technological application and industrial development					
3. Alter values, perceptions, and premises					
4. Establish a new sense of national purpose					
5. Meet the habitability demands of varied groups					
6. Ensure continuing habitability of various specific environments					

FIGURE 7:3 Matrix of social tasks and habitability components

If the wrong issues are addressed, the policy which emerges will inevitably be faulty. The most important issue in this nation may well not be one involving radicals versus conservatives, or youth versus middle age, or haves versus havenots, but rather one between those who assume that the future can be more or less like the present, versus those who are convinced that the pathogenic premises and values in the culture are going to have to be replaced by more constructive and humane ones.

The macroproblem which the world faces, and which is rapidly and ineluctably becoming more serious, is at root a problem of value and basic premises—in short, a moral problem. Thus the kind of leadership required in the world is moral leadership. The United States could reassert its role in this domain, but only if we first eliminate our own confusion. It would seem to follow that the paramount task for the nation is the fostering of a unifying national purpose, the developing

of a will to build toward a nation with liberty and justice—and a habitable environment—for all and to take the lead in "the stewardship of the future" to ensure continued habitability of spaceship Earth.

REFERENCES AND NOTES

1. Bases for these arguments are reported in forthcoming publications of the Educational Policy Research Center, Stanford Research Institute, Menlo Park, Calif.
2. MacLeish, A., "The Great American Frustration", *Saturday Review*, July 13, 1968, pp. 13–16.
3. Wheeler, H., "Bringing Science Under Law", *The Center Magazine*, **2**, March 1969, pp. 59–67.
4. Peccei, A., *The Chasm Ahead.* New York: MacMillan, 1969.
5. For an elaboration of this argument see Means, R. L., *The Ethical Imperative.* New York: Doubleday, 1969.
6. Ferkiss, V. C., *Technological Man: The Myth and the Reality.* New York: George Braziller, 1969.
7. Mendel, A. O., "Robots and Rebels". *The New Republic*, Jan. 11, 1969, p. 16.
8. Roszak, T., *The Making of a Counter Culture* (Reflections on the Technocratic Society and its Youthful Opposition). New York: Doubleday, 1969, pp. 83, 140, 156.
9. Needleman, Jacob, *The New Religions*, New York: Doubleday, 1970.
10. Huxley, Aldous, *The Perennial Philosophy.* New York: Harper and Brothers, 1945.

8

Synergistic Organizations: Humanistic Extensions of Man's Evolution?

ROBERT A. SMITH, III*

FIVE TRUTHS OF SYNERGISM BY FIVE TRUTHFUL MEN

Affluence means that everybody has more choice than before. Choice is an art which no doubt has to be learned.

Kenneth E. Boulding, "Time as a Commodity", *The New Republic*, February 21, 1970.

Large, complex social events and problems are not reducible to systematic terms, although they have systematic aspects. The space program, the troubles of our cities, the war in Vietnam, all reflect some systematic process that we find in other contexts. But they also have their idiosyncratic components and their fortuitous ones. To understand, predict or control the course of events, one must effect a synthesis based on systematic knowledge and on the idiosyncratic features of that situation with which he is confronted.

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The views expressed in this paper do not necessarily reflect those of NASA. It was first presented at the Symposium "Managing the Challenge of Change" in Athens, Georgia, April 1–2, 1970. Subsequent to presentation of this paper and its preparation, two articles bearing on the subject appeared in *Psychology Today* for June, 1970. These were: "About Ruth Benedict and Her Lost Manuscript" by T. George Harris and "Patterns of The Good Culture", by Ruth Benedict. Dr. Maslow previously had kindly furnished the author the material in this paper relating to Dr. Benedict's work, in January, 1970. Furthermore, Lester Ward's "Social Telesis" must be taken into account. Ward defines "synergy" as where the behavior of the whole cannot be predicted by the sum of its parts, or the behavior of any one of its parts.

Raymond A. Bauer, *Second-Order Consequences: A. Methodological Essay on The Impact of Technology* (Boston: The MIT Press, 1969).

Monarchies, aristocracies, and religions are all based upon that large defect in your race—the individual's distrust in his neighbor and his desire for safety's or comfort's sake, to stand well in his neighbor's eyes. These institutions will always remain, and always flourish, and always oppress you, affront you, and degrade you, because you will always be and remain slaves of minorities.

Mark Twain, *The Mysterious Stranger.*

The unit of dynamic analysis thus becomes the systematic matrix of interacting, goal-seeking, deciding individuals and sub-groups—whether this matrix is part a formal organization or only a loose collectivity. Seen in this light, society becomes a continuous morphogenic process, through which we come to understand in a unified conceptual manner, the development of structures, their maintenance, and their change. And it is important to recognize that out of this matrix is generated, not only social structure, but also personality structure, and meaning structure. All of course, are intimately interrelated in the morphogenic process, and are only analytically separable.

Walther Buckley. "Society as a Complex Adaptive System", in Buckley, Editor. *Modern Systems Research for the Behavioral Scientist* (Chicago: Aldine Publishing Co., 1968.)

... Man's dignity lies in the irreducible fact of human choice, choice which joins freedom and responsibility. The second is that the human agent in his decision and action is not alone. In his choosing he must come to terms with other men and with forces greater than his own, greater indeed than the power of man, collectively or generically.

Kenneth D. Benne. *Education for Tragedy* (Lexington: The University of Kentucky Press, 1967).

SYNERGISTIC ORGANIZATIONS

Synergy is a word bandied about rather frequently—a hipster word unfortunately for most. Some few identify it as that something coined by Maslow. Fewer still research for the source of this rather interesting word.

Actually, the concept of synergy was invented and developed by Ruth Benedict, the poet and anthropologist, at Bryn Mawr College.[1] I know that it is difficult for Madison Avenue businessmen to associate the concept of synergy with a female—yet, it was quite natural that a woman should develop the concept and that a compassionate man, like Maslow, should expand upon it. Synergy connotes union or unity; a partnership, or partnerships, the effect of something whole. In the sense

FIGURE 8:1 Action wheel for the seventies*

* Following Jere W. Clark of Southern Connecticut State College.

of the union, it is indeed the female who senses it, for, she is the bearer and developer of combined energy resulting from sexual union. I would suspect that Ruth Benedict, being also a poet, glimpsed unitary wholes and intuitively recognized that the whole is infinitely greater than the sum of its parts. Maslow wisely observes that most anthropologists, prior to Benedict, dealt with cultures as if they were unique and idiosyncratic. While each society does, of course, possess idiosyncratic features, there are overriding similarities to be found among different cultures.[2]

Prior to leaving Benedict, perhaps some explanation should be made of types of synergy. She settled on the concepts of "high synergy" and "low synergy". Her definition was:[3]

> Is there any sociological condition which correlates with low aggression? All our grand plans achieve the one or the other in proportion as their social forms provide areas of mutual advantage and eliminate acts and goals that are at the expense of others in the group... From all comparative material,

the conclusion that emerges is that societies *where non-aggression is conspicuous have social orders in which the individual by the same act and at the same time serves his own advantage and that of the group*... Non-aggression occurs (in these societies) not because people are unselfish and put social obligations above personal desires, but when social arrangements make these two identical. Considered just logically, production—whether raising yams or catching fish—is a general benefit and if no man-made institution distorts the fact that every harvest, every catch adds to the village food supply, a man can be a good gardener and also be a social benefactor. He is advantaged and his fellows are advantaged...

I shall speak of cultures with low synergy where the social structure provides for acts which are mutually opposed and counteractive, and cultures with high synergy where it provides for acts which are mutually reinforcing... *I spoke of societies with high social synergy where their institutions insure mutual advantage from their undertakings, and societies with low social synergy where the advantage of one individual becomes a victory over another, and the majority who are not victorious must shift as they can.*

Maslow expands on Benedict's definitions in these words.[4]

Those societies have high synergy in which the social institutions are set up so as to transcend the polarity between selfishness and unselfishness, between self-interest and altruism in which the person who is simply being selfish necessarily reaps rewards for himself. The society with high synergy is one in which virtue pays.

So you see, each of us is a product and a process of synergy if one uses my definition of synergy as a combination or combinations of energy. Let me jump now in one swift intellectual scan and describe another quite visible, quite tangible form of synergy—the synergism of the sun and the sea. John Masefield's "Down to the Sea in Ships" has changed to "Down to Sea in Ships, up to Space in Satellites—Science Combinations Tackle the Environmental Enigma".[5] Recently, a large multidisciplinary research team embarked on a three-month mission to solve mysteries of the sea and its effects on the earth's environment. They concentrated their search in a 90,000 square mile area of tropical ocean and focused on projects ranging from radiation pollution to fish migration—yet, in the final analysis they were forced to give first priority to the weather—a synergistic product of the interaction of the sun and the sea.[6] This lead, in turn, to intensive efforts to forecast the weather.[7]

Today we face a new epochal era—an era when new combinations of energy (similar to unpredictable weather) are producing unsettled, riot-torn, and "swept-along feelings" of the times.[8] These new combinations are producing what the biophysicist, John R. Platt, likens to the breaking of the sound barrier—once the shocks are over, the air

flow smoothes out again.[9] I mention this, because I feel that we should become conscious of what directed and mis-directed combinations of energy can do. Directed energy combinations can produce a high level synergy which beautifies the city, cleans the air, overcomes fragmentation. Misdirected, or selfish combinations of energy produce a synergy which destroys the cities, pollutes the environment, and produces a radical racial form of separatism. But, like Platt, I believe we are going through a "social sound barrier" and the shock waves will recede.[10]

William R. Ewald, Jr., a leading development consultant to both the American Institute of Planners and the American Institute of Architects, points out "There has to be a wide understanding of what the great economic resource, the U.S. economy truly is" and "professional men, especially the designers of the huge technological environment we are looking into, dependent in so many ways on political decisions, need a working understanding of their Nations' economy".[11] This understanding, I believe, will lead to new understandings and new directions for unused and misused combinations of energy. So you see, the concept of synergy must not merely concern itself with union and wholes but also the right combinations so as to involve people and their energy in meeting national goals and commitments. And, today, we face international goals and commitments because many modern problems, like science, do not coincide with national boundaries.

In the past, it was possible to rely on the insights of brilliant individuals. Although brilliant individuals continue to emerge, a new synergistic methodology is called for. Stulman describes it as:

> A new methodology for thinking that leads us from the singular viewpoint to a system of thinking, from system to an organization of systems to synthesis, and from synthesis ultimately into metamorphosis—in other words, a methodology of integrated thought and action in which there is continuing feedback and flow forward to deal with constant changes at all levels.[12]

Expanding on Stulman's view, Benedict's high synergy is a transcendence where there is a fusion of opposites into a single concept. I feel that this concept could aptly be called the forming concept—a movable synthesis of both individual and organizational life.[13] The late Douglas McGregor captures Benedict's low and high synergy in his theory X and theory Y. Blake and Mouton developed a method of organizational development through plotting the high and low synergy positions of individuals and organizations. Rensis Likert has expanded on these concepts.[14] More recently Maslow has developed his theory Z which corresponds to my forming concept. Maslow begins his concept with these significant words.[15]

I have recently found it more and more useful to differentiate between two kinds (or better, degrees) of self-actualizing people, those who were clearly healthy, but with little or no experiences of transcendence, and those in whom transcendent experiencing was important and even central. As examples of the former kind of health, I may cite Mrs. Eleanor Roosevelt, and probably, Truman and Eisenhower. As examples of the latter, I can use Aldous Huxley, and probably Schweitzer, Buber and Einstein.

The former are more essentially practical, realistic, mundane, capable and secu'ar people, living more in the here-and-now world, i.e., what I called the D-realm for short, the world of deficiency-needs and of deficiency-cognitions. In this Weltanschauung, people or things are taken essentially in a practical, concrete, here-now pragmatic way, as deficiency-need suppliers or frustrators, i.e., as useful or useless, helpful or dangerous, personally important or unimportant.

"Useful" in this context means both "useful for survival" and "useful for growth toward self-actualization and freedom from basic, deficiency-needs". More specifically, it means a way of life and a world-view generated not only by the hierarchy of basic needs (for sheer physical survival, for safety and security, for belongingness, friendship and love, for respect, esteem and dignity, for self-esteem and feelings of worth) but also by the need for the actualization of one's personal, idiosyncratic potentialities (i.e., Identity, Real Self, Individuality, uniqueness, self-actualization). That is, it refers to the fulfillment not only of one's specieshood, but also of one's own idiosyncratic potentialities. Such people live in the world, coming to fulfillment in it. They master it, lead it, use it for good purposes, as (healthy) politicians or practical people do. That is, these people tend to be "doers" rather than meditators or contemplators, effective and pragmatic rather than esthetic, reality-testing and cognitive rather than emotional and experiencing, perhaps mesomorphic rather than ectomorphic.

Maslow is observing that Theory Z individuals and organizations have achieved or transcended into a fully integrated state of being and where life is a moveable synthesis not encumbered by the fragmenting effects of dialectical dichotomies.[16] Paraphrasing Erich Fromm, Theory Z may be considered a concept for a healthy individual or healthy organization seeking and maintaining a healthy environment. In developing his Theory Z, Maslow also reconstructed his hierarchy.[17]

a) The hierarchy of needs (which can be taken as coming to crises in a chronological progression *à la* Erikson, *or* with age held constant.
b) A progression of basic need gratifications from infancy through childhood, youth, adulthood, to old age, but at any time.
c) Biological, Phyletic Evolution.
d) From illness (diminution, stunting) to Health and Full-Humanness.
e) From living under bad environmental conditions to living under good conditions.

f) From being constitutionally or generally a "poor specimen" (in the biologist's sense) to being a "good specimen" in the zoo-keeper's sense.

I do not think that we can speak of synergy or synergistic organizations without devoting some attention to social system structure and patterns of communications. Bertram Gross observes that:[18]

The structure of any social system (or subsystem) consists of (1) people and (2) non-human resources, (3) grouped together into subsystems that (4) inter-related among themselves and (5) with the external environment and are subject to (6) certain norms and (7) some central guidance system that may help provide the capacity for system performance.

As with the elements of performance, here also we find considerable complexity. Internal relations, for example, can never be fully understood (or lateral) relations are also extremely important; some of these are concretized in the form of buyer-seller markets. Bargaining and negotiation, of course, are not limited to the economic market-place—any more than are conflict-and-cooperation relations limited to the political arena. Networks of communication and mobility are fundamental aspects of the relations among subsystems.

Gross also observes that:[19]

A full appreciation of the openness and dynamism of social systems can hardly be obtained without contemplating the variety of social systems and of the inter-relations among them. One way to analyze this variety is by arraying various systems on a continuum from the less to the more inclusive. This takes us from (1) individuals to (2) families and informal groups to (3) formal organizations, such as business enterprises, government agencies, and associations of various kinds and (4) the territorial entities in which the first three are invariably located. Most of the above varieties of social systems may, in turn, be arrayed on another continuum from the smaller to the larger. Thus organizations range from single entities to large complex clusters or constellations such as a country's banking or transport system. Territorial entities range from village and town to city, metropolis, megalopolis, subnational region, nation, transnational region or block and the world itself.[20]

John McHale captures the essence of global synergy in these words: "Today, as human consciousness is expanded electronically to global inter-linkage, we may see, hear, experience more in a single life-span than ever before."[21] Ludwig von Bertalanffy maintains that the senses should be considered as perceptual systems. If this is so, and I believe that it is, perceptual systems create a world around self and "so man, according to his choice, may become a vegetating plant, a capacious animal, or an angel and the son of God".[22] Basically, both McHale and Bertalanffy have captured the message of McLuhan that the coming electronics age will promote a world view by inolving each of us deeply in other's lives.[23] R. Buckminster Fuller, pragmatically and healthily,

is developing McLuhan's philosphical observations into reality at his Spaceship Earth Design Science Exploration located at Carbondale, Illinois, and on the Southern Illinois University campus. Fuller is (1) compiling a world resources inventory, developing (2) a world game incorporating transcultural high synergy partnerships and (3) a humanistic computer center. Fuller observes that "I travel around the world a great deal, and everywhere I hear humanity saying, 'we are not against any other human beings; we feel the world ought to work properly'. Everywhere they say it is our politicians who get us into trouble. This is the majority viewpoint around the earth today."[24] Fuller's world game has access to information from NASA's meteorological planet analysis and earth resources satellites.[25, 26]

> Not only does the World Resources Inventory show where all the people on earth are located and how they are moving about, but the total weather pattern as well. The total weather pattern will be correlated with the total crop pattern. We will know where the rains are, where the cattle and crops are, and how the weather may eventually be guided to insure the crops. The inventory includes world food production per year in metric tons, locally, nationally and globally. It shows the entire coal and iron resources of the earth and their rates of consumption. (A typical finding of the World Game is that there's more tin above ground in the United States than there is underground in the rest of the world.) You can learn the total tonnage of fibers produced per year, globally or locally, broken down into kinds of fibers. The inventory shows how many persons in Africa and Asia own radios, television sets and appliances. Trends show total energy consumption, electrical and thermal, around the whole globe.[27]

Fuller admits that mankind may already have violated its occupancy of spaceship earth beyond the point of tolerance. Of all the trends and patterns which his work has revealed, none stands out so clearly as that of man's inherent blindness, ignorance and indiscretion. Never in history has mankind consciously behaved in its own interest, but rather has stumbled blindly and accidentally into success, leaving a trail of waste and pollution. But time has run out. This wheel's on fire, and it's rolling down the road. "Our greatest problem", he says, "is the educational problem of getting man to realize in time what his problems are, and what the most effective priorities may be for saving them."

Aristide Esser approaches the problem of unreconciled dichotomies, by defining what he terms the prosthetic brain and the social brain. He maintains that "Human Problems rest on the combined functional states of human aggregates. The problems posed by the evolution of the human modes of living together cannot be solved by the efforts of an individual brain, one person, one genius, no matter how intelli-

gent."[28] He believes that knowledge in the physical sciences is cumulative but that knowledge of human behavior appears multidirectional. He explains this dichotomy of man's relation to his physical environment, as opposed to man's relation to man, as being different processes of evolution for different aspects of the human brain.[29] According to him, "the original function of our individual human brain was to help us survive, and the survival mechanisms can be seen in two parts: that which keeps the body functioning physiologically and that which does this psychologically".[30]

Esser maintains that the prosthetic brain consists of "our emotions, thoughts, and actions as they are crystallized in our physical environment."[31] Although the prosthetic and the social brain began together, the prosthetic brain increased rapidly when man's social aggregates grew rapidly. The computer may be considered an extension of man's prosthetic brain. "The prosthetic brain enabled man to live independently of environmental condition, while the social brain (language) prepared man to live together" in larger groups.[32] Without drawing the full analogy, Esser is telling us that low synergy is the result of ineffective functioning of the social brain (limited to biological evolution) and ineffective functioning of the prosthetic brain (limited to cultural perception). This produces social pollution and further prevents high synergy from developing.[33]

Esser's keen insight is fully supported in an article aptly entitled "Flim-Flam, Double-Talk, and Hustle: The Urban-Problems Industry." After leading us through the maze of uncoordinated Federal, industry and university efforts toward resolving urban problems, the author concludes:[34]

> These conflicting pressures on the consultant's loyalties have impaled the industry on a dilemma from which it has not been able to lift itself on its own power. Somebody outside the industry must do the job. So far, "concerned" foundations and organizations—the Urban Institute. Urban America, the Ford Foundation, the General Accounting Office, the Senate Government Operations Committee, the Department of Housing and Urban Development—have all backed away from funding any inquiry into the industry. They have said that it is not within their mandate or that they cannot knock their competition or that they have on their board of trustees a consultant who would not permit it or that they are afraid of being blacklisted from every government and foundation grant source in the country. But the fact is that the government and the people are not getting the information they need to make sound urban program and policy decisions. Huge amounts of time and money are being wasted; the wrong questions are often asked, the wrong people do the work, and the research is often of questionable quality or usefulness. It would be nice if someone found the time and the courage to

study the studiers, to analyze the analysts, to measure the measurers, and to make some strong recommendations about the recommenders.[35]

Now I have purposefully led you to a global view of high and low synergy organizations. From this holistic perspective and planetary perch, let me swoop down to the individual organization. But first, let me quote Tagore.[36]

> In gradual degrees men became aware that the subtle intricacies of human experience find their perfection in the harmony of interdependence, never in the vigorous exercise of elbows by a mutually pushing multitude, in the arrogant assertion of independence which fitly belongs to the barren rocks and deserts grey with the pallor of death.

I think that Tagore has delivered a powerful message and one that captures the totality of a synergistic organization. For, indeed, it is the combination of energy that produces synergy and the type of combination used determines whether the output is of a high or low order variety.

I believe that high synergy organizations develop around Maslow's Z theory by combining intuitive and pragmatic approaches. I also believe that invariably they develop from matrix arrangements, or largely informal multidisciplinary task teams. I believe that if organizations can prevent rigidity from stifling loose arrangements, a constant source of high level synergy is available. Rigidity in structure and status stratification prevents synergy from emerging or keeps it hidden in organizational reservoirs like so much trapped petroleum. I will not discuss matrix form in this paper since this subject is covered in much detail by others in this seminar.

I do feel that developing high synergy from matrix arrangements requires an understanding of living with and optimizing ambiguity.[37] Fred Massarik observes that "too little ambiguity makes it impossible for individuals and organizational subsystems to 'roll with the punch' of changing ... (because) a dearth of ambiguity promotes conflict (by leaving) no room for potentially opposing individuals or organizational subsystems to back off or to meet halfway, within a no-man's land of functional ambiguity."[38] Massarik maintains that too much ambiguity severly impedes organizational effectiveness "by creating overwhelming anxiety for the individuals and by obscuring guidelines necessary for organizational sirvival". Furthermore, "in terms of *intra*-organizational stress, joint support for an ambiguity state makes it possible for the managers involved to establish appropriate compromises in areas such as task definitions and assumption of responsibility".[39]

The matrix structure helps merge the de facto and de jure, the formal

and informal, the right and the ability to make decisions, and helps organizations to overcome the "trained incapacity" of specialization and the alienation of "functional compartmentalization".[40]

Some healthy developments in industrial engineering are evidenced in a reflent article by Croft and Eldin. They maintain, and I think rightfully, that "The industrial engineer has been forced to re-evaluate his profession. He has become a coordinator of entire systems of men, machines, and money. He has an important role of consolidating the efforts of many others who are responsible for subsystems to be coordinated into a total workable system."[41] Although I might not necessarily agree that the industrial engineer is the only "generalist" who can develop the total system concept, I feel that Croft and Eldin have gone to the heart of the issue—that of overcoming the prison imposed by the rigid boundaries of overspecialization. Thank goodness, industrial engineers are becoming synergistic.

Tom Alexander described the Apollo program as serving two masters. He observes that:[42]

> First developed by the military services in connection with large systems, "projectization" has evolved in Apollo to the point of being a management revolution. It carries to its most elaborate development the "task force" concept now becoming the fashion in management doctrine. Under projectization, a separate Apollo Program Office was established in each of the three government field centers—the Manned Spacecraft Center in Houston, the Marshall Center, at Cape Kennedy—as well as on the premises of the main contractors—North American, Grumman, Boeing, Chrysler, I.B.M., AC Electronics, and McDonnell Douglas. Each program office has positions for such functions as design, schedule, finance, and quality control that parallel those in the main program headquarters in Washington. In effect, these offices form a separate network for command and communication outside the main NASA organization to monitor all Apollo work with respect to schedule, cost, performance, and quality, and, of course, to ensure that all the pieces will indeed fit together when they finally meet for the first time at Cape Kennedy.
>
> But the end result of projectization is an interwoven structure whose lines of responsibility and communication reach out in several directions. It departs from many of the principles of classical management theory, including unity of supervision and responsibility and rigid hierachies of command. Each of the program offices at both the center and contractor organizations must serve two masters, the Apollo program and the organization itself. In case of conflict over directives, appeals are brought to Mueller, who is not only in charge of manned space flight, but is also over-all chief of the three centers as well.[43]

Alexander has told us, in effect, that Apollo was a complex network, a delicate web, influencing the human environment. The dramatic

flight of Apollo 13 fully revealed this. Noel Melnnis captures the essence of understanding the complex high synergy of Apollo in these words. "Man is destroying the delicate web of life because he does not perceive that this environment is, in fact, a web—a complex network of totally interactive beings, forces, and events, wherein stress on one of the strands affects the entire web."[44] When Neil Armstrong stepped on the lunar surface, he demonstrated one of the most, if not the most, comprehensive examples of a synergistic organization the world has seen.[45] The other demonstration of high level synergy is, to me, the *Declaration of Independence* and *The American Constitution*. It is significant that these events, separated by two centuries, are high water marks of American synergy. They reflect what combinations of energy can do when challenged to do so. Edward Hall captures this.[46]

> The relationship between man and the cultural dimension is one in which both man and his environment participate in molding each other. Man is now in the position of actually creating the total world in which he lives... In creating this world he is actually determining what kind of an organism he will be.

The synergistic organization will play the major role in the outcome.

The Apollo program, Fuller's World Game, Maslow's Theory Z, Archibald Rutledge's Santee River Plantation—although vastly different on the surface—are examples of synergy. In fact the Apollo program may be described as the symbolic cutting edge of high synergy organizations.[47] Each of you belong to organizations which have the capability of becoming synergistic. Each of you can choose, or "opt in" as the young would say, and develop synergistic partnerships as a step toward the synergistic organization. I am apeaking to you as one Southerner to others.

For the past 25 years, we have watched Georgia and the entire Southeastern region being transformed. We have seen the South going from Agraria to Industria. Those of you who, like me, began life and reached adulthood in the rural South are acutely aware of this transformation, and recognize that we are now hovering between fixed tradition and undetermined but complete modernization. In referring to developing countries, Fred Riggs describes this stage as the prismatic stage of societal development.[48] There still persists much of "in-group" identification yet, in the larger urban areas, there is such a thorough diversification, that little opportunity remains for traditional in-groups to develop.[49] Perturbations among the Black and White subcommunities, I believe, as we transform, present great challenges and equally great opportunities to focus or synergize this diffused energy

into meaningful goals for Georgia businessmen. Georgia businessmen* and the University of Georgia, with its COSMIC Center, can lead the way by engaging its citizens, Black and White, in active programs. An active society of Whites and Blacks is a more responsive society; and a more responsive society is one which has fewer alienated members.[50] An active society largely determines its destiny. What I am speaking of is not political but rather a commitment to involve people in active life programs. Amitai Etzioni calls it the *Active Society*. The active society mobilizes its citizens to action. The active society provides for synergistic areangements to develop and for synergistic organizations to form. We of the Southeast face a truly glorious opportunity to develop synergistic organizations through new combinations of energy-producing partnerships.[51] But developing synergistic organizations in Georgia and elsewhere is not easy. Lack of experience, and, in our case some strong cultural biases, doesn't help the case. Time is required to develop trust, communication, and commitment, and "these ingredients require a period of gestation".[52] Warren Bennis elaborates, "building synergistic and collaborative structures will become essential. Modern problems are too complex and diversified for one man (one group, one race), or one discipline. They require a blending of skills and perspectives, and only effective problem-solving units will be able to master them."[53]

The Apollo program involved all the ingredients for a synergistic organization—multidisciplinary, commitment, network communication, and a matrix arrangement. The fact that it was able to meets its complex commitment is proof of what a synergistic organization can do. We can say with Jefferson "My God! How little do my countrymen know what precious blessings they are in possession of and which no other people on earth enjoy."[54] We still possess these blessings although one would have to observe that we also face the danger of being renamed the United States of "Polluto".[55] What we do possess in abundance is the ability to mobilize human and non-human resources in a man-machine-man network and a humanistic synergistic arrangement to overcome any of our problems.[56]

It is fitting that I conclude with a statement from Max Lerner. Although speaking from a different context, Lerner has given us a true meaning of synergy in our troubled and changing environment. It is "the human connection, the link that ties man to man".[57]

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* This parer was presented to faculty members of the University of Georgia and Georgia businessmen. Dr. Fremont A. Shull, Tr. served 25 chairman of the symposium.

NOTES

1. Maslow, Abraham H. and Larry P. Gross, "Synergy in the Society and in the Individual". *Journal of Individual Psychology*, **20**, Nov. 1964.
2. *Ibid.*
3. *Ibid.*
4. *Ibid.*
5. "The Sun/Sea Synergism". Hughes Aircraft Corp. VECTORS, Jan. 1970.
6. *Ibid.*
7. Dror, Yehezkel, *A Policy Science View of Future Studies: Alternative Futures and Present Action.* Paper presented at International Future Research Conference, Kyoto, Japan, April 1970. This paper is an excellent summary of policy planning, including the importance of alternatives and even second and third-order consequences to be considered. In effect, an improved way of selecting priorities is offered by Dror. Also see Lasswell Harold, "The Emerging Conceptions of Policy Sciences". *Policy Sciences*, Vol. 1, No. 1, Spring, 1970.
8. Allen, Rex Whitaker, "Comment and Opinion". *AIA Journal*, Nov. 1969.
9. Platt, John R., *The Step to Man.* New York: Wiley, 1966.
10. See Theobald, Robert, Editor, *Social Policies for America in The Seventies.* Garden City, New York: Doubleday, 1968. Also Taviss, Burbank, and Rothschild, *Technology and The City.* Boston: Harvard University Press, 1970. Alan K. Campbell recently brought together some excellent views for new urban/state/regional/national arrangements. Campbell, Ed., *The States and The Urban Crisis.* Englewood Cliffs: Prentice-Hall, 1970.
11. *Ibid.*
12. Stulman, Julius, *Evolving Mankind's Future.* Philadelphia: Lippincott, 1967.
13. Smith, Robert A., III, "The Formed and the Forming". *The Indian Journal of Sociology*, 1970. Also Nishida, Kitaro, *Intelligibility and the Philosophy of Nothingness.* Honolulu: East-West Press, 1966.
14. Likert, Rensis, *The Human Organization: Its Management and Value.* New York: McGraw-Hill, 1967. See also Weisbord, Marvin R., "What, Not Again! Manage People Better?" *Think*, Jan.–Feb. 1970.
15. Maslow, A. H., "Theory Z", *Journal of Transpersonal Psychology*, February 1970. Also to appear in Bennis, Warren G. and Edgar H. Schein, Editors, *New Developments Within the Human Side of Enterprise.* New York: MacGraw-Hill, 1970.
16. Ronald Laing captures these dualities "Consider the metamorphoses that one man may go through in one day as he moves from one mode of sociality to another". Laing, R. D., *The Politics of Experience.* New York: Pantheon Books, 1967. Also see Laing, *Knots.* New York: Patheon, 1970.
17. *Ibid.* Maslow, Arasteh develops similar conclusions. See Arasteh, A. Reza, *Final Integration in the Adult Personality.* Leiden, The Netherlands: E.J. Brill, 1965.
18. Gross, Bertram M., "The Coming General Systems Models of Social Systems". *Human Relations*, November 1967.
19. *Ibid.* Also see Smith, Robert A., III, "Social Systems Analysis and Industrial Humanism". *General Systems*, **XIV**, 1969.

20. One may also want to refer to: Bell, Daniel and Mancur Olsen, Jr., "Toward A Social Report". *The Public Interest*, No. 15, Spring, 1969. **See Moore, Wilbert E., "Global Sociology: The World as a Singular System" *The American Journal of Sociology*, March 1966, for the World View.
21. McHale, John, "The Plastic Parthenon", *Dotzero Magazine*, Spring 1967. Also see McHale, John, *The Future of the Future*. New York: Braziller, 1969.
22. Bertalanffy, Ludwig von, *General Systems Theory*. New York: Braziller, 1968. Also see Whyte, L. L. and D. Wilson, *Hierarchical Systems*. New York: American Elsevier, 1969.
23. McLuhan, H. Marshall, *Understanding Media: The Extension of Man*. New York: McGraw-Hill, 1964.
24. Youngblood, Gene, Los Angeles Free Press, December 19, 1969. Also see Fuller, R. Buckminster, *Operating Manual for Spaceship Earth*. Carpondale: Southern Illinois University Press, 1969.
26. Levy, Marion J., Jr., *Modernization and The Structure of Society: A Setting for International Affairs*. Princeton: Princeton University Press, 1966. Fuller's views could be helpful in keeping modernization from overwhelming idiosyncracies of cultures.
25. *Ibid.* Los Angeles Free Press.
27. The Sprouts have developed an insightful paradigm of global ecology. See Sprout, Harold and Margaret, *An Ecological Paradigm for the Study of International Politics*. Princeton University: Center for International Studies, 1968. See also McGehee, "Well Said-Worth Repeating "Soul Erosion". *The Progressive Farmer*, April 1970.
28. Esser, Aristide H., "Social Pollution: The Evolutionary Lag Between Man's Social and Prosthetic Brain". *AAAS General Symposium, Human Settlements and Environmental Design*, Dec. 28–30, 1969. See also Calhoun, John B., "A Glance into the Garden". Mills College Assembly Series, Mills College, Oakland, California, 1965.
29. *Ibid.* Esser.
30. *Ibid.*
31. *Ibid.*
32. *Ibid.*
33. For a recent overview of general systems and psychiatry along the lines Esser alludes to, see Gray, William and Frederick, J. Duhl and Nicholas D. Rizzo, *General Systems Theory and Psychiatry*. Boston: Little, Brown, 1969. Also see Argyle, Michael, *Social Interaction*. New York: Appleton Century-Crofts, Inc., 1970.
34. Kalish, James A., "Flim-Flam, Double-Talk, and Hustle: The Urban-Problems Industry", *Washington Monthly*, November 1969.
35. A Review of Mumford, Lewis, *The Transformation of Man*. New York: Harper, 1956. Would be a first step in such a study. Also the following provide valuable insights. Grinker, R. R., Editor, *Toward A Unified Theory of Human Behavior*, Second Edition. New York: Basic Books, 1967. And Miller, James G., "Living Systems: Basic Concepts". *Behavioral Science* **10**, 1965.
36. Tagore, Rabindranath, *The Religion of Man*. Boston: Beacon Press, 1961.
37. Ruesch, J. and Bateson, Gregory, Communication, *The Social Matrix of*

Psychiatry, 2nd Ed. New York: Norton, 1967. Also Levi-Straus, Claude, *The Elementary Structures of Kinship*. Boston: Beacon Press, 1970.

38. Massarik, Fred, "Functional Ambiguity and the Cushioning of Organizational Stress". NASA Research Grant Paper, UCLA, 1965.
39. *Ibid.* Also Smith, Robert A., III, "The Matrix Approach to Management and Organization: Making Leadership Democratic and Effective". Internal MSFC Paper, November 1966.
    Matrix form is discussed by Mee, Cleland, and Shull. See:
    Mee, John F., "Matrix Organization". *Business Horizons*, Summer, 1964.
    Shull, Fremont A., Jr., "Matrix Structure and Project Authority for Optimizing Organizational Capacity", Research Paper, Southern Illinois University, October 1965.
    Cleland, David I. and William R. King, *Systems Analysis and Project Management*. New York: McGraw-Hill, 1968.
    Hopeman, Richard J., *Systems Analysis and Operations Management* (Columbus Merrill, 1969).
40. See Sells, S. B., "The Nature of Organizational Climate", in Tagiuri and Litwin, *Organizational Climate*. Boston: Div. of Research, Graduate School of Business Administration, Harvard University, 1968. Also Caldwell, Lynton K., "Health and Homeostasis as Social Concepts: An Exploratory Essay". *Diversity and Stability in Ecological Systems*, Brookhaven Symposia in Biology: No. 22, 1969.
41. Croft, F. Max and Hamed Kamel Eldin, "The Future of Systems and Industrial Engineering". *Proceedings of AIIE National Conference*, Houston, Texas, May 1969.
42. Alexander, Tom, "The Unexpected Payoff of Project Apollo". *Fortune*, July 1969.
43. Dr. George Mueller, Associate Director for Manned Space Flight, left NASA, in December, 1969 after guiding the Apollo Program through the successful lunar landing of Apollo 11.
44. McInnis, Noel, "Gestalt Ecology: How do We Create our Space?" above. See also Platt, John R., "The Two Faces of Perception". *Main Currents in Modern Thought*, **25**, 1, and Vickers, Geoffrey, *Value Systems and Social Process*. New Yoek: Basic Books, 1968.
45. Armstrong's feat demonstrated La Barre's observation about evolution. La Barre maintained that man, unlike animals, has shifted evolution from his body to his extensions and thereby tremendously accelerated the process of human evolution. I believe that a real awareness of this significant fact is essential if we are to keep our evolution within the realm of humanity. See La Barre, Weston, *The Human Animal*. Chicago: University of Chicago Press, 1954.
46. Hall, Edward T., *The Hidden Dimension*. New York: Doubleday & Co., Inc., 1966.
47. Bauer, Raymond A., Editor, *Second-Order Consequences: A Methodological Essay on the Impact of Technology*. Boston: MIT Press, 1969. See also Michael, Donald N., *The Unprepared Society*. New York: Basic Books, 1968. And Martin, Walter T., *The Rural-Urban Fringe: Adjustment to Resident Location*. Eugene, Oregon: University of Oregon Press, 1953. And Gibson, Q. B., *The Logic of Social Enquiry*. London: Routledge & Kegan Paul, 1960.

48. Riggs, Fred W., *Administration in Developing Countries: The Theory of Prismatic Society.* Boston: Houghton-Mifflin Co., 1964. See also Highsaw, Robert B., Editor, *The Deep South in Transformation.* Tuscaloosa: University of Alabama, 1964, and Steward, Julian H., *The Theory of Culture Change.* Urbana: University of Illinois, 1955, and Rubin, Morton, Plantation County. Chapel Hill: University of C. Press, 1951).
49. See Inkeles, Alex, "Making Men Modern: On the Causes and Consequences of Individual Change in Six Developing Countries", *The American Journal of Sociology*, **75**, No. 2, Sept. 1969. Also Morse, E. L., "The Transformation of Foreign Policy: Modernization, Interdependence and Externalization", *World Politics*, April 1970.
50. See McMullen, Roy, *Art, Affluence and Alienation.* New York: Praeger, 1968.
51. Etzioni, Amitai, *The Active Society: A Theory of Societal and Political Processes.* New York: The Free Press, 1968. See also Dror, Yehezkel, *Public Policymaking Reexamined.* San Francisco: Chandler, 1968.
52. Bennis, Warren G. and Philip E. Slater, *The Temporary Society.* New York: Harper & Row, 1968.
53. *Ibid.*
54. Quoted in Dorsey, John M., *American Government: Conscious Self Sovereignty.* Detroit: Center for Health Education, 1969.
55. Lawrence, R. D., *The Poison Makers.* Camden, N.J.: Nelson, 1969. Also Huxley, Aldous, "The Politics of Ecology". In Perrucci and Pilisuk, *The Triple Revolution.* Boston: Little, Brown, 1968. And Graham, Frank, Jr., *Since Silent Spring.* Boston: Houghton Mifflin, 1970.
56. But as Robin Williams states, and, something we should never forget, "A Person-centered society can never bind the future irrevocably". Williams, Robin M., "A Model of Society: The American Case", in Gross, Bertram M., *A Great Society.* New York: Basic Books, 1968. See also Nisbet, Robert A., "The Twilight of Authority", *The Public Interest*, No. 15, Spring, 1969. And Storer, John, *Man in The Web of Life.* New York: New American Library, 1968.
57. Lerner, Max, "On Whose Behalf is the Dream Being Dreamt?" in Ewald, William R., Jr., Editor, *Environment and Change.* Bloomington: Indiana University Press, 1968. See also Altshular, Alan, "New Institutions to Serve the Individual", in Ewald, William R., Jr., Editor, *Environment and Policy.* Bloomington: Indiana University Press, 1968. Altshular's is one of the better treatments of what is required to transform existing institutions into synergistic ones. Two recent articles which bear on this subject and fully worth reading are:
    (1) Terryberry, Shirley, "The Evolution of Organizational Environments", *Administrative Science Quarterly*, March 1968.
    (2) Ericson, Richard F., "The Impact of Cybernetic Information Technology on Management Value Systems", *General Systems*, **XIV**, 1969.

BIBLIOGRAPHY

Allport, Gordon, *The Nature of Prejudice.* Boston: Addison-Wesley, 1954.

Bennis, Warren G., Kenneth, D. Benne, and Robert Chin, *The Planning of Change*, Second Edition. New York: Holt, Rinehart and Winston, 1969.

Berrien, F. Kenneth, *General and Social Systems.* New Brunswick: Rutgers University Press, 1968.

Buckley, Walter, Editor, *Modern Systems Research for the Behavioral Scientist.* Chicago: Aldine, 1968.

Burke, Kenneth, *Permanence and Change.* Indianapolis: Bobbs-Merrill, 1965.

Dahrendorf, Ralf, *Essays in The Theory of Society.* Stanford: Stanford Press, 1968.

Dewey, John and A. F. Bentley, *Knowing and The Known.* Boston: Beacon Press, 1949.

Duncan, Hugh D., *Symbols and Social Theory.* New York: Oxford University Press, 1969.

Golomb, Naphtali and Daniel Katz, *The Kibbutzim as an Open Social System.* Israel: Rupin Institute, 1969.

Koestler and Smythies, Editors, *Beyond Reductionism.* New York: MacMillan, 1970.

Kulski, W. W., *International Politics in A Revolutionary Age*, second Edition. Philadelphia: Lippincott, 1970.

Phillips, John L., Jr., *The Origins of Intellect: Piaget's Theory.* San Francisco: Freeman, 1969.

Simon, Herbert A., *The Sciences of the Artificial.* Boston: MIT Press, 1969.

Thompson, Victor A., *Bureaucracy and Innovation.* Tuscaloosa: University of Alabama Press, 1969.

Tumin, Melvin M., *Social Stratifications: The Functions of Inequality.* Englewood Cliffs: Prentice-Hall, 1967; and "Violence and Democracy", *Dissent*, July–August 1970.

Van den Berghe, Pierre L., *Race and Racism.* New York: John Wiley & Sons, 1967.

Vickers, Geoffrey, *The Art of Judgement.* New York: Basic Books, 1965.

Vroom, Victor H., Editor, *Methods of Organizational Change.* Pittsburgh: University of Pittsburgh Press, 1967.

Ward, Barbara, *Spaceship Earth.* New York: Columbia University Press, 1966.

Whyte, Lancelot Law, Albert Wilson and Donna Wilson, Editors, *Hierarchical Systems.* New York: American Elsevier, 1969.

Whorf, Benjamin Lee, *Language, Thought and Reality.* Boston: MIT, 1964.

Wilinsky, Harold, *Organizational Intelligence.* New York: Basic Book, 1967.

Wilkins, *Social Deviance.* London: Tavistock, 1964.

Williams, Robin M., Jr., *American Society.* New York: Knopf, 1960.

Yinger, J. Milton, "Contraculture and Subculture", *American Sociological Review*, 1960, **25**.

Zawodny, J. K., Editor, *Man and International Relations: Contributions of the Social Sciences to Conflict and Integration.* San Francisco: Chandler Publishing Co., 1966.

Zwicky and Wilson, Editors, *New Methods of Thought and Procedures.* New York: Springer-Verlag, 1967.

PART THREE

MAN AND UNIVERSE

9

The Cosmic Lens, the Galactic Disc, and Archetypal Holograms

OLIVER L. REISER*

It is wonderful to fly by night among the shooting stars
Gliding along the moonbeam rays, seeking a road to Mars;
But when the shining planets dim, and the Milky Way turns bright
... Left up in space with god alone, I tell you it is Heaven!

I. A COSMIC HUMANISM EMERGES

In years gone by the writer sailed under the banner of "Scientific Humanism". Individuals in this "movement" included a number of thinkers, the best known is Sir Julian Huxley. Later on this philosophical development was joined by some who, in their attitude toward "religion", were either "agnostics" or "atheists". This, of course, was (and is) their prerogative and we do not quarrel with their right to that variety of what is now termed "secular humanism".

But because my own world-view has taken on an increasing impetus toward a Pantheism reminiscent of the philosophy of Pythagoras, Giordano Bruno, Spinoza, and Einstein—to mention only a few—I have found the label of Scientific Humanism less and less satisfactory. When Dr. Charles Francis Potter proposed the term *Cosmic Humanism* as a proper label for the philosophy of Albert Einstein, I adopted this immediately as the best term to designate my own world-view—especially after Dr. Einstein assured me (by letter) that "your view is very

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close to my own". Now, however, this philosophy needs to be "modernized" at some points, and this is what I am here attempting to do.

Most philosophers today have little interest in a revival of Pantheism as a cosmology. But for some of us, the so-called radical theology of the "Death of God" is as superficial as the obsolete anthropomorphic notion of God. This is mere negativism. However that may be, from here on in my own efforts at the "integration of human knowledge" will be devoted to establishing Cosmic Humanism as the best substitute for the outmoded theistic viewpoints. Henceforth, and as a part of the program of a "creative semantics", I shall avoid the use of the term "God", so far as possible, and speak of the *Supreme Imagination* and the *Cosmic Lens* as the appropriate realities of this developing form of Cosmic Humanism.

There are many facets to this world-view. It involves an epistemology, a physics and astronomy, a theory of biological evolution, a theory of the nature of man, and an ethics and a political philosophy. My special concern on this occasion is to explain and justify, if I can, the "cosmic" part of this compound word. This cannot be an easy task, especially since, for the sake of brevity, I must be selective.

One way to provide the broader frame of reference for the great human adventure on this planet is to relate man to the galaxy—the *Via Lactea* of Dante's Divine Comedy—and this is the path I shall follow in a moment. But first let me say something about the all-embracing physical foundations that are proposed.

II. THE CYCLIC-CREATIVE COSMOLOGY

The cosmology here advanced was first presented in some detail in my *Scientia* article[1] of 1954, "The Field Theory of Matter in a Pantheistic Cosmology". These ideas were later amplified in the two books, *The Integration of Human Knowledge* (1958), and *Cosmic Humanism* (1966). Here my own interpretation of the "energetic theory" was elaborated. A number of other students were also working out ideas along these lines. Among such was Mr. Julius Stulman and my familiarity with, and reaction to, his views are recorded in the volumes just mentioned.

My own philosophy has been designated as a "monism of action", where action is energy integrated through time. All entities of the physical world emerge from the *Cosmic Field of Energy*—infinite, eternal, uncreated. "Elementary particles" are regarded as nodes of energy; and more complex aggregates of matter are syntheses of what Hermann

Weyl termed the "substance-action of electricity". The Cosmic Field is outside of the "manifest world", i.e., outside all finite coordinate systems of space-time-matter configurations of physics and astronomy, so that the laws of the "unmanifest world" are transposable across the various levels of material organizations. Like "public time", the laws are invariant *gestalt* properties. This, I assume, is why Dr. Henry Margenau has proposed the term *Logos Field.*

For the cosmos as a whole—galaxies, metagalaxies, and so on up the hierarchy—the Cosmic Imagination supplies the guiding fields for the emergence of atomic hydrogen in the cosmic feedback between matter

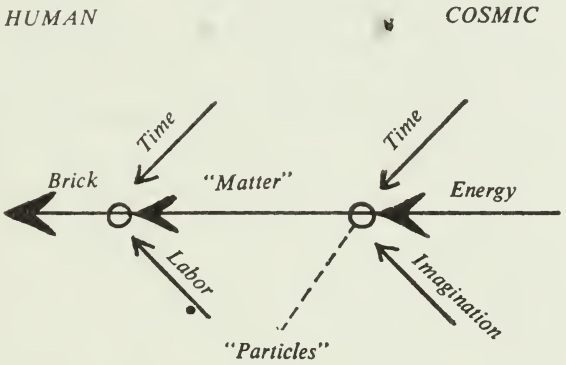

FIGURE 9:1 Making a Product

and energy. And within this manifest world the Supreme Imagination supplies the thrust ("impulse energy tensors") behind the evolution of the logarithmic spiral forms that appear as the "rungs" of the ladder of emergent evolution. The Cosmic Imagination has its lower level analogue in human imagination as the creative factor in fashioning products. The homomorphism between the human and the cosmic is brought out in the following diagram, MAKING A PRODUCT. This diagram should be associated with the diagram MAKING A UNIVERSE.

In both diagrams configurations of matter are viewed as bound energy patterns, i.e., repeating themselves in the same regions of the fields, like "standing waves", with *inertia* as the property of resistance to further change or transformation. The massless energy of imagination (cosmic and human) must work against the "rest mass" energy. Thus "matter" with *mass* and *inertia* expresses what has already been achieved or stabilized. In brief, in Cosmic Humanism the Supreme Imagination is the Original or Unbegotten Energy that creates pro-

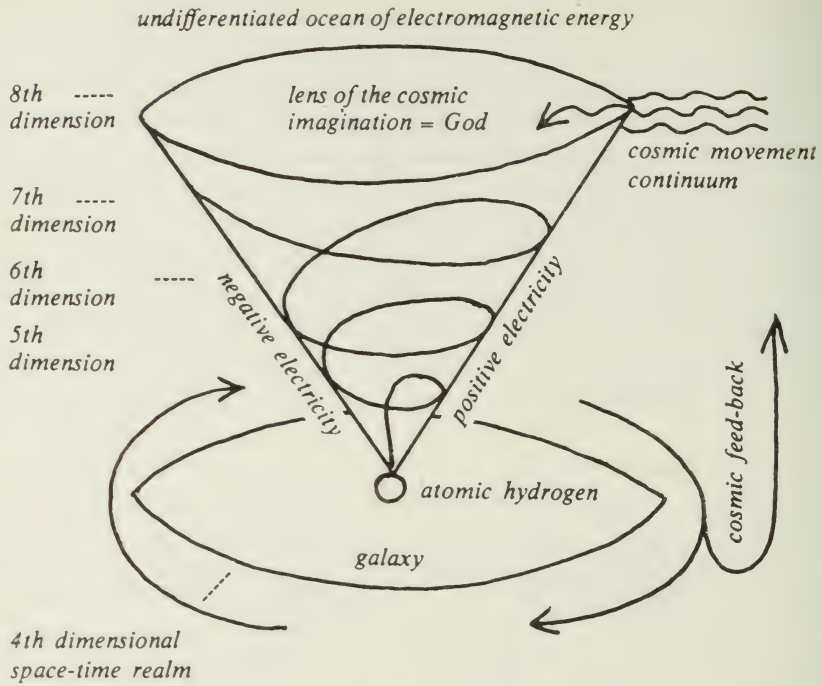

DIAGRAM II

Cosmic Field Energy is converted into particles, which are made in pairs as enantiomorphic or mirror images, which yields cosmic symmetry for strong forces:

Protons — Anti-protons
Positrons — Electrons
Neutrons — Anti-neutrons
Neutrinos—Anti-neutrinos

A galactic spiral is a huge cyclotron, the rotation of which acts as a giant accelerator that generates cosmic rays, according to Enrico Fermi and Bruno Rossi. In the Cyclic-Creative cosmology the spiral galaxy has an Eye or Lens through which the Cosmic Imagination visualizes matter (atomic hydrogen) into existence.

It takes eight dimensions to MAKE A UNIVERSE: four above the four-dimensional space-time continuum of general relativity theory. "Particles" are spiraloids of energy which are tied in nodal points of entry in the space-time of the manifest world.

FIGURE 9:2 Making a Universe. The above diagram is a modification of the original diagram which first appeared in the article "The Evolution of Cosmologies", and now Figure 1 of the present article. In the above diagram the Cosmic Lens has been rotated from the vertical to the horizontal position

ducts, man included, not *ex nihilo*, but in accordance with Einstein's formula for the equivalence of matter and energy, $E = m \cdot c^2$.

Recently a Soviet scientist, Dr. Nikolai Kozyrev, startled the scientific world with his astonishing idea about *time as a form of energy*. This new concept is set forth in the chapter on "Time—A New Frontier of the Mind", in the volume on *Psychic Discoveries Behind the Iron Curtain* (1970). This is an important contribution to the philosophy of science because, among other things, it promises to help man understand and explain the phenomena of para-psychology. Interestingly enough, Winifred Babcock, official expositor of the philosophy of the deceased and unknown author, "Preston Harold", sees many similarities between Dr. Kozyrev's views and those of Preston Harold as these are set forth in his essay, "On the Nature of Universal Cross-Action", which is included in the volume, *The Single Reality* (1971), by Winifred Babcock, Robert M. L. Baker, Jr., Preston Harold, and Oliver Reiser. These parallels will be explored in detail and made exact by Winifred Babcock in her future publications.

These original ideas do not call for a radical revision of my own energic theory of reality, as may be indicated briefly. But before that, it may be pointed out that Dr. Kozyrev's notion of "time-energy" might be thought of as corresponding rather well with the "Cosmic Imagination"—both being outside the "time" of any special reference frame and acting as the morphogenetic agency for synthesis in and among physical aggregates *in the manifest world.*

In our cyclic-creative cosmology we have proposed that time in the manifest world is not an objectively invariant thing-in-itself. "Time" is a manifestation of the flow of ordered patterns in fields of energy. These groups of rhythms are measurable in quantitative terms as multiples of *Planck's constants* as expressed in the quantum theory of energy. These cycles are responsible for the time-binding that emerges in the "rhyming of energies" octaves. Time measurements are energy units of one sort (x-rays; electromagnetic waves; infra-red radiation; light and sound waves; phonon waves; etc.) related to energy units within the more inclusive frames wherein subcycles of group patterned energies are discriminated.

In the external environment the earth's cycles as measured by clocks and calendars, and the solar and sidereal cycles (e.g., "summer constellations" and "winter constellations"), are of most importance for man. Within man, biological and psychological time rhythms (Bergson's *durée*) are significant. But all cycles are manifestations of "fields within fields...", to use Julius Stulman's happy phrase.

III. ASTRONOMICAL PHENOMENOLOGY

Now it is necessary to choose one or two domains for a more specific application of the foregoing general principles. I shall select the problem area of astrology in relation to the developing philosophy of Cosmic Humanism. This involves also the difficult question of the origin and nature of human consciousness.

In view of the present considerable interest in astrology, it seems pertinent that we consider the validity of the claims made by the astrologers concerning the influence of star clusters (the "signs of the zodiac") on human affairs. In that connection we will ponder the problem of harmonizing the "truths" of astrological doctrine with the main tenets of Cosmic Humanism. In previous writings I have expressed opinions about "galactic influences", but these studies in the field of "cosmecology" were not directed toward the controversial doctrines of astrology. Here, then, are some tentative conclusions aimed at working out an integrated point of view. It turns out that in order to present this, it is also essential that we introduce some collateral formulations about the "hierarchical universe", an hypothesis that occupies an important place in our world-view.

As an integral part of this cosmology, we have also urged that the "archetypal forms" that act as the guiding fields are resident in the Cosmic Field, and as such they are outside and above all finite reference frames of the manifest world of physics. So much, then, by way of clarifying the background of our cinerama.

My first thesis relative to this problem is to make clear that *if we are to discover a connection between the twelve configurations ("signs") of the zodiac of astrology and any corresponding realities in our cosmic humanism, it will have to come by way of establishing that our spiral galaxy, with its zodiacal configurations, is in fact our own postulated Cosmic Lens.* This is the next step.

In developing our viewpoint, it is necessary to state and accept two general principles: (1) In our cosmology the galactic disc (Lens) must be treated as a whole, a cosmic gestalt, with no special status or influence assigned to the traditional twelve (or fourteen) "signs of the zodiac". (2) The level at which these influences are transmitted and the mechanisms whereby they are transmitted are related to the medium wherein nuclear and atomic forces operate. If this is correct, these influences are not within the range of frequencies associated with upper macroscopic levels. Moreover, they come from various parts of the galaxy to influx the earth and the solar system. We posit that the bands

of frequencies of galactic field influences is within the medium or plasma of what we have termed the *Psi*-field or *Psychosphere*.

In order to theorize within the limits of the two foregoing principles, and at the same time to move toward the hoped-for synthesis, it is necessary for me to return to the ideas conveyed to me by Dr. Andrija Puharich. This takes us into the field of nuclear physics as applied to biological phenomena.

Working together on this, Dr. Puharich and the writer now propose the hypothesis that quantized spin states in biophysical systems are the source of "information", so that in human beings the signal detection system is to be found at the atomic level (not the molecular level) in the hydrogen bonds that are suspended in the protein C=O—H—N system. On this foundational level, therefore, the explanation of coherence in terms of magnetic moments, orientations, and polarizations, is provided by the elements of atomic spin, precession, and the like.

So much for the biophysical basis. Next, moving out to the wider cosmic system, we note that over 90% of the galaxy is composed of hydrogen. This hydrogen is fairly evenly distributed throughout our Milky Way, our galactic disc, so that in reality *we human beings live in a cosmic galactic field.* Given that, the quantized spin orientation of the protons of the field and their various states in geometrical configurations may provide the equivalent of the Lens of the Cosmic Imagination, which, surprisingly enough, can use this mechanism to influence events in biological systems here on the earth. At this point the phenomenology of our spiral galaxy begins to resemble one aspect of the supposed influences of astrological configurations. Here, if anywhere, is the place where the zodiac of astrology finds its place in a Cosmic Humanism.

To tighten the nexus, let us turn once more to the source of hydrogen atoms in the spiral disc (galactic lens). The astrophysicists tell us that hydrogen pours into the center of the rotating galaxy (in the region of the constellation Sagittarius). The hydrogen spurts out from the core and takes the form of the S-shaped pattern of the spiral arms. Something remarkable is happening in the galaxy's nucleus to replenish the hydrogen clouds and also transmute hydrogen into helium. What happens here, it has been suggested, may transcend presently known laws of physics. This "rain of hydrogen" may be related to the galactic halo, and this then reminds one of Sir James H. Jeans's suggestion that the matter (hydrogen) comes from outside the galaxy—from a higher dimension. This remarkable surmise is mentioned in the article by G. de Voucoulers[3], "The Case for a Hierarchical Cosmology". This

problem is also discussed in articles in the Symposium, *Hierarchical Structures* (Elsevier Pub. Co., New York, 1969). The article by Dr. Albert Wilson, "Hierarchical Structures in the Cosmos", is especially helpful.

My own excursions into higher order galaxies (metagalaxies and beyond) lead me to explore the possibility of a hierarchy of cosmic lenses, in a ladder of higher dimensionalities. My first defense of the hierarchical universe was presented in the *Scientia* article, and then repeated in subsequent publications. It seems to me that new discoveries in astrophysics have tended to strengthen the case for this cosmology. For example, the new ideas advanced by Dr. John Weber relative to the inner core of the galaxy may be appealed to as lending support to the concept of the hierarchical universe with a hierarchy of cosmic lenses.[4]

In connection with his own research, Dr. Weber raises the question of what could be the significance of the gravitational radiation that emanates from the center of the galaxy. Keeping in mind that Einstein's general theory of relativity predicts that gravitational waves should be produced by matter that is accelerating with respect to the observer, Dr. Weber suggests that "matter" in the center of the galaxy is either collapsing or being rearranged on a grand scale. For me, of course, this tends to confirm our hypothesis that matter and/or energy is (are) being poured into the center of the galaxy from a higher dimension (as Jeans proposed)—of the metagalaxy, for us—and that the next higher "cosmic lens" is playing the role of the focusing agency.

Quite obviously, the idea of a hierarchical system of systems introduces some terribly recondite problems. A cosmos of eight dimensions is called for to comprehend the whole of reality—that is, matter, life, mind, and spirit. What "emerges" in such a scheme are the "phenomena" on the various levels; but the dimensions themselves are everlasting. Some critics have chided me for this plethora of dimensions—"having a lot of loose dimensions rattling about", as one critic put it. The dimensions themselves are unbegotten, eternal, and interpenetrating; they are not "loose". In order to understand how to pass from the fourth to the fifth dimensions—and so on up (or down) the rungs of the ladder of the hierarchical order—it is necessary to utilize the tools and techniques of differential geometry, toroidal topologies ("doughnuts"), and especially the mathematical concept of *circumversion*, all these being important in "rounding the curves of dimensionalities".

This is a difficult business. Here is where others can give me assistance ... and even more so when the job is to escalate from the atomic

to the molecular level to the cellular level, *and then look upward to the coming super-organic realm of the World Sensorium.* To be sure, as we ascend in levels of complexity there is increasing interaction between the component parts. The end result of the dialectic of the *thesis-anti-thesis-synthesis* pattern is *transcendence.* But rather than the stale, flat, and unprofitable "conflict of opposites" of the Marxist dialectic *(Diamat),* with nothing better in sight than the "classless society" of Communism the Cosmic Humanist envisions that the wires (neural fibers) of the rotating earth-armature are spinning out the electromagnetic pattern of the coming planetary society. Strange to say, this archetype is "laid up in heaven"—literally. As previously argued at some length, this means that the next step in the evolution of a Cosmic Humanism is the embryogenesis of the *Psychosphere,* and here the morphogenetic guiding field is the *Psi*-field, beyond the earth's *ionosphere,* and involves the *magnetosphere.* Here the "life" and "mind" properties of the planet's *Heliosphere* will come into play. All this will be set forth in my next volume, *Cosmic Humanism and World Unity.*

Some additions to the present cosmology were made possible—even mandatory—by the recently announced discovery by Soviet scientists of antihelium atoms. This has led me to reconsider some of my earlier speculations as set forth in the article, "Matter, Anti-Matter, and Cosmic Symmetry".[5] For some time I have been fascinated by the idea that "antimatter" may turn out to be energy-knots one dimension higher (or lower) than the corresponding "particles". That is, a proton (positively charged particle) is one dimension lower (or higher) than the corresponding antiparticle (antiproton, in this case) in the spiral of energy that descends from the Cosmic Lens. The one is like the mirror image of the other in the clockwise-counterclockwise system of rotations. This can be visualized in Diagram II. The "elementary particle" reversal would be somewhat analogous to the field-reversal of the earth's magnetic field, except that here the geomagnetics is all on one level of observation.

Possibly some additional plausibility can be given this far–out conjecture that a positive charge in one dimension can appear as a negative charge in the next (adjacent) dimension by recalling Henry Margenau's recapitulation of the idea of "Causality in Quantum Electrodynamics" (cf. *Diogenes,* Spring, 1950, No. 6), where he interpolates the unorthodox notion that "the world line of an electron moving backwards in time represents a positron moving forward". If we may interpret the "forward" and "backward" as designating "clockwise" and "counterclockwise" directions in the spiraloid of energy, resulting

from the ascent or descent in dimensionality of the boundary singularity, we might unify the two views. But in our hypothesis this requires hyperdimensional manifolds.

Knowledgeable physicists are working with fifth and sixth dimensional constructs. More are available. As indicated, the difficulty with our own enantiomorphic (mirror image) explanation of the particle-antiparticle symmetry is that both do in fact exist on the same level of observation, and that is in the "manifest" world. But perhaps this difficulty can be overcome.

Recently Fred Hoyle proposed (cf. *Nature*, Nov. 1, 1969) that matter and antimatter particles are generated in equal amounts in the core of galaxies, but that our part of the universe is made of matter while the antimatter remains in the nucleus of the galaxy. This preserves the symmetry of matter and antimatter, but it leaves the real mystery unsolved—the origin of the two kinds of atoms, especially difficult if one believes in creation *ex nihilo*. If, however, our cosmology is on the right track, it may be possible to work out a theory of how spiraloids of energy involved in the creation of matter from the Cosmic Field of Energy come in at the top of the core of the galactic disc, while the energy that counterspirals into antimatter enters from the bottom of the nucleus of the spiral galaxy. But for some reason they do not enter in the same ratio. How these energy-knots that materialize as hydrogen and then transmute into helium are linked to the more inclusive metagalaxy of the hierarchical cosmos is a major unsolved problem. Perhaps this is "circumversion" of a "toroid" ("doughnut") on a much vaster scale.

IV. ARCHETYPES AS PLATONIC HOLOGRAMS

Returning for a moment to astrological mythology, let us recall that one article of faith in this belief system has to do with the supposed influence of "heavenly patterns" on human affairs, an influence which emanates from the twelve (or fourteen) "signs" of the zodiac. This conjectural causal nexus assigns a negligible role to the other 69 configurations (81 – 12 = 69). Aside from that "discrimination", the critic of astrology will also insist that the very idea of "signs" is preposterous—such "configurations" are nothing other than projections of subjective images into the mythological "signs". For example, *Taurus* no more resembles a "bull" than *Leo* looks like a "lion".

However, the question persists: is it possible that, behind both

"images"—subjective and objective—there is a kind of Platonic archetype that serves as the morphogenetic force-field in the galactic disc and in man? Whatever the answer, it is clear that our galactic phenomenology must be free from the restrictive coercions of the ancient "twelve signs" paradigm.

To find the answer to this question, let us return to the fact that most of the matter of the galaxy is made of hydrogen, some of which is then transmuted into helium. The hydrogen is fairly evenly distributed, so that in reality *we human beings live in a cosmic hydrogen-helium field or plasma.* Knowing this, and recalling Dr. Puharich's hypothesis concerning the role of the quantized spin orientations of the protons in this field and their polarized states in geometrical configurations, we reiterate that we may have here the equivalent of the Lens of the Cosmic Imagination, which may utilize the galactic disc dynamics to influence events in our solar system, including our own planet earth.

If the general thesis is correct that quantized spin states in biophysical systems are the basis for information per se, then in human beings the signal detection system is to be found at the atomic level in the hydrogen protons that are suspended in the protein C=O—H—N system, *the hydrogen bonding system.* Thus, to repeat, the foundation is provided by spin, precession, and the like, of atomic constituents with respect to orientations, magnetic moments, and polarizations. But observe: since biological systems incorporate only levo-rotary amino acids in their proteins (and this includes *DNA* and *RNA*), this biological "bias" must indicate a force-field influence of a higher order. This, we surmise, may reflect a hyper-dimensional influence or guiding field, i.e., more "fields within fields..."

V. THE PSYCHOSPHERE

If in biophysical systems—including the human brain—spin, precession, and angular momentum exhibit coherence with respect to orientation, magnetic moments, and polarization, then the analogy in the human brain in action, as in visualizations, would be a laser hologram. Suggestions along this line will be found in the article, "Information Processing in the Nervous System", *Science*, Vol. 164, 1969, 457–458. Carrying these ideas still further, we might speculate that there would also be a parallelism between the domain of matter as particles, atoms, molecules, and macromolecules, and the domain of mind as percepts, concepts, and higher mental organizations. These latter are a function

of the complexity of interference patterns. And in a broader way there would also be a complementarity between the corpuscular aspects and the wave (spiraloid) aspects of emergent evolution—from the "inorganic" to the "organic" to the "super-organic".

If, on the human level, we can "synchronize the power of resonant thought", we can get human minds to focus on the problem of the future evolution of consciousness, and we might then come up with the correct "interference pattern" and in time create a lovely Platonic Hologram. In that day we will be able to write the score and the equations for the symphony of wave actions that course through man from the spin precessions of the lowest level electrons within himself to the plasma waves that originate in the galactic system which, sooner or later (probably both), act in and through mankind.

In this formulation Dr. Puharich does not deal with the *World Sensorium* as an emergent from the Helium Psychosphere. In my own earlier view, developed in collaboration with suggestions presented to me by Andrew A. Cochran, it was conjectured that the other pole of human consciousness, outside the cerebral cortex, was the circumglobal helium layer. Part of the evidence for this, and abundant quotations from Mr. Cochran's letters to me are presented in my part of the symposium on *The Single Reality* (1971). A diagram of the earth's heliosphere appears in my book, *Cosmic Humanism* (p. 434). This bipolar resonance supposedly was responsible for the emergence of human consciousness. Now, by relating the psychodynamics of consciousness to the galaxy's helium-hydrogen plasma, we seem to have rendered superfluous the earth's heliosphere as the vehicle of feed-back circuitry between the brain, as one pole, and the planet's outer pulsing belt as the other pole. Perhaps a synthesis is possible. In any case, we here envision the Psychosphere as extending beyond the circumglobal magnetosphere to diffusely circumscribe the galactic disc. Here again we have Stulman's *Fields Within Fields*... The morphogenetic guiding fields supply the archetypes for cosmic evolution—even to the appearance of EMERGENT MAN.

The theme of UNIBUTZ, as presented by Robert A. Smith, III*, is a vision of man's journey into the celestial systems of outer space. But there are two ways in which this "reunion" of man and the cosmos can come about: in the first place, by astronauts journeying into the wider world of stellar and planetary systems; and secondly, by man staying where he is, here on the earth, and learning to resonate with

* Cf. below (eds.).

the rhythms and pulsations of the cybernetic feed-backs which build up the *psi*-field potentials in the hydrogen-helium plasma. Perhaps the two will go along together.

In that day the "archetypal hologram" will manifest itself as a visualization of the *Cosmic Imagination*. This is the full meaning of what was projected in my essay on "Cosmecology".[6] The message is clear and simple; out of the galaxy man is born; by the light of the galaxy man lives his life; and to the galaxy he will return. This is the samsara of EMERGENT MAN's celestial voyage. *Therefore, Ad Astra, Unibutz!*

REFERENCES

1. Cf. "The Field Theory of Matter In a Pantheistic Cosmology", by O. L. Reiser; *Scientia*, **89**, 1954, No. 7 (212–218) and No. 8 (251–259).
2. See the article, "Time—A New Frontier of the Mind", by Dr. Nikolai Kozyrev, in the volume, *Psychic Discoveries Behind the Iron Curtain*, by Sheila Ostrander and Lynn Schroeder, Prentice-Hall, 1970.
3. Cf. "The Case for a Hierarchical Cosmology", by G. de Voucoulers; *Science*, **167**, 1970, 1203–1213.
4. See the Editorial, "Things That Go Bump", *Scientific American*, *222*, 1970 (March); and "Gravitational Waves", *Science*, Vol. **167**, 1970, 1237–1239.
5. Cf. "Matter, Anti-Matter, and Cosmic Symmetry", by O. L. Reiser, *Philosophy of Science*, **24**, 1957, 271–274.
6. Cf. "Cosmology: A Theory of Evolution", by O. L. Reiser, *Journal of Heredity*, **28**, 1937, 367–371.

10

Unibutz: The One and the Many in the Search for Peace A Proposal for an Interplanetary Voyage and Settlement

ROBERT A. SMITH, III*

THE IDEA of a "Unibutz" (an interplanetary and international Kibbutz) has been developed in my mind over the past decade. I believe that Tagore's *The Religion of Man* initially challenged me to seek ways of achieving the interdependence he discovered and voiced in these descriptive yet haunting words:[1]

> In gradual degrees men became aware that the subtle intricacies of human existence find their perfection in the harmony of interdependence, never in the vigorous exercise of elbows by a mutually pushing multitude, in the arrogant assertion of independence which fitly belongs to the barren rocks and deserts grey with the pallor of death.

For me, Tagore's powerful message captures the essence of our world's longing no less than its urgent need. Others have said this in different words.

Some several months prior to his death Abraham Maslow sent me copies of some of Ruth Benedict's and his own significant material. Benedict's description of high synergy was *societies where non-aggression is conspicuous have social orders in which the individual by the same act and at the same time serves his own advantage and that of the group.*[2] She observed that this occurs when social arrangements make the individual and

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social requirements identical, or as Dorothy Lee observed in her *Freedom and Culture* when "We ... reconcile principles of conformity and individual initiative, group living and private freedom of choice, social regulation and personal autonomy."[3]

Too, as John Bennett points out, "It is only within the last decade that evolution and involution, syntropy and entropy, have been seen as correlative processes in all departments of nature, including man himself."[4] Syntropy, like synergy, is a combination of energy buildup and where the whole cannot be predicted by any one of its parts—but, as Bennett states, it is a correlative process with entropy—that is, "The growth of the tree [like man] depends upon energy exchanges that are entropic and ends in exhaustion and death. The photo-synthetic process in the leaves is syntropic and, with the return of the sap, renews the life of the tree. The point of the tree symbol is that life and death are inextricable: living is dying and dying is living."[5] The forming is always to the formed as the past and future are to the present, and this is what we are talking about, the forming of the eternal now where the past of our experiences constantly shakes hands with the future of our visions. We seek the universal monad—that rare individual in the middle of a see-saw linking the polar continuum of Bennis' "organic populist" with McLuhan's global dramatist, and the orchestrating of a World Chorus through a Lecuona's latin rhythm blended with Viennese overtones—the bongo drums finding harmony with the reeds, strings, and brass—the pulsations of Aimee Cesare's poetry interpreted by an earthy ballerina where the flesh of the flesh of the world throbs with every movement of the universe in cosmic awareness and identification. Or, as Ben-Yosef says, Man's "radiating mind is a kind of transmuted and re-caught-up speck of the original universe-radiation".[6]

Oliver Reiser has expressed some of these feelings in his proposal for two U.N. satellites appropriately named Prometheus and Krishna. These satellites would be a co-venture of nations through the U.N. and would help to make knowledge and understanding available to the peoples of the earth without the taint of force, ideology or nationalism. Reiser concludes that such a venture "offers itself as an emerging philosophy of synthesis, a social lens to focus and unify human vision, thus giving coherent form to collective aspirations and purposes".[7] What a marvelous and early attainable goal for man. Julius Stulman maintains that although brilliant individuals emerge, a new synergetic methodology is required. He describes it as:[8]

> A new methodology for thinking that leads us from the singular viewpoint to a system of thinking, from system to an organization of systems to

synthesis, and from synthesis ultimately into metamorphosis—in other words a methodology of integrated thought and action in which there is continuing feedback and flow forward to deal with constant changes at all levels.

Stulman is also instrumental and pragmatic in organizing a World Institute Council for the purpose of establishing a World Institute. Harold Lasswell and, more recently, Secretary-General of the U.N., U Thant, and Oliver Reiser have proposed a World University. And there is developing a world peace movement among educators the world over. Global television is greatly responsible for these integrating and unification movements. As Gene Youngblood points out; "The World's not a stage, it's a TV documentary. Television extends global man throughout the ecological biosphere twenty-four hours a day."[9] And, in Marshall McLuhan's view, "by involving all men deeply in one another, [it] will come to reject ... mechanical solutions", as the sole method of resolving our problems.[10] In other words, according to John McHale, "The conceptual extension is towards a planetary ecology which assumes that its prior concern is the maintenance of a planetary society... The approach [considers] the planet and its society as an ecological whole."[11] Buckminster Fuller forcefully points out that the great sea adventurers thought in terms of a world whole and were, therefore, able to commandeer the forces of specialists.[12] Specialization has its place as a device for specific research and experimental isolation but specialization must never be an end in itself. It is "Synthesis—seeing things together, in their interrelations and as a whole—is the goal of understanding. What we now need is a universal conviction that we are studying a unified cosmos, a dynamic and evolving universe."[13] No doubt this will require "A faith in the intelligibility of social evolution (as) necessary to the stabilization of the world of the future."[14] Ferkiss wisely observes that "the whole shapes itself. This is the meaning of the new immanentism".[15] But this also means that man, as a whole man, must be the subject and when this is the case it "leads unmistakably to the science of understanding".[16]

Futurist Arthur Clarke's timetable calls for colonization of planets by the year 2000, with planetary landings taking place in the 1980's and "cyborgs" or cybernetic organisms (men with cybernetic transplants or organs) being developed in the 1990's.[17] For obvious reasons, my timetable for a Unibutz will coincide with Clarke's colonization date. He is an experienced and, to date, a highly accurate forecaster in technology. I only attempt to develop emergent models of man and society in a technological age—not to forecast technological advance. The first millenium A.D. began with a star—the second somewhat lost

sight of the star—and the third under Aquarius could very well see come to pass the democracy of the Manger on the star.

There is yet another fundamental reason for selecting the year 2000. Bucky Fuller sums this up for us:[18]

> There is a trending of the computer development which is swiftly accelerating phase of human ecology evolution. In order to understand the logistical evolution of human artifacts and their sum-total feedback transforming effects on human ecology's total environmental transition and the latter's reciprocal modification of man's evolutionary patterning in universe, you have to recognize that the computer can choose to do only what man can choose to do within the limits of variables of mathematical strategy. There are two strategically fundamental and diametric operations of the mathematics. One is differentiating out, and the other is integrating. Differentiation and integration—those are really the two great diametric limit functions. Those who are expert in the development of the computer point out that it is very clear that the computer is already making man obsolete as a differentiator, that is as a "specialist". The computer and its very sensitive controlling subsidiary organisms which we call automation can very clearly pick out the green from the red and pick it out very much faster than the human can pick it out. It can do it all night long at 2000 degrees heat, where the human can't operate at all. So the machine as computer—as automation—is about to make man extinct as a specialist.
>
> The other—diametric—function of the computer is integration. And the probability is that the computer and its subsidiary automation will not make man obsolete as an integrator for several million years—possibly never. We introduce great complexities into integration, many variables, and the interrelationships of which we wish to comprehend, and that is what the human mind is doing all the time. I can tell you quickly why the computer is never, or not for a long time, going to displace man as the integrator. The total variables that we deal with integratively all deal with a series of original questions which we have asked ourselves. Furthermore, those original questions and their discovered answers are relayed from generation to generation by chromosomic instructions which implement our appropriate, survival-accomplishing, subconscious reflexing to myriad variations of environment stimuli.

And as Fuller concludes; the computer will never replace man as integrator although it will perform his differentiation to a great extent and help to overcome the deadly effects of human overspecialization. The computer can very well become a leading agent for social change by freeing man to become human and comprehensive and to have the leisure to do so.

As Harold Innis observed, technology has undermined both space and time, and history as well as geography.[19] Long-fixed boundaries were made permeable and this has become a frightful threat for both technological and non-technical existentialists and no doubt accounts

for the profound search for community as well as the pell-mell rush for privacy currently underway and so vividly described by Philip Slater.[20] And so the proposal of a Unibutz will provide community and all its meaning of organic interdependence as well as the essential privacy such a community needs plus the advantage of being able to open its boundaries while in a closed system process. For while enroute, these planetary settlers would be in the temporary society of no-man's land of social transformation and could actively pursue Etzioni's active society while in the process of transforming.[21] In Allport's and Carl Roger's terminology, they would be in the process of being and becoming at the same time.[22] Too, they could concentrate on beliefs, attitudes, and values.[23]

This amounts to what I believe Maslow was reaching for and would have expressed had he lived but a little longer. He said that he was pressing for and hoped to see data "arranged in a hierarchy of greater and lesser reliability, a hierarchy of knowledge that parallels an equally necessary idea of *stages or levels of development of science.*"[24] In some respects Assagioli, Jung, and Willis Harman with their views on "psychosynthesis" or synchronicity touch upon the same necessity.[25] Reiser calls it a developing of successive "isomorphic images in the emergent dimensions representing the role of operators in progressive steps from *vectors* → *versors* → *tensors* → *spinsors* to a higher source cosmic lensor which, through some cyclic feed-back, reaches down through fields of influence to supply the archetypal pattern for all rungs in the ladder of evolution".[26] Reiser, like Stulman, Bennis, von Bertalanffy, Fuller, and other comprehensive thinkers, pragmatically seeks a global view prior to seeking an interplanetary view. Reiser calls it a "world sensorium". Robert Rosen gives us our most significant clue for achieving a global or cosmic view in the hierarchy of complexity. He observes:[27]

> We may yet retrieve a possibility to account for hierarchical structures ... by attempting to introduce ... what is missing: more observables. An observable is a function on the state space; it is a computation. But automata and modular nets can do nothing if not compute; therefore, we can retrieve any particular observal be we may want to allowing an appropriate computing automaton access to the state set of our original system. In this fashion we may hope to regenerate, at least formally, the groundwork for a universal microdescription, the first prerequisite for hierarchical organization.

Maurice Duverger supplies us with the real meaning of how integration is achieved in complex organizations. He states:[28]

> Integration does not only depend on the structures of a society but also on the psychology of its members. Doubtless the latter partly reflects the former: but only partly. Education can foster integration in various ways.

First, it makes the citizens aware of the need to diminish the antagonisms which divide them, and of the importance of the material links which unite them. Secondly, it develops in them a sense of community.

The founder and pioneer of general systems theory, Ludwig von Bertalanffy sets the stage for the proposal of a Unibutz in these words:[29]

Perception is universally human, determined by man's psychological equipment. Conceptualization is culture-bound because it depends on symbolic systems we apply. These symbolic systems are largely determined by linguistic factors, the structure of the language applied.

My perception is that a Unibutz is within the reach of our world society and that it will provide a metamorphic force to achieve an active society observing its own evolution.* Amitai Etzioni places the challenge in perspective.[30]

The main questions for the transformation toward an active society are whether or not societies can mobilize themselves and their member collectivities to high, crisis like if not higher, levels in non-crises situations and whether or not they can generate power for internal, self-transformations instead of exerting their wills on other societies. Further, can this level and kind of mobilization be attained without generating so many countercurrents and so much alienation that consensual base of society and values related to it will be undermined as the realization of the values expressed in the goals advanced is inhanced? In short, is a "permanent revolution", a continual and authentic social-movement society, possible?

Having drawn upon the network matrix of comprehensive thinkers and designers; and in attempting to avoid that prescription of method common to the hypochondriacs, what healthy probabilistic plans can be made to achieve our deterministic goal—the Unibutz. Our time table of launch and settlement by 2000 provides a thirty-year base of action.

STEPS OF PREPARATION AND BASES OF OPERATIONS

It is quite essential that the U.N. become the focal point for Unibutz design, development, planning, and coordination. As a U.N. task assignment and long-range plan, and by involving all nations, Unibutz would enable the U.N. to become an entity with an international task

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* Polak, Fred. *The Image of The Future* (abridged edition to be published by Braziller in 1971) provides an overview of the envisioning capacity the world needs. Elise Boulding's "Futorology and The Imaging Capacity of The West", 1970, provides an excellent summation of Polak's views.

providing a pluralistic overview during the accomplishment of the task. The U.N. would serve as coordinator in the hierarchy of task effort and as the common nucleus for the network of national and individual groups involved in the task.

The subsystem breakdown, like the U.N., would be international rather than national in its formation.

The initial step recommended is for the U.N. to inventory the human and material (laboratories, institutes, etc.) resources and solicit proposals from such resources as to what contributions each such activity could offer.

KNOWN NON-NATIONAL ACTIVITIES OUTSIDE THE U.N. WHICH COULD CONTRIBUTE

1. The World Institute founded by Julius Stulman.
2. The World Resources Inventory and World Game under the leadership of Buckminster Fuller and John McHale.
3. National Institute of Applied Behavioral Science and the Tavistock Institute with their world-wide networks.
4. Foundations and International Corporations.
5. Council for the Study of Mankind, Inc and Psychosynthesis Center.
6. Universities. East-West Center of University of Hawaii.
7. Auroville (Auromodel: The Experimental Prototype of The Sri Aurobindo Society of Pondicherry, India) a unicultural community.
8. Committee on Cosmic Humanism and Academy of Parapsychology and Medicine.
9. Consortium on Peace Research and Esalen.
10. Committee for The Future and World Future Society.
11. Institute for The Future and RAND.

Julius Stulman captures the essence of his World Institute in these significant words: "We learn that continued synthesis changes all fixed systems into an interrelated field with ever-changing, pulsating boundaries, constantly feeding and adjusting to a greater whole."[31] Although Stulman's observations are global and practical rather than planetary—his recommendations are most worthy of earthly achievement and certainly essential in preparing for planetary colonization and society. In fact, by aiming for a higher integrative or planetary society, the lower level and high-synergy global society may become possible.

Stulman suggests that the "methodology will be offered in role-playing solutions on a multiple basis that nevertheless takes into account man's individual genius. We have to be able to develop (learn) whole; operating in a value system, better accomplished by learned knowledge applied to interpersonal relations in experience-based operations, not disciplined, fixed-relational (strictly learned) in order to understand the meaning of what is taking place."[32]

Tom Turner describes the World Game as the Dymaxion classroom (from dynamic and maximum) which he describes as "an environment for learning which allows the greatest amount of change to occur in itself and in the student."[33] Turner observes that it is "a heinous custom for self-styled critics of anything to follow their intuitions" without providing "credibility" or as he puts it the inability to deliver on promises—"a Michelangelo without ever doing a Sistine chapel or a David—a monstrous snobbery."[34] Even while Turner and Buckminster Fuller design the World Game for role playing in all win—no lose games of role-playing, they could expand it to the Planetary Unibutz game to be played and changed through experience over the next quarter century.

The World Grid could be expanded to a Planetary grid and other computer centers could assist in simulating a planetary community, thereby enabling the World Game to reach its ultimate potential—The planetary Unibutz.

The National Training Laboratories, the Tavistock Institute, and similar activities could expand their broad experience on community building to include a self-contained, international community traveling in space and colonizing a planet. A first step would be to design sessions which would enable people to overcome the rigidity of in-group specialization and out-group scorn such as over-specializing as Whites or Blacks; as Jews or Arabs, as young or old, as Protestants, Catholics, Muslims, Atheist or whatnot; as professionals, as male and female, and so on.

Martin Lakin and his colleagues, Lowrantz and Lieberman, have acquired some first hand experience with Arabs and Jews in Israel which could be put to good use. They conclude that "individuals are often virtually prisoners of their group membership, responding predictably and automatically to the fact of membership."[35]

Naphtali Golomb and Daniel Katz have gathered some significant observations on the Kibbutz system. They observe that, "The Kibbutz system furnishes a new model of community life which emphasizes both the integrated group and the integrated individual—a microcosmus (sic) society. It is a community which strives with considerable success to integrate technological achievements with social achieve-

ments."[36] In fact, they state that the Kibbutz is an open system with meaningful interdependence at three levels:

1. The individual level.
2. The system level.
3. Ths supra-system level.
4. I would add the global and cosmic levels.

Golomb and Katz suggests that "Since a large system cannot operate through direct democracy, it is important to know what forms of indirect democracy are most functional for effectiveness and member satisfaction. We would suggest that the relationship between the Kibbutzim and the Israeli nation furnishes a possible model."[37] Perhaps it offers a cogent model for our planetary society if expanded beyond its Zionist origin through including various nationals.* When the Kibbutz idea is expanded to an international base it would perhaps satisfy Reza Arasteh's plea for designing and developing fully integrated institutions in which fully integrated individuals could perform.[38]

Some national resources which have achieved a high level of international cooperation could offer meaningful contributions. I think of the United States Department of Agriculture, NASA, the Urban Centers, National Institutes of Health, NSF, etc.

COMPOSITION OF COLONIZERS

I urge that the Unibutz settlers be comprised of families to the extent possible, provided all required human resources are met. I am thinking here of children, parents, and even grandparent thrown in for good measure. Hopefully, pregnancies would occur enroute. I also strongly urge that, again considering all required human resources, families from different cultures, ethnic groups, and color schemes be included, along with a few select family pets. Too, I would have some agrarians along with the many urbanites.

WHAT SHOULD BE CONSIDERED IN THE DESIGN OF THE SPACESHIPS TRANSPORTING SETTLERS?

I believe the following should be considered integral and organic to the makeup of the Spaceships.

* Auroville, The intercultural community in Pondicherry, India, provides the best existing example of UNIBUTZ.

1. Separation of work quarters from family quarters.
   a. Work quarters for navigation, communication, waste recycling, propulsion, etc.
   b. Family quarters to consist:
      (1) Private living quarters.
      (2) Communal kitchen and food storage.
      (3) Nursery for young.
      (4) Commissary for distribution.
      (5) Chapel for private meditation or community worship.
      (6) Movie, TV, games and leisure rooms.
      (7) Library and writing room.
      (8) Group dynamics session room.
      (9) Community forum (chapel could be used).
      (10) Medical and dental clinic.
2. Greenhouse.
3. Design and modeling room—computer simulation of settlement during voyage phase.
4. Earth to space communication room.
5. Class rooms for educational needs for all ages.
6. Psychosynthesis Room for Psychic Communication.
7. Quarters for pets.

LIVING IN SPACE

Mitchell Sharpe and S.B. Sells have developed perhaps the best compilation of living in space based on current knowledge. Sharpe has provided us with a panorama from the past into the future—both U.S. and U.S.S.R. research and experience. He observes that "Today the first timid steps are history. We look now to the planets and beyond."[39] Micro-miniaturization, food-to-waste-to-food-to-waste recycling, cybernetic organisms, and human extensions will all have advanced significantly by the year 2000. That they do so with the human in humanity of utmost concern is our concern.

OBSERVATIONS AND CONCLUSIONS

The Unibutz, to me, is a goal and a challenge worthy of the dignity of man and his organizations and hopefully, in the words of Neil Armstrong and Kenneth Boulding, a giant step toward the unknown goal

of human history. In both Benne's and Boulding's terminology, it brings the actor into the act.

Boulding expresses it thusly:[40]

> It leads in the direction of a broad, eclectic, organic, yet humble epistemology looking for processes of organization rather than specific tests of validity and finding these processes in many areas of life and experience: in art, religion, and in the common experiences of daily life, as well as in science... It emphasizes communication and feedback as the great sources for orderly and organized growth; thus linking hands with both cybernetics and semantics. Most of all, perhaps, it brings the actor into the act; it looks beyond mechanism without falling into vitalism. It represents, I hope, one small step toward the unknown goal of human history.

For Kenneth Berrien, the Unibutz would provide a natural penetration of national, ethnic, sex, age, color, and linguistic boundaries.[41] For Roy Grinker and Irving Horowitz it would provide a unified theory while, at the same time, coupled with practice of human behavior.[42] Finally, for Warren Bennis it would afford the grand challenge for a task-centered, temporary society, unifying science and human relations into an organic-adaptive whole.[43]

In achieving technology without materialism, plenty without selfishness, community without tribalism, perhaps we may yet achieve a pantheistic-humanistic-cosmic awareness through, as Reiser terms it, "Avatars of Synthesis" with the Atman of being at their core. The Unibutz offers the grand opportunity for Maslow's peak experience at a planetary level. The war of the "external archetypes" could be ended on a peaceful note and man, at least, could internalize his spiritual archetype, and not feel compelled to force his external archetype on others.

The Unibutz is a global goal which honors the work of three outstanding behavioral pioneers who departed from us within the last decade—Douglas McGregor, Gordon Allport, and Abraham Maslow. As an idea, it does homage to the NTL founders of group dynamics and community building—Kurt Lewin, Ronald Lippitt, Kenneth Benne, and Leland Bradford. It expresses the principles of general systems theory advanced by von Bertalanffy, Rapoport, Gerard, Ashby, Boulding, Miller, and Geoffrey Vickers. It honors the humanistic dreams of scientists like Eddington, Heisenberg, Planck, Einstein, Oberth, Tsiolkovsky, and von Braun. It fulfills some of the dreams of futurists Jules Verne, H. G. Wells, Isaac Asimov and Arthur Clarke.

Symbolically, and perhaps highly feasible for the time frame, it would be ideal to launch three spaceships, each carrying 100 or more

passengers (symbolic of the voyage of Columbus and also the Mayflower) for the purpose of erecting a settlement on a distant planet.

At long last, we could say that we have reunited with a universe common to us all, and the cosmic chorus joins in a celestial song at this unification—the astral man of cosmic humanism surveying the universe.

Hopefully, I have followed the insightful wisdom of Mircea Eliarde. He maintains that "the symbol is capable of revealing a perspective in which diverse realities can be fitted together and even integrated into a system ... the examination of symbolic structures is not the work of reduction but of integration"[44] As Siu points out, our planetary age and society may well be called the "Age of Holistic Humanism", in which Mesthene believes we can institutionalize "the social expectation of change".[45] Hopefully, also the Unibutz proposal will create a moveable synthesis, a Tao of Eastern wisdom and Western knowledge, and a spiritual and mobile integration of man.[46] If I haveonly succeeded in challenging, I will be happy; for I believe, like John Platt, this is a seeding operation.[47] Once the blossoms are set, fruiting will follow. The Promethean and the Orphic, or the technical and artistic, side of man can unite and, in doing so, make him more human, and even enable him to create his elusive Garden of Eden.[48]

Unibutz is a "Human relationship, the social—a matter of action and passion, as well as motion and thought".[49] The sociodrama is being prepared and man, at long last, may be able to realize the beauty of interdependent life, not governed merely by survival but one which contains a morphogenic awareness of the emergent future.

Unibutz will help in shaping "New world structures toward which we are collectively moving so that they will begin to satisfy the deepest human needs and desires of all mankind instead ofdestroying us all".[50] *

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* The curious may want to read a recent article by Erich Jantsch which captures much of what I have attempted. Jantsch, "From Forecasting and Planning to Policy Sciences", Policy Sciences, **1**, No. 1, Spring 1970. See also Peccei, Aurelio. *The Chasm Ahead*, New York: MacMillan, 1969; Meier, Richard L. *Developmental Planning*, New York: McGraw-Hill, 1965; Waddington, C.H., (Ed.), *Towards a Theöretical Biology*, Chicago: Aldine Publishing Co., 1968; and Faber, Max. *Basic Issues of Philosophy*, New York, Harper and Row, 1968. Reiser, Oliver L. *The Integration of Human Knowledge*, Boston: Porter Sargent, 1958; Kropotkin, Petr. *Mutual Aid*, Boston: Porter Sargent, Paper Back, Extending Horizons Edition, 1970; and Williams, Robin M. Jr. "Individual and Group Values", in Gross, Bertram M., Editor. *Social Intelligence for America's Future*, Boston: Allyn and Bacon, 1969. Bennett, J.G. *The Dramatic Universe*, 4 volumes, London: Hodder and Stoughton, 1968. Youngblood, Gene. *Earth Nova*, unpublished, perhaps best sum up the aims of UNIBUTZ. Youngblood is Author of *Expanded Cinema*, New York: E.P. Dutton 1970.

REFERENCES

1. Tagore, Rabindranath, *The Religion of Man.* Boston: The Beacon Press.
2. Maslow, Abraham H. and Larry P. Gross, "Synergy in The Society and in The Individual", *Journal of Individual Psychology*, **20**, Nov. 1964.
3. Lee, Dorothy, *Freedom and Culture.* Englewood Cliffs: Prentice-Hall, 1959.
4. Bennett, John G., "TOTAL MAN: An Essay in The Systematics of Human Nature", *Systematics*, **1**, No. 4, March 1964.
5. *Ibid.*
6. Ben-Yosef, Avraham, *Ancient History: The 20th Century.* Boston: Porter-Sargent, 1970.
7. Reiser, Oliver L., "Project Prometheus and Krishna", *World Union*, April–May–June, 1970. Also see Reiser, *Cosmic Humanism.* Cambridge: Mass.: Schenkman Publishing Co., Inc., 1966.
8. Stulman, Julius, *Evolving Mankind's Future.* Philadelphia: Lippincott, 1967.
9. Gene Youngblood, "The Videosphere", unpublished, 1970.
10. McLuhan, Marshall, *Understanding Media: The Extension of Man.* New York: McGraw-Hill, 1964.
11. McHale, John, *The Future of The Future.* New York: Braziller, 1969. See also Modelski, George, "The Promise of Geocentric Politics", *World Politics*, July 1970.
12. Fuller, R. Buckminster, *Operating Manual for Spaceship Earth.* Carbondale, Illinois: Southern Illinois University Press, 1970. See also Dror, Yehezkel, "Prolegomena to Policy Sciences", *Policy Sciences*, *1*, No. 1, Spring, 1970.
13. Reiser, Oliver L., *Cosmic Humanism.* Cambridge, Massachusetts: Schenkman Publishing Co., 1966.
14. *Ibid.*
15. Ferkiss, Victor C., *Technological Man: The Myth and The Reality.* New York: Braziller, 1969. See also LaBarre, Weston, *The Human Animal.* Chicago: The University of Chicago Press, 1954.
16. Matson, Floyd, *The Broken Image: Man, Science and Society.* New York: Braziller, 1964. See also Krader, Lawrence, "Environmental Threat and Social Organization", *The Annals*, May 1970.
17. Clarke, Arthur C., *Profiles of The Future.* New York: Harper & Row, 1958.
18. Fuller, R. Buckminster, *Utopia or Oblivion: The Prospects for Humanity.* New York: Bantam Books, Inc., 1969.
19. Carey, James W. and John J. Quirk, "The Mythos of The Electronic Revolution", *The American Scholar*, Spring 1970.
20. Slater, Philip E., *The Pursuit of Loneliness.* Boston: Beacon Press, 1970.
21. Etzioni, Amitai, *The Active Society.* New York: The Free Press, 1968.
22. Allport, Gordon, *The Nature of Prejudice.* Cambridge, Mass.: Addison-Wesley, 1954. Rogers, Carl R., *On Becoming A Person.* Boston: Houghton-Mifflin, 1961.
23. Rokeach, Milton, *Beliefs, Attitudes and Values.* San Francisco: Jossey-Bass, 1969. Sanford, R. Nevitt, *Self and Society.* New York: Atherton Press, 1966.

24. Maslow, Abraham H., *The Psychology of Science.* New York- Harper & Row, 1966. See also Mercieca, Charles, "How Existentialism Enriches Educational Philosophy, *Indian Sociological Bulletin,* **IV**., No. 3, April 1967.
25. Assagioli, R., *Psychosynthesis: A Manual of Principles and Techniques.* New York: Hobbs, Dorman, 1965, and Harman, Willis W., "Old Wine in New Wineskins", in Bugental, James F. T., Editor, *Challenges of Humanistic Psychology.* New York: McGraw-Hill, 1967. Roberts, Morley, *Bio-Politics.* London: J. M. Dent and Sons, Ltd., 1938, and Caldwell, Lynton K., *Environment: Challenge to Modern Society.* New York: Natural History Press, 1970. A different slant is provided by Wescott. See Wescott, Roger W., *The Divine Animal: An Exploration of Human Potentiality.* New York: Funk and Wagwalls, 1969.
26. Reiser, *Cosmic Humanism.* See also Cofman, Victor, "Apostles of Integration", *Systematic,* **II**, May 1964, and Bunge, Mario, *The Myth if Simplicity.* Englewood Cliffs: Prentice-Hall, 1963. For an in-depth and abbreviated approach see Wilson, Albert, "Hierarchical Structures in The Cosmos", in Whyte, Wilson and Wilson, Editors, *Hierarchical Structures.* New York: American Elsevier, 1969. Also see Hubbard, Earl, *The Search Is On.* Los Angeles: Pace Publications, 1969.
27. Rosen, Robert, "Hierarchical Organization of Biological Systems", in Whyte, Wilson and Wilson, Editors, *Hierarchical Structures.* New York: American Elsevier, 1969.
28. Duverger, Maurice, *The Idea of Politics: The Uses of Power in Society.* Indianapolis, Indiana: Bobbs-Merrill Co., Inc., 1966.
29. von Bertalanffy, Ludwig, *General Systems Theory: Foundations, Development, Applications.* New York: Braziller, 1968.
30. Etzioni, Amitai, *The Active Society: A Theory of Societal and Political Processes.* New York: The Free Press, 1968. Also Vickers, Geoffrey, *Value Systems and Social Process.* New York: Basic Books, 1968.
31. Stulman, Julius, "Climbing to Mankind's Solutions", *Fields Within Fields ... Within Fields,* **1**, No. 3, 1968, The World Institute Publication.
32. *Ibid.*
33. Turner, Thomas Broussard, "The Dymaxion Classroom: The World Game", unpublished paper, 1970. Southern Illinois University.
34. *Ibid.*
35. Lakin, Martin et al., Arab and Jew in Israel: *A Case Study in a Human Relations Approach to Conflict.* NTL Institute for Applied Behavioral Science, 1969.
36. Golomb, Naphtali and Daniel Katz, *The Kipputzim As Open Social Systems.* Rupin Institute, Israel, 1969.
37. *Ibid.*
38. Arasteh, A. Reza, *Final Integration in The Adult Personality.* Leiden, The Netherlands: E. J. Brill, 1965.
39. Sharpe, Mitchell R., *Living in Space.* Garden City, New York: Doubleday, 1969. Dr. S. B. Sells is Director of the Institute of Behavioral Research at Texas Christian University. He has studied long-duration space flights from the standpoint of psychological factors. See Sells, "The Nature of Organizational Climate", in Tagiuri, Renato and

George Litwin, Editors, *Organizational Climate.* Cambridge, Mass.: Harvard University, 1968. Also Sells, "A Model for The Social System for The Multiman Extended Duration Space Mission", *Aerospace Medicine* **37**, No. 11, Nov. 1966. For a different slant see Ostrander, Sheila and Lynn Schroeder, *Psychic Discoveries Behind The Iron Curtain.* Englewood Cliffs: Prentice-Hall, 1970.

40. Boulding, Kenneth E., *The Image.* Ann Arbor: The University of Michigan Press, 1956. See also Benne, Kenneth D., *Education for Tragedy.* Lexington: University of Kentucky Press, 1967; Whorf, Benjamin Lee, *Language, Thought, and Reality.* Boston: MIT Press, 1964; and Burke, Kenneth, *Permanence and Change.* Indianapolis, Indiana: Bobbs-Merrill, 1965.
41. Berrien, F. Kenneth, *General and Social Systems.* New Brunswick, New Jersey: Rutgers University Press, 1968.
42. Grinker, Roy R., Sr., Editor, *Toward a Unified Theory of Human Behavior,* Second Edition. New York: Basic Books, 1967. Also see Gray, William et al., *General Systems Theory and Psychiatry.* Boston: Little, Brown and Co., 1969.
43. Bennis, Warren G., *Changing Organizations.* New York: McGraw-Hill, 1969; Bennis, Warren G. et al. (Eds.), *The Planning of Change.* New York: Holt, Rinehart & Winston, 1969; Bennis and Philip E. Slater, *The Temporary Society.* New York: Harper & Row, 1968; Bennis et al., *Interpersonal Dynamics.* Homewood, Illinois: Dorsey Press, 1964. Also Argyris, Chris, *Organization and Innovation.* Homewood, Illinois: Irwin-Dorsey, 1965. And Blake, Robert R. and Jane S. Mouton, *The Managerial Grid.* Houston, Texas: Gulf Publishing Co., 1964.
44. Quoted in Settler, Joseph, "The Role of The Spirit in Creating the Future Environment", in Ewald, William R., Jr., Editor, *Environment and Change.* Bloomington, Indiana: Indiana University Press, 1968.
45. Ewald, William R., Jr., Editor, *Environment and Change.* See also Boguslaw, Robert, *The New Utopians.* Englewood Cliffs: Prentice-Hall, 1965. Fienberg, Gerald, *The Prometheus Project.* Garden City, New York: Doubleday, 1969, and Kostelanetz, Richard, Editor, *Beyond Left and Right: Radical Thought for our Times.* New York: William Morrow and Co., 1968.
46. Nishida, Kitaro, *Intelligibility and The Philosophy of Nothingness.* Honolulu, Hawaii: East-West Press, 1966.
47. Platt, John R., *The Step to Man.* New York: John Wiley & Sons, 1966.
48. Mumford, Lewis, *The Transformation of Man.* New York: MacMillan, 1956. See also Helmer, Olaf, *Social Technology.* New York: Basic Books, 1966 and Michael, Donald, N., *The Unprepared Society.* New York: Basic Books, 1968.
49. Duncan, Hugh Dalziel, *Symbols and Social Theory.* New York: Oxford University Press, 1969. Also Sorokin, Pitrim A., *Contemporary Sociological Theories.* New York: Harper & Row, 1964; and Parsons, Talcott, *Essays in Sociological Theory.* New York: The Free Press, 1949.
50. Platt, John R., "Hierarchical Restructuring", Communication 269, Mental Health Research Institute, The University of Michigan, May 1970. See also Simon, Herbert A., *The Sciences of The Artificial.* Boston: MIT Press, 1969.

11

Beyond Crises: A "Creative Ladder" for Oncoming Generations

JULIUS STULMAN

THE WORLD INSTITUTE AND EXISTING STRUCTURES

I AM indebted to Sir Geoffrey Vickers of London whose kind, succinct and gracious letter in regard to the World Institute Methodology, asking for further clarification as to how it relates to international organizations which now exist, as well as for more detailed explanations of its operation, inspired the following.

I believe it would serve little purpose to relate comparatively to already existing organizations, as suggested. The World Health Organization, which came into being through the auspices of the United Nations, largely attempts to bring knowledge, draw standards of acceptance, make practical recommendations about medical research, mental and environmental health, and food, to participating nations. W.H.O. is not primarily a creative organization, not oriented to originate action programs on an innovative basis. It largely presents information, to its members which now exists or comes into being.

In working with the First Five Year Planning Commission in India in 1951, I experienced the limited effectiveness of information presentations. One of the suggestions I made was with regard to molasses, a by-product of their very large sugar cane production which was then mostly wasted. I suggested they develop a yeast bacteria culture under laboratory conditions, which would develop amino acids, on the molasses. The end product would be electronically dried and conditioned

to be blown, so that it adequately adheres to rice and wheat, thus becoming a supplement to their largely non-protein diet. (This application would be more easily accepted psychologically.) In addition, this would have a catalyzing effect on the other proteins which were inadequately being used in their diet.

Nothing came of it until I made a copy of my report available at the Pugwash Conference in Ethiopia in 1966. There the head of one of the committees put it forth as a new food supplement suggestion. Despite this reiteration, I know of no applications.

Just having information and making it available to countries which have no adequate entrepreneurship-ability to put ideas into practical application, is insufficient. What is required is the ability to put acceptable ideas into "systems-type operations", advantageous to the interests of all concerned. Such suggestions have been offered in *Fields Within Fields ... Within Fields*. In "Climbing to Mankind Solutions", **1**, No. 3[1]—there is a section dealing principally with "Medical-Health and Administration", which covers food, demography, and methods of science research applications with environmental concerns.

We should not be overly concerned with the inadequacies and failures of present systems. If we do, we will become unnecessarily bogged down in explaining and redefining structures that have evolved through the establishment of agencies which are only geared to improve present situations in an over-simplified manner, largely derived from accumulated errors and earlier inadequate positions. The proposals we offer are brought about by bringing into being new facilities, offering new capabilities whose self-generating operations could not exist without their establishment.

We can no longer resolve our problems and meet oncoming events by setting up another type of structure, another institution, more ineffective committees or bodies of organizations, which are based upon limited cooperation. It is only through the process of a "METHODOLOGY" capable of total and continuous involvement that we can hope to handle the oncoming problems in this fast changing world.

THE STRUCTURE OF THE WORLD INSTITUTE

The proposed World Institute Methodology has little relevance to usual information gathering, the manner of its use, distribution, application, or methods of communication. In fact, it is not in the nature of anything we have ever heretofore experienced. Nor can it be com-

pared to the use of former methods of problem solving which were largely inadequate for successful resolutions. It attempts to bring into being a *new resource*, with enhanced abilities, which could not readily come into being by other methods, and which has never been available. It is in the nature of a new type of "Brain", constantly operating on a creative basis—for the benefit of mankind everywhere—belonging to

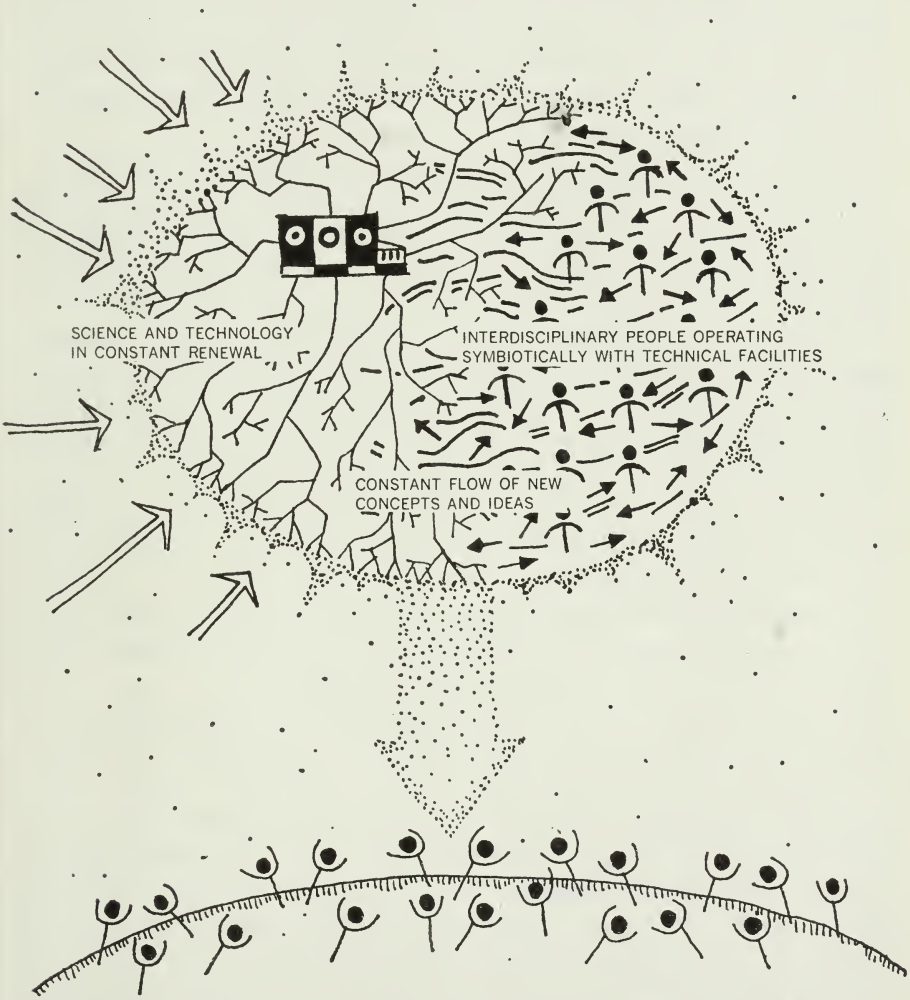

Figure 11:1 The World Institute exists in constant flow and change maximizing knowledge which is made freely available to people everywhere in the world and is offered in new key symbols in role-playing systems operation which aid people to further evolve and help man learn to live in change itself

no one but the flow of the peoples of the world, who help organize and continuously maintain it.

This Organism, THE WORLD INSTITUTE[2], an international body, would be composed of the very best men and women, brought to the fore, operating principally on a rotating basis, from anywhere in the world, from every discipline, who have been able to break out of their disciplines and work together in an organismically interdisciplinary manner symbiotically with the best of our growing technological abilities, at the peak of availability and performance in flow and change. It would be set up to funnel the latest information and creative abilities from everywhere around the world through affiliated institutions and established facilities.

This methodology should make available abilities far in excess of any which can accrue by presently known methods. It would enable man to discern *new natural laws* which cannot now be easily observed, and offer him the ability to judge the consequences of actions in the multiple effects "of quantum jump metamorphical changes".

The outpouring of continuous information is evaluated in-depth, broken down to its component parts in the movement of information flow, computerized, cross-referenced, and constantly interrelated and reevaluated. Such information, the maximization of mankind's knowledge, newly coded for effective use internationally, would be made available for continued review, research, or direct application in fully presented, well-integrated, "role-playing" programs at phased levels of conditioned acceptance.

Such programs, to be successfully effective, must be constantly reviewed, *because of multiple oncoming feedback changes.* They should, therefore, have continuing liaison-management-guidance, to make available oncoming knowledge and its implications, so that each program is capable of being continuously adjusted and enhanced by the latest findings.

With the abilities proposed, we move away from singular, oversimplified operations to systems, organization, synthesis—and crest into metamorphical changes which will feedback in "Systems Operations", changing relationships, all in the creative process. Mankind will be ushered forward into a new age, away from the concerns of singular, linear concepts—*TAKING TO HAVE*—towards an age of *CREATING NEW VALUES TO SHARE*, in a largely *NON-COMPETITIVE SYSTEM*, where values and service will be equally rewarding. This process will be capable of developing multiple values far greater than strictly singular materially oriented concepts could ever accomplish.

Man is basically the same system throughout the world. He cannot stand apart without doing violence to his true nature. There are yet abilities inherent in the *genetic potential* of the human being that cannot adequately come into play until he adheres to nature as a *whole man*, with inborn *integrity* capable of resonating a relationship with the makind species.

Solutions given must help resolve man's common basic urgent needs, aiding him to adjust to metamorphical changes which take place—as he shapes his environment, it in turn feeds back in constant change, values which encourage his continued emergence.

Systems cannot be engineered from parts to make constructs of creative values. What is required is a "holistic" approach with an integrity capable of moving through metamorphosis to hierarchical stages, continuously feeding back new values to all earlier parts, so that it may in turn feed forward for continued development.[3] Ethical considerations are inherent to this process. Limiting or manipulated constructs are incapable of responding to the system.

In the interplay of the system-man, inextricably involved in the mankind species and the Universe, moving continually through metamorphical stages, pulses an ever-adjusting organismic feedback. So that when a symbol, capable of recognition, communication, and application in a practical manner[4] is spun off, we have a "Eureka" moment.

Therefore, it should follow that, if with a growing wholeness and integrity, one approaches a problem properly defined and evaluated, in a broad integrative manner, the answer should inherently be evident at the peripheral point of one's conditioning to receive.[5]

THE POTENTIAL OF YOUTH

Dedicated youth (the great majority) searching with integrity, should be listened to, for in continued metamorphical evolution, the body-movement, civilization, oncoming youth, becomes alert to potentials inherent in the organismic feedback system. *Findings* emerge, becoming compellingly evident to youth's conditioning, give direction for mankind's continuum. The outgoing generations playing their responsible part in the total system. Their orientations, however, are not easily conditioned to read the impinging movements of the next generation, especially in epochal periods of rapid change, that we are now witnessing.

A comprehension of the feedback system movement indicates na-

tural laws to be observed, and reflects the MANKIND-GENIUS involved in the "METHODOLOGY" OF THE WORLD INSTITUTE.

In approaching problems today, it would be better to bridge over earlier structures rather than try to change or destroy them. In this light, creative new programs should gradually lose those "shadow" deterrents, which limited offerings made failure heretofore.

Creative ideas, to be successful, should be capable of bringing solutions to the point of acceptance and implementation in systems interplay, and should be so organized as to be both effective and practical. Indepth multiple action programs will be offered, so that they are recognizably acceptable to the *basic nature of man anywhere*, capable of guiding the individual to greater personal emergence, with self-respect, satisfaction, and the excitement of participating successfully in the creative process.

One need not have to spend his whole life accumulating limited dust-laden values born so largely from materially oriented conditioning, which emphasized things outside of himself. Man's recognition of his abilities, brought forth in dynamic cooperative role-playing and non-competitive interplay, should help him successfully resolve the problems which he now finds over-burdening.

At its upper level, it is concerned with the highest development of man, his growing comprehensive ability, and his spiritual emergence.[6]

At its lower level, it would have a better look-see at world movements, resources, abilities, opportunities, dangers and abuses. It would be in a better position to offer already accumulated knowledge and constant in-depth understandings whose implementation in creative germinal concepts would be capable of adjusting and recreating themselves, antiquating the old, and helping man learn to *live in change itself.*

Man should respond to the cooperative nature of this "new resource", become aware of the fast moving changes taking place in the world, and come to understand that the challenge is no longer egocentered, or so personally competitive. *(Youth's rightful cry!)*

No individual, nor any group of people in any number of lifetimes, could be equal to the flow of knowledge offered through this methodology. *Its abilities make everyone equally ignorant,* and call for a change of acceptance from that of outward accumulation, largely based on recall and relative cultural conditioning, to an *inner preparation and development to receive*, which encourages the emergence of "the whole man". True to his cooperative responsibilities and the very nature of his ethical emergence as related to mankind—hopefully developing a wisdom in the integrative activities of his total involvement.

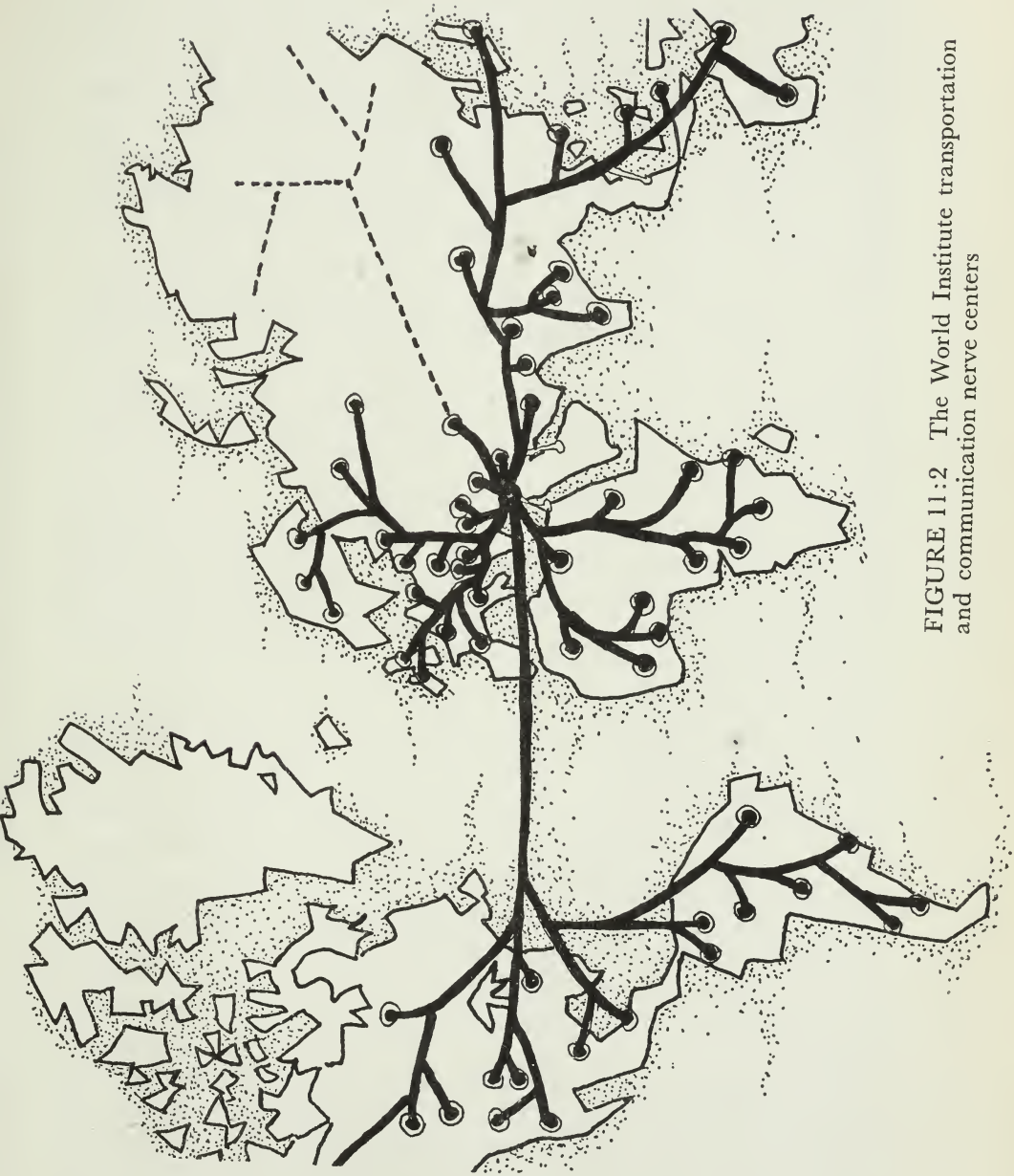

FIGURE 11:2 The World Institute transportation and communication nerve centers

THE THIRD INDUSTRIAL REVOLUTION

The feedback from the World Institute Methodology should eventually be more capable than any brain resource now in existence. It should speak to the opportunities and challenges of oncoming generations, overriding their concerns about Big Business, Big Labor, or Big Government.[7] The abilities and opportunities freely offered to oncoming youth should act as a challenging stimulant to corporations, which might otherwise reach limiting pyramidal positions. It should help guide labor's demands away from unproductive contributions to society.

I have no quarrel with Big Business, nor with increased participation by labor for its productive efforts. My criticism is of the limited, unimaginative orientation of Big Business towards corporate and stockholder concerns, without a broad recognition of its growing responsibilities, in the long run, to its own stockholders, the consumers who support it, and the total ecology of mankind with which it is inextricably involved, all this in its own best interest.

On the other hand, labor's demands that become solely concerned with how much they can get regardless of the consequences of their actions, rather than influencing the increased production of quantities of quality goods at lower prices, while encouraging the establishment of new distribution systems, in the long run are directly detrimental to themselves and to consumer concerns.

Big Business is comparatively small, relative to the opportunities and responsibilities to the growing untold numbers of potential consumers throughout the world.

The new Brain is capable of offering programs which can satisfactorily answer the Servan Schreiber cry of foreign invasion by more imaginative methods, which in the long run will prove even more profitable than current operations. It can help usher into being the *Third Industrial Revolution*, bringing in its wake a flood of quality consumer goods at unbelievably lower prices, to ever more consumers, than by the present less creative, traditional methods of production and distribution.

Such programs can be developed. Basic concepts along these lines are already being drafted which will be made available through the World Institute. This would strongly contrast the type of temporarily advantageous corporate moves, which obviously bring in their wake far more difficulties than can easily be observed by limited viewpoints which are much too relative to singular corporate adventures.

Business should be able to avoid crises as currently develop when one makes a contract seemingly equitable at the time of agreement, but which turns into inequity due to the fast changing information flow that accrues more rapidly to the sophisticated partner.

Restrictive controls and tariffs are largely unnecessary. They are products of our ignorance and lethargy—they bear the seeds of dissension and war. If, as the World Institute offers, we have the knowledge of the needs of the world's potential consumers and are willing to establish adequate new distribution systems—we will discover that the world has comparatively unlimited numbers of consumers. We need no longer use unimaginative methods, pouring large amounts of production capacity, *from whatever source*, into so-called easy selling markets, which only create unnecessary competition and tension.

THE NEED FOR A NEW MONETARY SUPPLEMENT

Information flow discloses there are consumer needs in almost insatiable amounts, when goods are properly designed, and adequately made available to meet the needs and customs of the world's requirements. It is largely because of our too singular and inadequate efforts that we have not recognized nor properly developed these consumers—nor have we concerned ourselves sufficiently with the need to create a new *International Monetary Supplement* to help bring all nations more readily into the flow of the world's monetary interchange. Such potentials are being developed by the World Institute.

In the developing countries it is not wise to offer singular products, made for sophisticated markets, *without helping to develop their total ecology*. Experience has shown that one cannot, or should not, sell a piece of sophisticated equipment to people who are illiterate, have little mechanical know-how, insufficient processing facilities or abilities, very limited marketing and distribution systems, and too often have entirely different psychological appreciations and values.

Our difficulties have been largely that the manufacturer of a given product has not been concerned with creating and developing the potential consumer in-depth. To do so, the corporation might have to take a revolutionary sense of *international responsibility*, become involved in helping to bring a developing country forward *through multiple product involvement*, as well as integrating through systems operation the efforts of many agencies as to the social and economic concerns of the people.[8] It has been loathe to do so up to now, because it principally

did not want to become involved, know how to handle the opportunities available, *or fully recognize the urgency of the world situation.*

Corporate executives are now challenged with failure, not only in regard to their stockholders, but in relation to their contribution to the maintenance of peace itself. In many cases, they are actually the culprits that seed the growth of tension, due to their inability to recognize the consequences of their actions, as well as inertia to further develop opportunities that can be offered in responsible systems—whatever the reasons. We should be aware that these very conditions were germane to the *sparking of Pearl Harbor.*

The United States, its success posture, has thrust upon it albeit a responsibility to behave as a great nation—a great people. Its influence abroad is deep and wide. Its successes reverberate in psychological sympathetic responses. Its failures generate a resentment—a spreading "chaos" to those who need us to stand strong alongside them. To continue to operate any longer with less than the best of our potential abilities, is irrational.

Our Government and our business leaders can no longer tolerate confused leadership, unimaginative approaches, ineffectiveness, inertia, egocentricities, selfishness, ignorance or greed. They must awaken to the responsibilities of enlightened statesmanship that the times call for—if they are unable to do so, they should be swept aside for more capable leadership.

An informed public will surely be able to speak to Government—become capable of placing in office responsible legislators, grown professional, and more equal to the challenge, through the guidance and understanding of new world-wide values offered through the World Institute. They should thus be better equipped to preserve the liberties of independent people in a free enterprise system, more capable of helping to resolve not only domestic problems, but the pressing foreign concerns of mankind, without necessarily using force.

They should be better able to give foreign aid without disturbing the balance of payments, but through integrated, creative programs of knowledgeable, cooperative assistance, brought about with mankind concerns, rather than through the lethargy of traditional, over-simplified, ineffective, problem-solving methods of gifts, grants, or writing a check. Neither can the problem be eliminated by appropriations for "research studies" which few read, and which are seldom properly evaluated, too often assigned to "committee responsibility", with reliance upon confused leadership. (Who was it that was supposed to do the homework?) Then they are hurriedly brought out of committee in

hastily proposed programs, much too often with the confusion of Bay of Pigs decisions.

We—all of us—under present inadequate methods of knowledge-flow, live far too dangerously to permit any leader to put his life on the line for us.

THE ABILITY TO LIVE IN CHANGE

What is now required is that man should come to understand that it is *he* who has to change, in order to effectively take advantage of the largesse which is offered in his own best interests. To do so, he will have to learn how to grow more whole, to meet the challenge and acquire the *ability to live in change itself.* He will discover that what is needed is not following the traditional learning accumulation, or textbook abilities heretofore offered, step by stage, but rather the development of a "wholeness" which is *within his ability* to accomplish.

Furthermore, he must recognize that it is within the orderly nature of every human being anywhere in the world to so emerge—for each possesses the same ultimate potential. Man and nations must learn to develop and grow, moving away from compelling insecurities, which impose limitations of freedom.

In *systems interplay involvement*, he should develop enhanced abilities that he could not readily accomplish by any other now known methods. As this new Organism evolves, created by man to serve mankind, belonging to all mankind, it should be discerned that things are not what we thought them to be—that man biologically-psychologically can no longer believe himself as *standing outside* of the system of the movement of all things, for he is inextricably part of the mankind species, totally involved in an orderly Universe.

I believe the common denominator of all things rests in field pattern discernment. Man will have to learn to move from his so-called "materially oriented axis", to the adoption of an attitude which falls more nearly under the heading of the "methodology of pattern in field theory concepts", the indepth meaning of which he has yet to understand.

In the establishment of the Brain complex, as outlined, I believe we will evolve a new "gestalt-type" of catalyzation which should increase the creative potentials, even of those most select men and women, with the highest qualifications, who working together at a *heightened interplay*, supported by the best of technology, will acquire enhanced abilities, sparked to a greater degree than ever they could be heretofore. This

would create a new *dimension for mankind*, far beyond the rare cries of yesterday's truly creative moments.

The constant flow of maximized knowledge gives people everywhere an ever-adjusting source of feedback values made available to their conditioning to receive, and their willingness to operate with it. The compulsive, biological-psychological impulse of man, in his normal reactions to the security of balanced cultural relationships, will be influenced by a new *LEADERSHIP* derived from concerns with the human species—a *WORLD CULTURAL FEEDBACK IN CONSTANT CHANGE*, with a new perspective in regard to earlier limiting factors, of geographic, ethnic, or nationalistic influences.

We should not be concerned about a common culture, for constant change does not allow for crystallization as has developed in the slow-moving cultural feedbacks of the past. Furthermore, each person is cybernetically quite individual, and future development will be more personal and inner, than cumulative and outer.

A CREATIVE LADDER FOR YOUTH

Through the "World Institute Methodology" a *CREATIVE LADDER* has been devised which makes it possible for youth, the oncoming people throughout the world, and especially for the so-called developing nations, to have available to them the maximization of mankind's knowledge. Among the multiple advantages offered is the establishment of much needed world-wide distribution systems—a flow of science-interchange especially brought to bear on raw materials. The flow of the world's technological abilities and goods in an acceptable manner can help resolve their current urgent problems. Far beyond that, however, is the establishment of a system to help bring forward the growing creative abilities of mankind everywhere, which might otherwise be lost to the peoples of the world. The brain-drain would be reversed and the ever-widening gap caused by unequal distribution of opportunities would be closed so that man could climb together with all mankind, with self-respect, in freedom as equal partners, into the Twenty-First Century.

Any resolution offered by the World Institute Methodology will have to be communicated to the system man everywhere the same, at the same time, on the same level, and in a manner that he can accept. Surely not oriented to "book-binding, eye-to-page" traditional academic institutional influences. We should, therefore, observe in the

feedback system of emergence to hierarchical stages of growing whole, that each of us has a compulsion to teach—to feedback, to the mankind species within which we are involved, so that we, in turn, are fed, enabling us to go forward. *Education should be recognized as a lifelong process, interwoven in everything a man does.*

Untold numbers of creative possibilities can be offered by the methods we outline. There are earmarks of unbelievable solutions which could be given to England, for example, to help her move forward to greater heights of contributions to civilization, than were ever thought possible, in contrast to the depressive and debilitating bickering now taking place. The loss is not only to the people of England, but the greater loss is to the people of the world, who need the outpourings of so highly a developed culture.

Indeed, there are some very exciting solutions even now on the drawing boards, which hold great promise to help resolve some of the intractable problems that currently plague man, in the world's most troubled areas. These integrative solutions, as they are brought to bear on the total ecology of mankind, could not readily come into existence without the new creative facilities which we are advancing.

The difficulty is to obtain an acceptance of the in-depth multiple values that are offered, as the way in which the problems can ultimately be resolved.

If the WORLD INSTITUTE, established by mankind, belonging to mankind, was now fully operative, I believe people everywhere would be willing to listen and accept such proposals as might be forthcoming from this impartial, non-coercive body, offering mankind's knowledge to all on an equal and practical basis.

For instance, there are solutions to the Middle East difficulties which could create immense values, both for the emergence of individuals and their material welfare, that could develop because of their *creative nature*, beyond the *success patterns* of Japan or West Germany. These indeed, could bring forth far more values in the proper cooperative interplay *of the people now in the Middle East*, as their potentials develop, than they could hardly believe possible. This with a full appreciation for the needs, personal growth, and self-respect of the developing people in the areas, which are now endangered or lost to intrigue, greed and ignorance—churned by too many "well" wishers.

AN EXAMPLE OF THE WORLD INSTITUTE IN OPERATION

It is nigh impossible to give an illustration of the type of solutions that could be pouring forth from the onrushing currents of the methodology of the World Institute. Its organismic involvement in integrated cross-catalytic effects is brought about by rapidly advancing technologies, guided by the heightened abilities of those who are creatively involved in its total interplay, with in-depth understanding of man in the mankind species in the flow of civilization. When the method concerns itself specifically in problem-involvement with particular people, at a particular time, it has the ability to take into account multiple, integrated growth changes as they relate to maximized knowledge in a continuous feedback, brought to bear upon the problem. It is difficult to even imagine the unbelievable changes for good which could come over mankind evolving through this creative process.

It should be recognized, therefore, that any example which is given is not only already antedated, but limited to the *now*. However, in an effort to make some reasonable communication, I have no alternative but to deal with the relatively static structure of today's limiting values, hoping to give at least an indication of the direction our efforts might take.

The method implies that a so-called sophisticated individual in an urban area, can play his relative role, on an equal and equitable basis relationally, with that of a so-called illiterate man, let us say in Africa. When they are both involved cooperatively in a role-playing participation in the same system, with the same value base, they are both equally fed and guided with knowledge and abilities, far beyond that which either can accomplish, acquire, or maintain, without the sophisticated interplay of the World Institute's activities.

For example, a so-called illiterate man, currently gathering bushels of a mixed variety of freely grown, uncultivated nuts, receives traditionally a few pennies a pound for his efforts selling through historic channels. He is given a standard container and told to fill it to the brim with a specific type, size, and quality of nut. Instead of just pennies for his labor, he would receive an amount on account, equivalent to dollars, when the container is brought to a modern, electronically controlled, containerized, distribution warehouse, which comes alive through a commodity exchange, with multiple interrelated computer facilities and contacts throughout the world.

This container now becomes part of the "systems operation" which

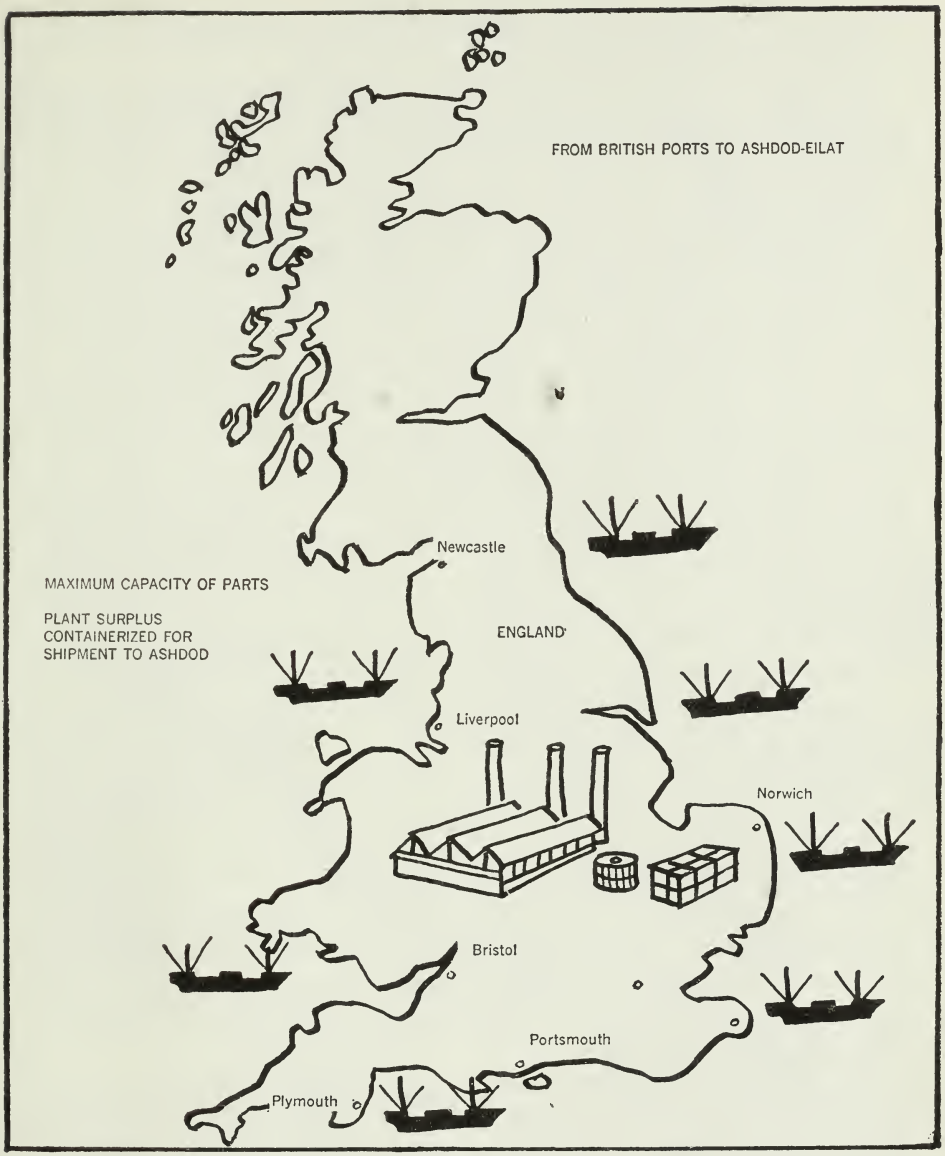

FIGURE 11:3

has sold his nut on a cooperative basis, after due processing, as chocolate-covered candy, deluxe packaged, to such select selling outlets throughout the world as, say, Fortnum & Mason. All those involved receive predetermined computerized participation in the ultimate selling price. The service agencies receive a fee for guidance, handling and

integration of all services, including procuring "back-to-back" orders, to insure a successful operation.

Of course, the nut gatherer need not fully understand what is taking place, even though the advance he receives may amount to approximately two-thirds of the commodity exchange's evaluation of his ultimate participation.

When the computations, to which he has consented, are finally made, he will additionally receive a ten year Government interest bearing bond, for the approximate balance of one-third due him, less taxes and other prearranged costs, as a loan, given by him to help build the very necessary savings accumulations for himself, and for his nation.

The Government uses these funds for modern school facilities, film libraries, hospitals, roads, transportation facilities, the making of further product refinements through science application, and otherwise aids in the development of a growing industrial complex, moving out from the axis of the sophisticated containerization warehouse distribution depot. It also helps establish "cooperative community stores" which will offer "real" dollar values, through low-priced products, cooperatively produced or assembled from local and/or imported parts, developed together with the researched guidance of the Brain.

In such countries where the traditional money lender has enforceable priorities tending to discourage increased productivity, it may be that by Government regulations such loans become prior liens against the ten year bonds. Where this may not be fully effective, non-negotiable, non-cumulative scrip could be issued as part of the initial advance, to be redeemable at the community store, for personal use only. The recipient of the Government bonds should also have an ability, under predetermined conditions such as health, housing, education, travel, cultivating his own raw materials, developing his own processing plants, or for other extraordinary needs, to redeem percentages of the bonds before their expiration date.

The fact that the Brain worked out the cooperative arrangement as part of the system, with Ghana for cocoa, and Israel for chocolate, packaging and sales, is initially unnecessary information to the nut gatherer. However, in effect, he has been benefiting from the ultimate knowledge and skills of the latest technology, distribution system, and the best worldwide sales obtainable.

It is hoped that through this method the nut gatherer, his family and the community will move forward. His additional levels of participation in a growing complex of multiple efforts will bring to bear new processes and science to many products and reverse the present trend of

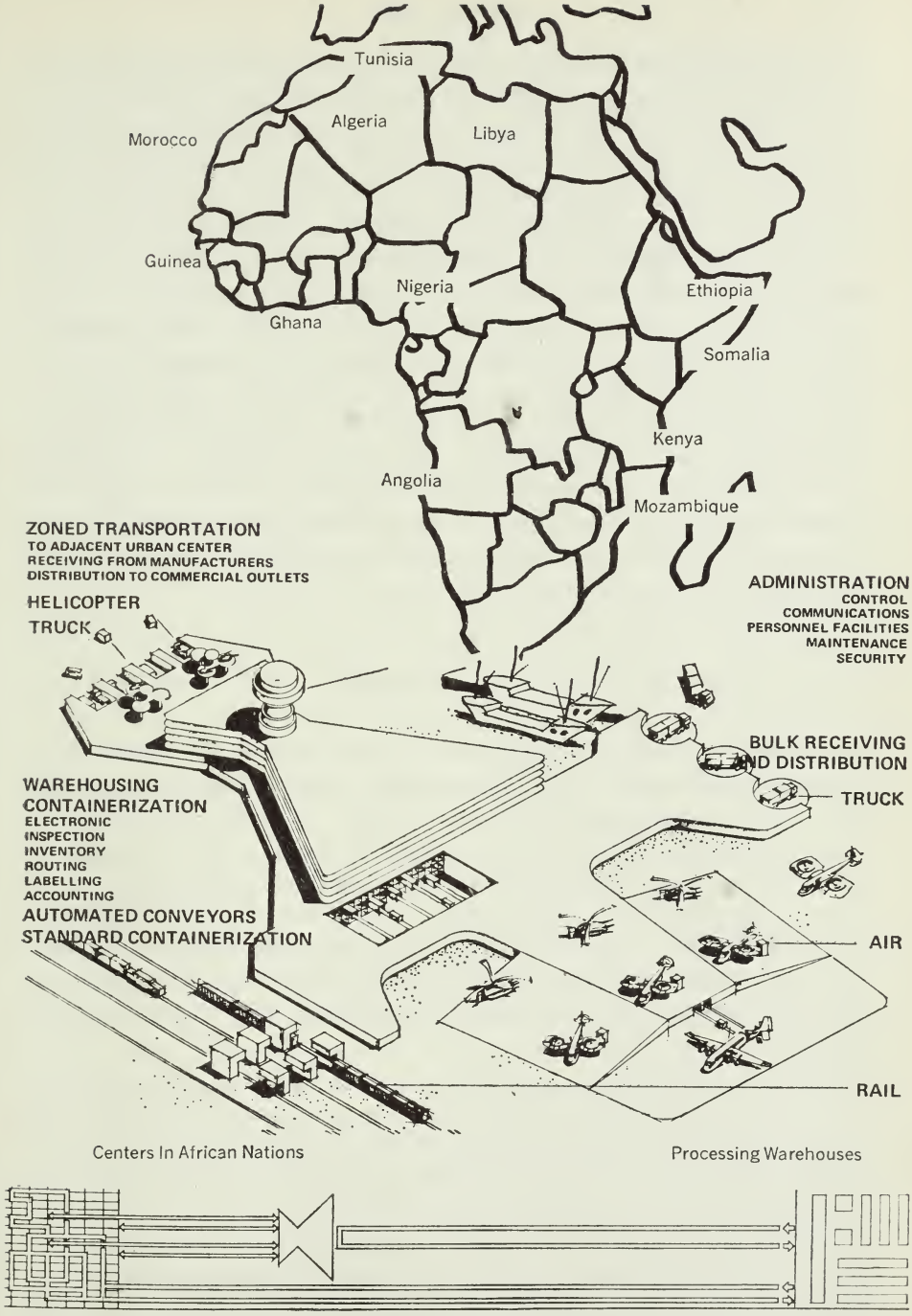

FIGURE 11:4 Distribution satellite

limited raw material uses. He will have an opportunity *in the doing*, of becoming educated in all phases of domestic and international operations, and gradually could become an effective individual, no longer subject to the exploitation that was so largely due to his own ignorance, as well as the lack of opportunities which could have been available to him and were some of the factors that kept him illiterate and wanting.

The highly sophisticated system of strategically situated distribution complex depots, acting as world-wide inter-connected nerve centers, concentrating rapid transportation facilities, together with multiple services, resources, raw materials, processing plants, research applications, managerial guidance, insurance, establishing secondary financing methods,[9] developing integrated "school-factories, turn-key plants", coordinating home craft industry efforts, producing parts to quality controlled specifications for assembly and sale for both domestic and export markets, all hooked up with the world-wide commodity exchange and the Brain, helps insure the acceptability, desirability, and success of this ever-developing operation.

AID TO DEVELOPING NATIONS

It should have special impact for the peoples of developing nations, providing easy access to a growing complex, which moves continuously into multiple integrated activities, helping to aid the conversion of raw materials through science applications and consumer research to desirable new end products. It should help bring the technologies of the world, both knowledge and product, into rapid interchange, through the same system. The developing countries could more rapidly advance, offering the increased products of their efforts on the *Highways of the World*, on a *WORLD REFERENCE FRAME OF VALUE BASIS.*

Each country should contribute only that which it can do best, at the lowest possible price, towards creating an ultimate end product. In the feedback interaction there should also be an attempt to integrate resolutions to the multiple problems that are indigenous to each country.

For instance, Ghana's contribution of cocoa to the end product—chocolate bar.[10] Ghana, now a one crop nation, depending largely upon cocoa sales—could have a crop failure, or a depressive surplus, which could seriously affect the welfare of the people, the economy of the country, and challenge its political stability.

Under such difficult conditions heretofore, large sums for aid have been obtained which act adversely on the donor's balance of payments, or loans have been obtained whose accumulating interest and payments become difficult to handle.

Through the ability of the Brain, bringing to bear the world's knowledge upon the problem, it is possible to ascertain the total production of cocoa, reasonably anticipate future crops, determine potential consumption. Through research develop methods to increase consumer use, find additional markets, institute new processing procedures, and develop new end products. A continuous study of the *molecular structure* of the cocoa bean to determine what additional uses could be made of it, alone or in combination with any other product, products or processes, which are, or become available, should be made. Special consideration should be given to the concerns of problem products of cooperating nations, all towards producing new end products, either as additional food, additives, or for industrial uses.

The Brain would likewise research the rich soil which produces the cocoa bean, to determine what other products could best be grown that can produce equally or more desirable products which their surveys find available and meet consumer needs.

In order to avoid a depressive cycle when a surplus crop is evident and sufficient solutions have not already been worked out, stable end products could be produced, containerized and bonded, so that they could become bankable. These then, could be widely distributed and warehoused for gradual absorption throughout the consuming world. Advances could be handled by the computerized abilities of the commodity exchange, operating in Jerusalem, for specific percentage amounts, against each container necessary to meet the minimum requirements for Ghana's stability. Initial advances obtained from private banking sources, additional advances, as required, from the World Bank, other financial agencies, corporations or individuals interested in its integrative operations, such as steamships, railroads, airlines, trucking firms, processing plants, container manufacturers, or from other nations, all as loans, at interest, *properly secured*, priority percentage rated against the same bonded container, to protect each lender. Thus, hopefully, the level of advances needed for Ghana, is made available.

The advances made against each bonded, registered, insured controlled container are then liquidated, after paying interest, storage and service charges, and paid back in an orderly fashion to each lender pro-rated, per agreement, under the responsibility of the commodity exchange.

If, after a predetermined period, there should be a remainder surplus left in storage, the coordinated efforts of multiple agencies, interested in making food distributions where needed or for institutional stock-piling, could give priority concern to purchase the remaining containers, for the loan advances. It would be unlikely, under these circumstances, for there to be a meaningful deficit in the final liquidation, but if this did occur, it should prove to be a manageable amount for Ghana to handle herself, as she now has a new "secondary financial ability", enabling her to borrow against any containerized, warehoused inventory she may have.

In all events, it is hoped that the coordinated research efforts of the Brain will gradually reduce or entirely eliminate these pressure points.

Many nations will be dealing in multiple integrative efforts, either supplying raw materials, interim processing, and packaging, distributing and selling finished products. Should any of them, for any reason, let us say Ghana, wish to produce the total end product, assume all the processing and services, believing that she is capable of producing the quantity and quality acceptable to the market, her cooperating partner, in this instance Israel, would be willing to assist her to accomplish the total operation. Israel's participation was in the use of her abilities in the processing, packaging and sales, producing a quantity product acceptable to the consumer, at what was considered the very lowest possible price, for an agreed service percentage. She would not consider this as a loss, as would be normally considered in a strictly competitive, non-cooperative effort, but would actually *endorse* this move, recognizing it as an advantageous advance. Directly and indirectly Israel's total growing efforts, abilities, and services would still be used to the full for other and additional products.

Since Israel is moving towards a KNOWLEDGE ECONOMY, and in all events would be working on a service fee basis, by helping to increase the total Ghanian economy, she would benefit by the increased buying power generated in her continuing cooperative efforts with the growing Ghanian economy. This assuming, of course, that Ghana could produce the end product successfully and was not interested in handling the total operation for limiting reasons of false pride.

Each of the developing nations should move towards accomplishing the *maximum of their growing abilities*, helping each other develop from phase to phase, through multiple product and service exchanges, and the cooperative employment and very best use of their developing talents. *No efforts should be inhibited* that help an economy freely develop,

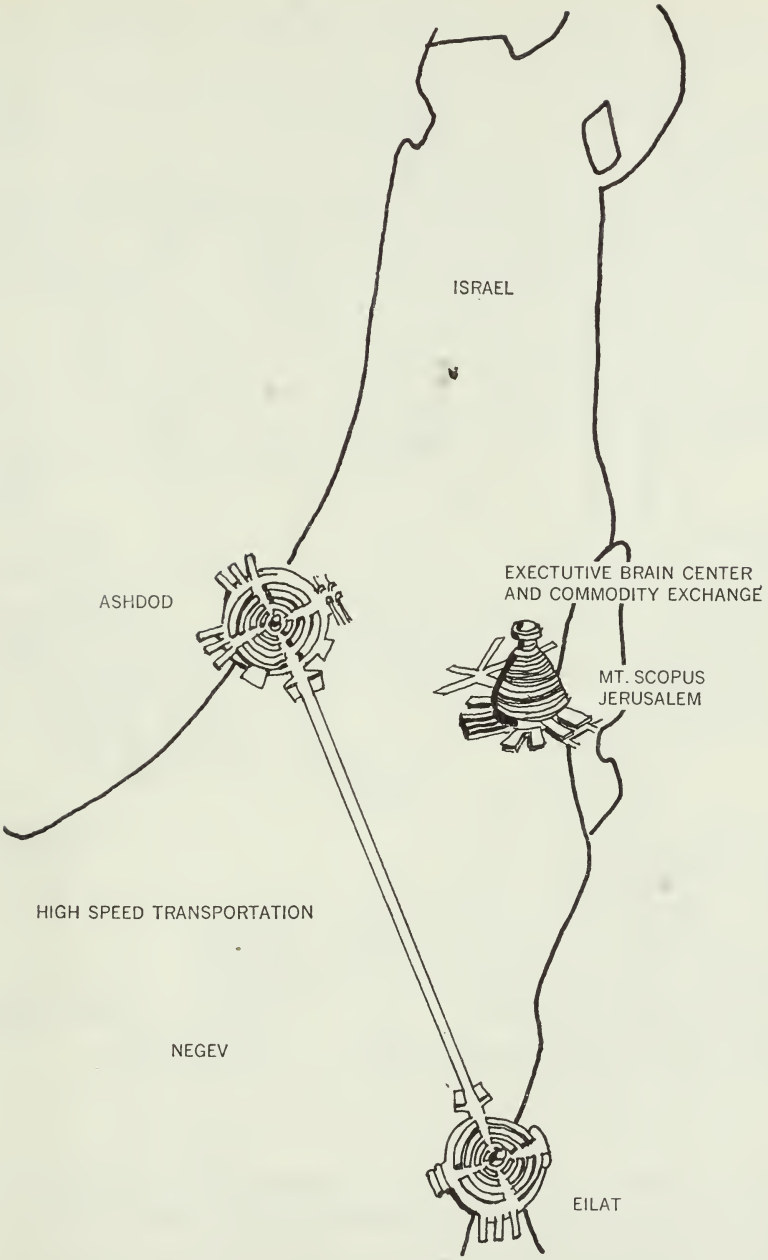

FIGURE 11:5 Processing and distribution centers

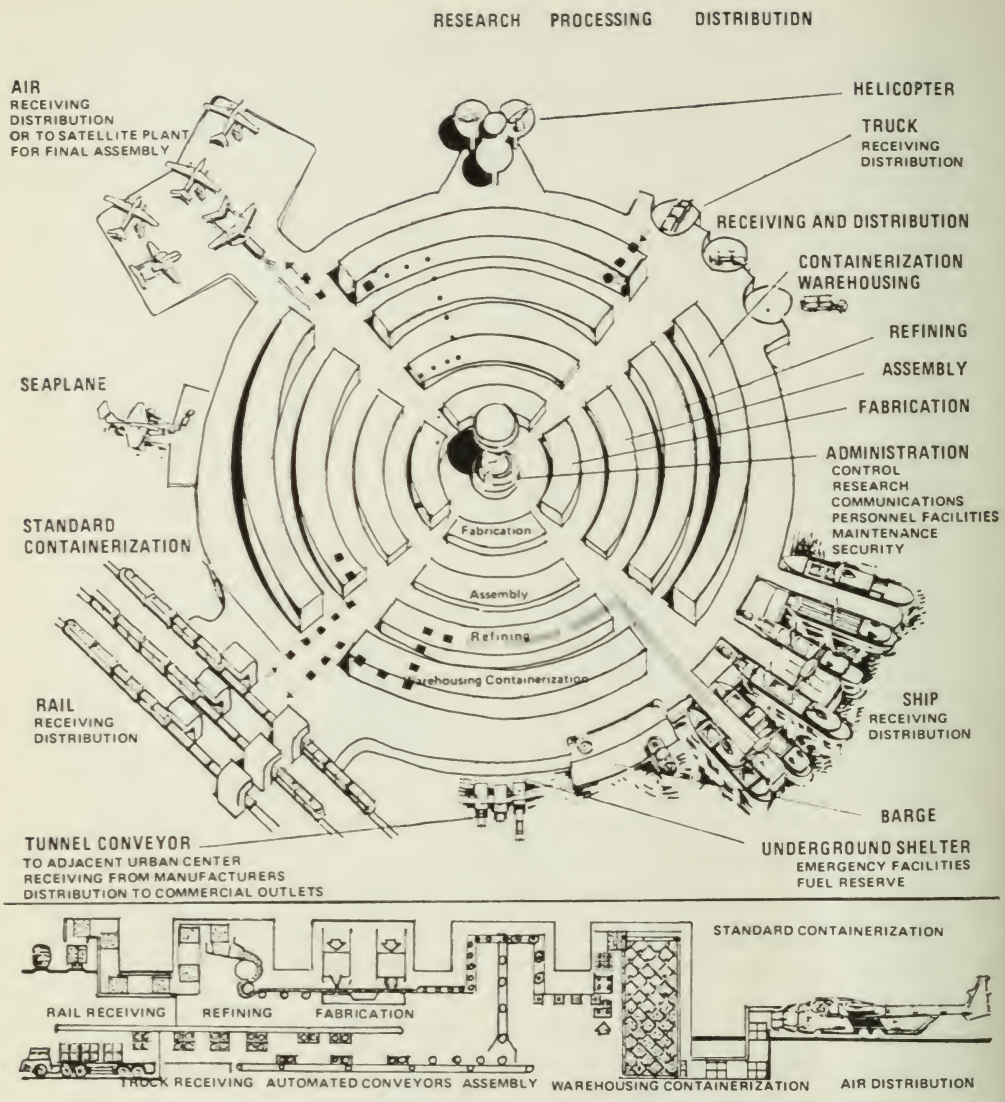

FIGURE 11:6 Transportation axis (detail)

so that it may increase its contributions to maximum productive abilities, help maintain a stable political structure, and develop an increased buying power.

As confidence in the cooperating countries grows through the successful guidance of the Brain's efforts, they should become less concerned with the need for unrealistic, nationalistic controls of unprofitable operations. Each should accept the opportunities offered, adequate to

their growing stages of ability, and in the total, should be brought to the point where, in the multiple applications of many efforts, their gross national product is continuously increasing. Pulse-feeding an ever growing volume, as they continuously evolve.

The cooperating nations should find themselves quite busy in their multiple involvements. They would indeed be working in their total efforts as a *MULTI-NATION*. With maximized results they would produce both in quantity and quality, products that would be extremely difficult or nigh impossible for any one of them to accomplish alone, thus receiving integrated, multiple returns out of their cooperation. An immense volume of products would be created which never existed before, and potential consumer demands would be brought into being which were equally lost. *Their combined efforts makes them equal and capable to that of a so-called developed nation.*

A NEW LEADERSHIP FACTOR

The World Institute Methodology thus brings into play a NEW LEADERSHIP FACTOR for mankind, in the very interaction of its multiple role-playing activities. It encourages the evolution of new types of organizational social structures, best suited to the increase of individual freedom.

Its Methodology helps to orient man, advance naturally through the adventures of growing whole, becoming better prepared to receive catalyzations to his growing abilities, moving away from a material axis towards spiritual freedom and development. *A comprehension, now better conditioned to the next stage of his evolution—the ability to read the Universe.*

We should be concerned with the restive rumblings, gestating unrestrained, in the womb of mankind. Problems fermenting pressure to revolution attempt to abort the direction fathered by civilization. These signs should not be read with alarm, but rather should signal hope. A fusion of mankind's accomplishments—*the creation of recognizable order out of seeming chaos.*

We should discern in Nature's order new Mankind laws, enabling us to equate balance and harmony. Evolve a new Leadership Factor compellingly acceptable to all men, giving birth to a Mankind-Genius that they may continue their creative emergence toward wholeness.

The people whose talent developed the growing sophisticated technologies should move quickly to its signalling changes, and unburden their scaffolding.

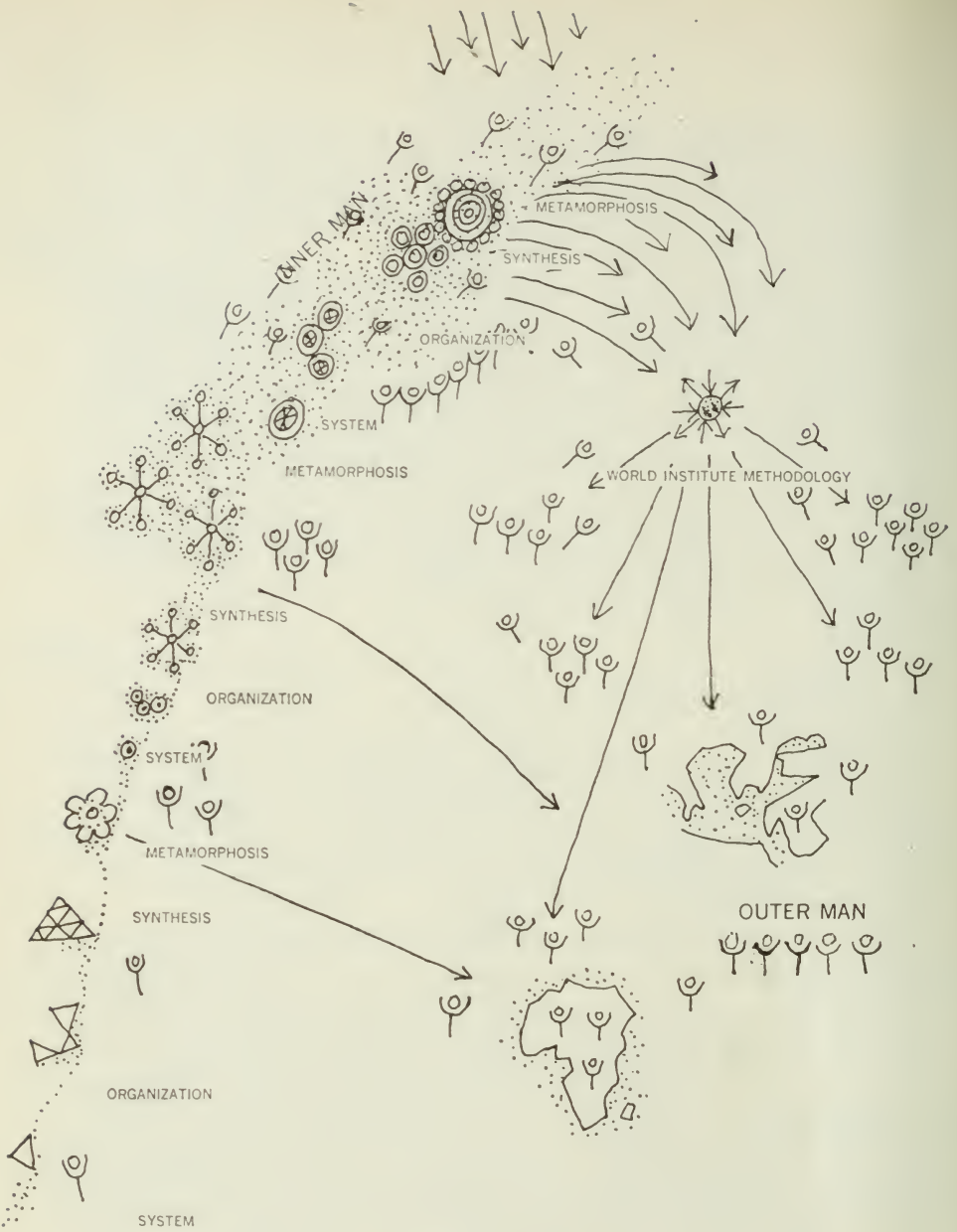

FIGURE 11:7 Man has to learn to move from the orientation of Outer Man in a largely "Thing System" to personal inner development and a value sense, recognizing his involvement in the mankind body and the universe, "learning how to live in change itself", becoming part of its system. The heretofore slow-moving "Eureka" moments spinning off from the creative process now moves in constant change itself as the methodology of the World Institute comes into play

The growing anxious people of the world should recognize that a new Methodology has been evolved—a Common Vehicle equal to the challenge, capable of bringing all mankind forward together at the same pace. *The revolution mankind truly faces is not that of outer man concerns, but that he move over to developing inner man—mankind concerns,* that he become capable of creating new values to share with all mankind. He should grasp, if need be with an intuitive discernment, that this LEADERSHIP FACTOR is capable of resolving his problems, able to guide civilization forward with greater abilities than was ever manifest by the coercion of the cross-bow, or the negative implications of hydrogen abilities.

If we could indicate goals—meaning in life—it would be found more in the direction of a "methodology" wherein the true nature of man can better emerge in hierarchical stages interrelating with the mankind species involved with all of nature, catalyzed by a growing mankind genius. Moving through continued metamorphical development to heightened abilities now capable of receiving further catalyzations in the interplay with the intelligence of the Universe—sparking at the peripheral point of man's highest development, a fusion to wisdom in continued evolution.

NOTES

1. See especially pages 91 through 106.
2. The World Institute—J. Stulman—1941.
3. *Energy Theory with Regard to Human Relations*—J. Stulman—1944.
4. "To be practical is the ability to deal with error." J. Stulman—1939.
5. "He who is prepared receives to the exact degree of his preparation." Stulman—1939.
6. *A Pattern for Life.* J. Stulman, 1951.
7. *Toward a Better Society.* J. Stulman, 1950.
8. See detailed example which follows.
9. *World Economic Development,* J. Stulman, Public Affairs Press, Washington, D.C., 1961.
10. The nut-cocoa-candy example as used here, could be any other raw material—processing procedure—or end product.

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