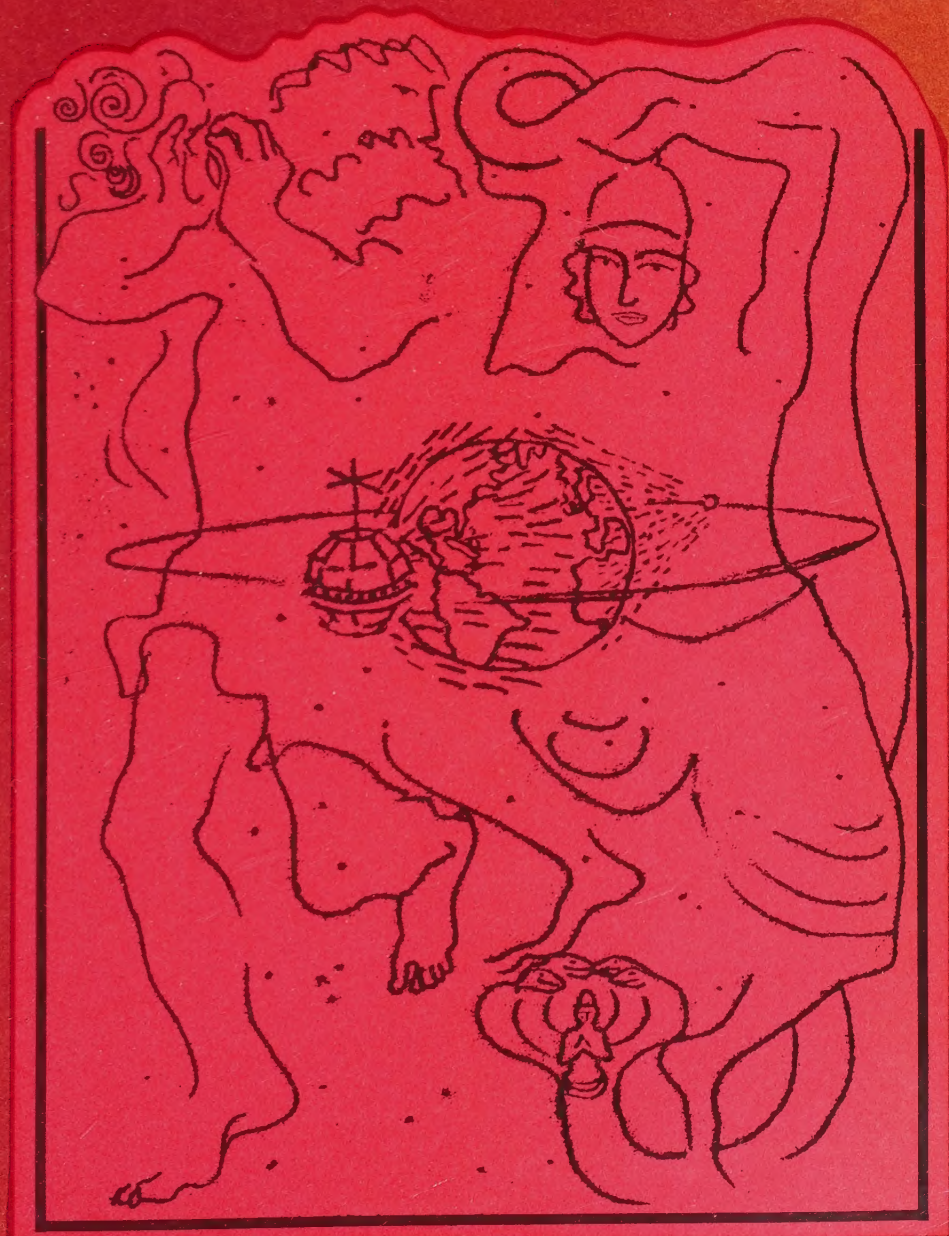
Cosmic Humanism and World Unity

Oliver L. Reiser



AN INTERFACE BOOK

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INTRODUCTION

THOUGHTFUL individuals are agreed that mankind is in the midst of a revolution in ideas, social attitudes, and even in cosmic relationships. For some, this dissolution of the old culture is the prelude to the creation of a new era, a coming world civilization. There are many new proposals and plans. The present system of thought—termed a "cosmic humanism"—is a complete world-view, a theory of knowledge, a cosmology, and a possible universal religion. It aims to discover and formulate some of the main principles that may help mankind integrate the world ethically, aesthetically, and spiritually, as science and technology have integrated the planet in its physical relationships.

The results of the present search for synthesis are frequently difficult to translate into ordinary language, especially when it has become necessary to coin new terms for novel concepts. This procedure is explained, and I hope justified, in Chapter 2, where the program of a "creative semantics" is set forth as an integral part of the emerging Cosmic Humanism.

As the reader moves into the later chapters, he will begin to sense a measure of repetition. This comes about because certain themes are foci around which the entire system has crystallized. In the presentation of the total pattern these nuclear centers serve as guide posts that help in the processes of orientation. My hope is, of course, that there is some sense of progress as the story unfolds.

The reader will observe that much of the effort of the later chapters is devoted to the heroic effort at trying to "rebuild" Solomon's *Temple of Wisdom.* Here the architectonics is put within the context of a global habitat—even a cosmic frame of reference. If one asks for an exemplification of what the "temple" should be like and how it should function, the reply is that the WORLD INSTITUTE COUNCIL in New York is surely one of the present best "models" for such a world cultural center. Here the cybernetic integration of knowledge and social programs should proceed apace.

This is one illustration of the "Fields Within Fields Within Fields" that Julius Stulman proclaims. Many other such feed-backs will emerge as time passes . . . but that is for the future to unfold.

O. L. R.

Pittsburgh, Pa.

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Toward destiny

Julius Stulman

1

A Mental Pattern for the Planet

For I dipt into the future, far as the human eye could see,
Saw the vision of the world, and all the wonders that would be;
Saw the heavens fill with commerce, argosies of magic sails,
Pilots of the purple twilight, dropping down with costly bales;

Heard the heavens filled with shouting, and there rained a ghastly dew
From the nation's airy navies grappling in the central blue;
Far along the world-wide whisper of the south-wind rushing warm,
With the standards of the people plunging thro' the thunder-storm;

Till the war-drum throbb'd no longer, and the battle-flags were furl'd
In the Parliament of man, the Federation of the world.
There the common sense of most shall hold a fretful realm in awe,
And the kindly earth shall slumber, lapt in universal law.

Alfred Lord Tennyson, *Locksley Hall*

I. PLANNING: SUBJECTIVE AND OBJECTIVE

TODAY man's conception of man is undergoing a major change. Out of the new concept of man will emerge the neotypal idea that will shape our new culture. In the world that is now in process, man is learning to think of himself, not in egoistic terms as an absolute entity, but as a part of a single, planetary being, with the human race developing as the tip-end of the vast brain-nerve system of animate nature. Subtly united with his cosmic environment, man is moving

toward a higher bio-social integration in which radio and television and satellite hook-ups appear as precursors of the circulatory processes of the emerging giant earth organism. Such, perhaps, is the new concept of humankind that man is framing of himself.

This conception not only adds a novel dimension to reality—it presents us also with a unique view of the meaning of history. This theory, as it unfolds, will reveal the "cross action" of the "magnetic moments" of human evolution—the pattern for the gradual emergence of the giant organism of which mankind is the developing cerebral cortex. In a sense, the embryonic form of this super-organism is the morphogenetic field of *GAEA*—Mother Earth, the first born of Chaos, according to Greek mythology—now coming into full consciousness.

According to the view here striving to become articulate, the meaning of history is to be found in the onward and upward spiral towards the appearance of something completely new in social evolution: the development of a "specific organ of civilization" for the mobilizing of our energies and the unification of our social purposes. In a word, *human DNAs need to put together a marvelous new organ, the World Sensorium.* All this is required if man is to give human evolution meaning, thrust, and a sense of direction.

There is no road back. We must face the future. Perhaps we are too timid. As William James once put it, men are continually putting themselves in prison. The tremendous shocks to human consciousness in the coming years will find us unprepared, unless we learn that our plans for the future must keep men's minds open to guided change. Today we fumble because we lack vision. And because we lack creative imagination, there is still much defeatism in the world, and we search for methods to boost the sagging "morale" of an exhausted humanity.

The truth is that, much as we talk about it, we have not thoroughly analyzed the nature of morale. In the long run there is only one secure morale—the morale of enlightenment. This morale is not the phony stuff of the military mentality, nor the morale of the clergyman's incantations, nor yet the morale of the politician's promise of economic abundance. To build the morale of a planetary humanism—a supernational morale—requires time, and already the time is short for the job we have to do.

According to the theory of a cosmic humanism, the darkening clouds of social disaster curving over the great mass fields of the human drama cannot be dispelled until we synthesize a world outlook in which religion, science, art, and philosophy are co-ordinated with economic-political mechanisms to give common human life meaning and direction.

II. THE MORALE OF ENLIGHTENMENT

The cultural synthesis we have just referred to must provide a time-binding unification of the "magnetic moments" of history. The morale of enlightenment—planetism and global thinking—always seeks the threads of historical continuity. it recalls that at least twenty-five hundred years ago Mu-ti said,

> Let one love another as one's self; let a nation love another as its own. Let a sovereign love his subjects as himself.

This ethics, enunciated in the religion and the philosophy of the ancient East, was restated centuries later in the ethics of Jesus, wherein the divinity in man is transformed into the symbol, "The Father," and this, as the English critic Fausset realized, means *"all the potentialities of the past."*

Today the great masses of humanity no longer have a holding ground in the form of living memory. The "Christian" nations will hold on to Christmas; but then—in the absence of the GREAT VISION—there must eventually come the tidal downsweep, after which no one will listen to anyone, and we will have a "semantic suicide."

III. PLANETARY INTEGRATIONS

What we suffer from is a disintegration of culture arising from the fact that men have been made sick by too much revolving around their egocentric axes. Today the only axis worthy of its pivots is a global axis centered in a cosmic humanism. What the world needs are virtuosi who can evoke the manipulative genius of all mankind. If someone with creative vision could come along and dissolve old habits of thought, free men from their solidified mental patterns, he could emancipate the world from the financial and political prisons of our enslaved society.

If we could form the GREAT VISION, there could be a tremendous uprush to the cosmic humanism idea—the group upsurge to social creativity and unfoldment. The central difficulty with past humanisms is that they have tried to put an immensely simple message into WORDS, whereas such a message can best be written into the choreography of a universal picture language. The job is to find a layout, a picture-kinesics basis, so simple and so huge that it is seeable by anyone who has mastered the movies or can turn a radio-television dial. If it were possible to use the full play of international techniques made possible by a United Nations Communications Satellite System (for example, *The Prometheus-Krishna Project*), an

all-world drama could lift up the inner lives of peoples to their own transfiguration by sheer evocation of spiritual powers from within.

Our creative semanticists have said that "a magnificent humanity awaits upon a magnificent language"; but this language must be able to shrink all knowledge so that it can be put on an all-history, all-world basis for invariant transfer across the social wholes. Professor H. N. Wieman and Harold Rugg have tried to envisage a language whose devising shall constitute the major task of our great transition. In our topology of humanity this appears as a language of motion—a psychosocial motion or spiritual traveling. When this new language medium is created the energy of dynamic humanism—a group sublimation—will stream happily on its way, secure in the knowledge of the *BIG Idea* behind it all.

IV. ORTHOSYNTHESIS AND SPHERICAL HARMONICS

This is a methodization for democracy whereby man may know what to yield to and what to resist, producing peaceful change and resolving the mountain-molehill patterns existing throughout lifespace as directed vectors of change. People have failed to realize that developments in theoretical physics, in psychical research, in semantics, are as compulsive as industrial, economic and political events—and indeed sometimes accelerate them—so that the new culture perforce must be a social-semantic no less than an economic-political unification.

The world that is coming towards us is one that will provide a maximum of freedom from special linguistic frameworks. Mental shackles are forged by verbal habits, and a higher mental-verbal world will come with a broadening language-logical emancipation. In Indo-European civilization the basis structure has provided a common logic, a limited two-valued logic of "true" and "false." All "Aryan" tongues are akin, and anyone born to one, such as English or French, is already cousin to another of the same family. But certain types of Oriental thought were never thus restricted to the either-or logic, and have in this respect possessed a greater measure of freedom from limitation.

But what is to be the new invariant symbolism, free from special linguistic frameworks? It is a curious fact that thus far mathematical symbolism and musical scoring are the only international "languages" that Western civilization has developed, and this suggests that perhaps music promises to satisfy better than any other medium the requirements of a universal aesthetic language. This is especially important if the object of the study of science, the Cosmos, and the

object of emotional apprehension, music, turn out to be applications of a more fundamental science of mathematical logic, the study of abstract order-systems.

An interesting application of this idea is afforded by the study of what Pythagoras, in the days of ancient Greek culture, called the "music of the spheres," but which in modern thought is studied under the general heading of *spherical harmonics.* For our part, we would like to see included in this our favorite musical-mathematical concept of the *music logarithmic spiral.* In spherical harmonics one studies how functions are spread over spherical surfaces. The result, in some cases, may look like a globe's lines of latitude and longitude—in general, symmetrical patterns. This method not only has wide applications in electricity, but, as will someday appear, has possibilities of development through the treatment of electromagnetic fields of force at work in biological and other superphysical phenomena.

V. ENERGY FIELDS AND GLOBAL SEMANTICS

The formative figures of the future will be creative semanticists. The problem of global semantics—that of social communication across the world-whole, speaking to all races and nations as one—is bound up with the problem of developing a technique for releasing one of those great energy-burstings, or social orgasms, necessary to the creation of a new World Form. This, we believe, is the problem of mobilizing human energies and guiding them constructively through the head-heart-hand syntheses. Surely the endless stirrings of today are symptomatic of the accumulation of the tremendous emotional reserves of humankind. They are the forerunners either of sadistic destruction of all existing forms, or the prelude to the coming into being of some giant form of the future. Which it is to be, man must decide.

To attain this new form, what is needed is wave on wave of "great striking acts"—energy-bursts that sweep over walls and tunnel through barriers and give history a new perspective. We must learn how to muster an authority capable of casting a spell over humanity and creating a new design for planetary existence. We are approaching the climax for which we have been building a rich memory bank and resources.

As an alternative to Marxism—already long obsolete—we propose a more futuristic orientation—the theory of planetary humanism. Our view is that the coming universal civilization will have to fuse many of the features of a variety of political, economic, and religious

systems. In this planetary culture the religions and the philosophies of the Orient will have their contributions to make. In its functioning the World Sensorium, the formal organ of integration for this planetary civilization, will transcend many of our present fragmented social mechanisms and concepts. For the present, our basic problem is that of envisaging the projective geometry capable of producing the synthesis of psychobiological forces and social vectors. This is also, and more fundamentally, a matter of forming an imaginary map of a territory-to-be.

The Cosmic Humanists believe that they have some of the important pieces of this map. Their formulations, they hope, are a portent of the highly effective idealism that men must have, if the presently non-existent territory is to be brought into the domain of social reality. While this view takes as its point of departure a map of an actual territory, and in that sense rests upon a factual world as this is now revealed by science, it soon leaves the world as it is and moves into the world of ideals as sought-for realities. Cosmic Humanism seeks to create a space-time drama of epic proportions which shall embody and express the social analogue of Minkowski's space-time continuum in the geometry of a four-dimensional matrix. But Cosmic Humanism finds a need for higher meta-dimensional realities and concepts.

In brief, just as the physicist now interprets physical events in terms of field structures curving the space-time continuum, so in our psychodynamics social adjustments, like spatio-temporal relations, are also held to express curvature; no human act is isolated—it, too, is a part of a *Psi*-field continuum and moves back upon itself through a kind of social karma. Following this conception, Cosmic Humanism seeks to discover those relations which, like public time, are transposable across the social whole, which in the broadest context is Humanity in its collective unity.

VI. THE SPIRAL OF HISTORY

The future of man rests with man in relation to cosmic guiding fields, and when men have mastered the art of bending the curve of the field continuum into the world-encircling spiral of a time-binding synthesis, he will, at long last, have brought into being the higher dimension of a giant world organism, the emergent World Sensorium that we shall be studying in the following chapters. To bring into being this world organism requires not only an ecstatic urge—an energic streaming as a form-creating social organism—but it requires also intelligent planetary planning to guide the embryological

development of the organism-to-be. We repeat: in order to attain planetary goodness and beauty, we need VISION, a vision so wide and so compelling that it transcends all narrow limitations and triumphs over all separatist tendencies.

When we get that vision, and the new balance of forces expressive of that wisdom, we shall have the psychological revolution to which all history is the buildup. Once the consciousness of universal relationships is planetarily established, we shall find that the idea of a common destiny for all mankind is no mere fantasy of wishful thinking, but a legitimate objective of human aspiration. Indeed, the vision already seems to have been proclaimed by Alfred Lord Tennyson in his famous lines in Locksley Hall (as quoted at this chapter's head), where, like Walt Whitman's bard "who walks in advance," the poet paints a vision of the future.

Tennyson's preview of the kindly earth resting under the reign of universal law will demand immense constructive work for its consummation. But surely one important step in the direction of the attainment of the "parliament of man" is a psychological revolution to sublimate and transmute the technological revolution. This is the task of the new alchemy. If history is to have any meaning at all, we humans must project creatively the curve of biocosmic evolution and weave the fabric of a higher consciousness. Man's greatest mission is to salvage the pageant of history from the dark domain of frustration and insanity and give history a time-spanning purpose—and this can be done only by cross-webbing the cultures of the peoples of the earth into the Federation of the World. How the globe's geophysical field-reversals have assisted in the weaving of the woof and the warp of the evolving patterns that are the "magnetic moments" is the problem and the challenge of our study. The meaning of history is not "writ in the heavens"—completely—it is also the lure of the "one, far-off divine event" toward which our own galaxy is moving in time's logarithmic music spiral. At any rate, is it not worth a "whirl"?

2

Language and World Order

> It has never been in my power to study anything—mathematics, ethics, metaphysics, psychology, phonetics, optics, chemistry, comparative anatomy, astronomy, gravitation, thermodynamics, economics, the history of science, whist, men and women, wine, meteorology—except as a study of semeiotics.
>
> Charles S. Peirce, *Letter to Lady Welby.*

I. THE ROLE OF SYMBOLISM IN HUMAN EXISTENCE

THE SUBJECT of this chapter is "language and world order." Here we are concerned with the role of symbolisms in creating the conditions for man's social life, the maintaining of cultural traditions over the generations, and the promotion of intellectual progress in the future—such as it may be—that lies ahead for mankind. In attempting this broad survey of the nature and functions of symbols, we need some understanding of the terms we shall be utilizing. A few definitions are therefore in order.

First of all, *language.* Assuredly we can agree that a language is a set of symbols, created for the purpose of communication, which can be recognized through any of the sense modalities—or extrasensory modalities if there be such. These symbols "stand for" or "represent" those components of human experience that can become public property. They are created by human beings to establish contacts with other human beings, through the sense of touch, hearing, vision, and other receptor channels. Simple or complex in structure, symbols embody and express emotional, conceptual, and imaginative contents. The symbols themselves may be single entities, like

individual words, gestures, ideograms, and the like; or they may be more complex but recognizable entities strung together in sequence to form sentences or other meaningful configurations.

All this, of course, grows out of man's need to communicate—something very deep-rooted in human nature. It may be that man's fear of death is really fear of excommunication.

Ordinarily we think of language in terms of written or spoken words. But we know that we should not restrict language to such narrow limits. There are many forms of "non-verbal communication." We frequently speak of the language of the arts, and here we may have in mind the visual arts, such as sculpture, architecture, pantomime, painting, and the like; or we may refer to the arts of time, such as music, the dance, drama, and the rest. Actually the "arts of space" and the "arts of time" overlap, so that we really have space-time languages. Today we even refer to the "language of the computer," and here again the space and time arts overlap, so that we have space-time languages.

From the very outset, we recognize the universal importance of the role of symbolisms in human life. Indeed, those who are overwhelmed by what one student has termed "the mystery, the miracle and the magic of language" have urged that "language must come from God."[1] In that case one wonders what particular language God employed—whether ancient Hebrew, modern Esperanto, or some other. For my part, as a neo-Pythagorean I would propose to register a claim for the language of musical mathematics—that later will be dealt with under the term "spherical music"—as the language of nature. But more of that subsequently.

We have observed that symbols are tokens or signs which refer to something else, a something which is called its "referent"—a real or imaginary entity (imaginary like Dante's "Celestial Rose"), which may or may not be present in the environment. This power of imagination gives man great ingenuity, but is also fraught with dangers to his "sanity." Human civilization is a fabric woven on the loom of time from the structures of symbols. Without symbols civilization could not exist. With reference to mankind's cultures, one might say of the peoples in them that they—and we too—are *symbol creators*, *symbol preservers*, and *symbol destroyers*. Thus languages appear as two-edged swords of creation and destruction.

Now let us turn to the other half of our topic, that of *world order*.

What kind of "world order" are we here concerned with? Surely one obvious distinction is between a loosely organized or "open" society and a tightly knit or "closed" society of a "totalitarian" form of social order. At the present time we have a loose world order, such as that embodied in the present United Nations organization. Those

of us who believe in the necessity for a world federation will want to foster the forces and agencies working toward political and economic integration, thus tightening up somewhat the loose order into a planetary federation of friendly peoples. My own term for this federation is a "Planetary Democracy." But whatever form of "world order" one may advocate, it will have to be created through the use of languages, employed as media of persuasion, and this brings us back to the role of symbols in human life.

II. THE HISTORY OF THE LANGUAGE PROBLEM

In order to survey the role of symbols in human affairs, let us glance at some of the studies in this field. The ancient Greeks in their *Logos* doctrine—which had its adumbration in Egyptian and Hindu cultures—recognized the intimate relation between language and thought (reason), for the word *Logos* means both speech and thought. Well might Plato declare that "thinking is the soul's conversation with itself"—and this could be regarded as some sort of anticipation of the Behaviorist's assertion that "thinking is subvocal speech."

Pausing for a moment to comment on this, it seems established that, regardless of one's preferred metaphysics students of evolutionary biology will agree that biological evolution reaches its highest peak in the cephalization of the human nervous system, which has made possible the displacement of biological energies from overt muscular response to *thought as the imaginative and symbolic substitute for overt bodily behavior.* With the coming of human social life the processes of communication have become the medium for *cultural heredity.* Thus it is that thinking-feeling-speaking has become the common denominator of social integration and creative activity in the arts and crafts, religions, philosophies, and the sciences, produced by man.

Returning to our rapid survey of the history of studies in this field, one may use the Middle Ages as the bridge spanning the era of the classical Greek civilization and the modern world, mentioning in passing only the work of the Medieval *nominalists* as worthy of close study.

In modern times the early important work in the field of the language problems really begins with Francis Bacon, John Locke, Leibniz, Lady Victoria Welby, and our own Charles S. Peirce. Peirce was the founder of *Semeiotics,* a field now better known under the rubric of *Semantics,* the term made popular by Michael Bréal, Alfred Korzybski, S. I. Hayakawa, and the General Semanticists.

III. SOME CONTEMPORARY STUDENTS

Let us turn now to one of the important developments in contemporary linguistics, a discovery made by scholars in philosophy and anthropology. The discovery is that *language itself is a philosophy,* and that in employing this or that language (usually one's own "native tongue"), the structure of the language is superimposed upon the world which it supposedly refers to and describes. The usual example of this is the Indo-European family of languages of the Western world, with its *subject-predicate* (or *substance-attribute*) type of description. The realization of this fact is not the peculiar discovery of the General Semanticists, though Korzybski made much of the principle. The linguist A. H. Sayce and others recognized the manner in which the subject- predicate sentence prejudiced our view of the world. Bergson, Whitehead, and Russell, and other modern philosophers also, in different ways, have been guided in their philosophies by these developments.

One other contemporary student in the field of philosophy whom we should mention at this point is Charles W. Morris. Professor Morris's earlier work, *Signs, Language and Behavior,* was later supplemented by another volume, *Signification and Significance: A Study of the Relations of Signs and Values.* In this latter study Morris stresses that human symbols do not merely refer to or describe other things; *they also evaluate them,* and prescribe how to react to them. In brief, *peoples of different cultures see each other darkly through culturally ground symbolic lenses.*

It need not be emphasized that this is now a well established principle, accepted by philosophers and confirmed by anthropologists in many empirical studies. The one social scientist in this field to whom most credit is assigned is Benjamin Lee Whorf, whose generalization is now a part of what is termed the Sapir-Whorf hypothesis.

IV. THE SAPIR-WHORF HYPOTHESIS

All students in the field are familiar with the thesis that each language of each distinct culture inclines the people of that culture toward a certain world-view, i.e., that the linguistic-grammatical forms of the language embody certain implicit "propositions" and forms of epistemology and ontology—a theory of knowledge and of being. This view has been well stated by Clyde Kluckhohn in his book, *Mirror for Man.* It should be noted, however, that the view that different languages express different "pictures of the world"

does not necessarily lead to a cultural and philosophical relativism. Indeed, in his review of my book, *The Promise of Scientific Humanism* (1940), in *Main Currents of Modern Thought,* (March 1941, pp. 12-14), Mr. Whorf approves of the three-level scheme of the evolution of human thought therein developed.

Having said this, we must remember that we still have before us the problem of what may be called the language-centric predicament, namely, that we must use language to think and talk about language. We have urged that the implication of this "predicament" is not skepticism or nihilism. If there were no escape from ego-centrism and cultural relativism, how could one explain the fact that science has become a transcultural achievement, especially when expressed in terms of the language of mathematics? Individuals in Oriental civilizations are studying Western science, as a matter of self-preservation if for no other reason. After all, the formula for the atom bomb is expressed in Einstein's equation, $E=m.c^2$, and what could be more important for survival?

The simple fact is that "maps" and "territories," "languages" and the "realities" they picture, are—when properly employed—two parts of a cybernetic feed-back relation, with approximations to homomorphisms operating between them over periods of time.

There are others whom we might mention in our rapid survey of significant figures in the field of communication. One of them is the poet Robert Graves, who has developed the idea that communication between brain and brain was first achieved by some sort of obscure telepathy, next by spoken words, and then by written words (see his *Nine Hundred Iron Chariots*). But this seems to overlook the role of picture-writing or ideograms. I mention this in this digression in order to call attention to the possibility that "picture-writing" may someday be restored in a kind of semantography, such as Charles Bliss of Australia has perfected.

V. MARSHALL MCLUHAN'S THEORIES

Of course, no matter whom else we may pass over, we simply cannot overlook the widely advertised and much heralded contributions of that high priest of communication (or perhaps non-communication), Marshall McLuhan. In a personal communication to the writer, following my "Project Prometheus" proposal in 1962, McLuhan wrote me as follows:

> Telstar presents a fascinating example of a new technology which is about to become environmental. Until it becomes total, its effects do not appear. Until a particular form reaches a certain level of saturation, it exists merely as the content of an earlier environment. At a certain threshold, however, it ceases to

be content and becomes environmental. The old environment then becomes the content of this new one, even as films appear to be the content of TV.

. . . But at the moment these forms cease to be the content of an existing environment and become environmental themselves, their full freight of characteristics move action. At this point the entire ground rules of society are shifted. The inner sensory order changes as much as the outer patterns of work and association. Thus radio alters the visual habits of a society in ways quite distinct from the stepping up of visual culture by means of literacy. These matters have never been studied . . . It is a great shame that the rich opportunities of this sort are being missed today.

In another letter to my friend, the late Miss Blodwen Davies, Professor McLuhan has this to say:

My concern has been with the psychic and social consequences of the age-old extensions of our bodies and our senses. In the electric age we have extended the central nervous system. Put our brains outside and our bodies inside. In an evolutionary sense such a mutation would seem a precarious venture towards the heightening of consciousness. Each extension shifts the proportions among our senses, creating a new outlook for reference in entire populations, quite independently of ideas or verbalization. There is great loss of autonomy and freedom when such extensions are new.

The reader knows, of course, of McLuhan's ideas about the "electric age." In his book, *Understanding Media,* Professor McLuhan tells us:

It is a principal aspect of the electric age that it establishes a global network that has much the character of our central nervous system. Our central nervous system is not merely an electric network, but constitutes a single unified field of experience.

This thesis concerning the emergence of *homo electronicus* and the new culture enunciated by McLuhan is not his exclusive and original discovery. Aside from some others, it has long been an integral part of my own theory of mankind as the emerging "world sensorium" of the giant earth-organism, with the two hemispheres of the revolving globe functioning as the lobes of a world brain, spinning out *via* the armature of the earth-dynamo the lines of force of an emerging electromagnetic society. There will be much more on this in later parts of this book.

It will be noted that one of the disturbing questions raised by Marshall McLuhan and others relates to the problem of the long-range effects of technology and automation in our society. In order to be certain that the "pattern of the environment," where "the medium becomes the message," will in fact be humanistic, we obviously must maintain control of the "patterns" and their consequences. The effects of environmental patterns sooner or later turn into history, and history even now is being written. Obviously the need for the conscious control of technologies and their consequences is growing at a tremendously fast pace.

This brings us to one of the theses of the present variety of Cosmic Humanism, namely, that human evolution can no longer be left to unguided factors of that evolution—traditions, vested interests, inherited institutions and motivations, mental laziness, prejudice, power politics, and other non-rational forces. Mankind must now take the next step: the conscious control or guidance of human evolution. This control alone can bring into being the "world order" that intelligent men can approve of and try to implement.

Our contention is that if present trends continue, the world will soon be on the road to what we have called "semantic suicide." This will come about through the erosion of our traditional culture-bound symbolisms and their associated values and loyalties. We will then be in a situation where we do not have a common "language" of accepted meanings; no one will understand or listen to anyone else; and what is worse, there will be no plans for a cultural and semantic rebirth of mankind. It is regrettable that some philosophers deny that philosophy has any such "mission" as we have assigned to it. To see that this is no exaggeration, let us examine briefly the views of the positivists and the linguistic analysts.

VI. LANGUAGE AND HUMAN NATURE

What made Logical Positivism so attractive, until its recent demise, was its superficially convincing analysis of the functions of language, along with the assignment of roles according to these functions (uses). This classification may be traced back to the Ogden-Richards analysis as presented in their influential book, *The Meaning of Meaning,* an analysis rather widely accepted by Herbert Feigl, Rudolf Carnap, and other anti-metaphysical Positivists. This was the schematism:

Functions of Language	Cognitive	1)	Formal mode of speech (Logic and Mathematics)
		2)	Material mode of speech (Physics)
	Emotive	1)	Poetry and Drama
		2)	Religion and Metaphysics

One of the witticisms of this viewpoint in its heyday was embodied in the pronouncement that "metaphysics is simply bad

grammar," i.e., it is a result of the confusion of several of the above modes of speech. This view was also illustrated by the statement of Carnap that "there is no ethics in logic," which was then open to the interpretation that "there is no logic in ethics." In general it was held that the field of value judgments (normative ethics) is excluded from the domain of natural science; "values" belong in the realm of personal preferences and wishful thinking. As we have insisted on other occasions, this way of "doing" philosophy is based on an obsolete "faculty psychology" of human nature, i.e., of "cognitive" and "emotive" functions, and a corresponding class structured society of "scientists," "humanists," and so on. This, of course, is not in line with later and more enlightened organismic and wholistic principles.

In a moment I shall propose another classification of the uses of language, one which permits ethics (values) and the natural sciences to enter into more conjugal and symbiotic relationships. The odious positivistic-linguistic viewpoint that philosophical problems are "mental cramps" which require "linguistic therapy" is today not very helpful to a distraught mankind.

If, however, for one reason or another, the two fields of the natural sciences and the normative sciences are fragmented into two mutually exclusive domains, then the synoptic task of the integration of these various fields into the conscious guidance of human evolution must become far more important than we have thus far recognized. Wisdom must then, as with Pythagoras and Plato in ancient times, once more become the supreme overlord, the great synoptic vision and instrument of social guidance.

VII. COMMUNICATION AND THE WORLD'S LANGUAGES

Obviously much remains to be done, if we are to move toward the "coming world civilization" of a Planetary Democracy. The fabrication of a federation of friendly peoples seems to imply three things, as follows:

1) The clear recognition and social acceptance of some overall planetary objectives. These will constitute those *minimal* political, economic, and ideological agreements which the member nations of a world federation can agree upon as essential to world peace, plenitude, and international justice.

2) The development and acceptance of a world language. One might think here of the type of study illustrated by Mario Pei's useful volume, *One Language for the World and How to Achieve It* (1958). Here Professor Pei gives us a survey of the world's linguistic

Tower of Babel, with an examination of the relative merits of Esperanto, Interlingua, and the other proposed candidates for a universal language. But what I have in mind is more fundamental. It starts from the premise that if we "think" in languages, then to change our thinking we must refashion our language, *and this must include any "false" assumptions contained in existing languages*—this in accordance with the principles of the Sapir-Whorf doctrine as already discussed.

3) The third requirement is that we need to perfect global techniques for disseminating and achieving the objectives mentioned in 1) and 2), above. As we create and revise our planetary objectives and develop a world symbolism for expressing them, we need also to gain access to the global TV and Radio facilities for satellite communication. What I have put forth as *Project Prometheus and Krishna*, or something like it, must be put into orbit around the world. In some ways the global language we wish to see created and utilized will be a "new" language, perhaps even some new art form, and that is a big job still to be undertaken and completed. Part of the operation will be the perfection of a "creative semantics," previously referred to.

VIII. THE ROLE OF CREATIVE SEMANTICS

Before one undertakes to initiate a program for a world communication symbolism, one must be certain that such an enterprise is both possible and necessary. We must therefore ask ourselves two questions:

1) Does a world language guarantee international and intercultural understanding and cooperation? Obviously, the answer is *no*. One thinks here of the oft-repeated characterization of the British and the Americans as "two peoples separated by a common language."

2) Could one achieve the objectives of understanding and cooperation—a Planetary Democracy—without a world language? Again the answer is *no*.

What this means is that a world language is a necessary but not a sufficient condition for what the late William E. Hocking termed the "coming world civilization." This may not seem obvious, but my own confidence in the essential role of a new world language derives from a prior belief that the heroic effort necessary to invent and implement a world language vehicle—a global semantics—is part of the conscious collaboration on the part of world scholars who will thus help to guide mankind away from an impending debacle.

In developing this thesis it is essential to stress the distinction between the two types of semantics that were previously urged as a supplement to the work of the linguistic analysts. These two types are as follows:

Types of Semantics

1) Critical or Descriptive Semantics: how words are used in the existing languages of the world.

2) Creative Semantics: what words ought to mean in a reconstructed society.

The first type of semantics is perhaps best exemplified by the "ordinary language analysis" of the Oxford school, as illustrated by Wittgensteinian and Austinian analyses. The second type is concerned not only with what words *do* mean in ordinary discourse ("the meaning of *so* in *so what*"!), but with what words *ought to mean* in the new contexts of an evolving society. For example, what is a "decent living wage," "adequate housing," "quality education," and so on, in a more "ideal" society? Historically this latter type of semantics is illustrated in Plato's *Republic,* a model Utopia which never was before. And when Franklin Roosevelt's "New Deal" brought in "industrial democracy" as a complement to the merely political components, he introduced a new definition of "democracy" as something that went beyond the Jeffersonian conception of the eighteenth century. Now, today, we are beginning to realize that democracy cannot be safe anywhere in the world until it is safe everywhere as Woodrow Wilson foresaw—and that, ultimately, requires a Planetary Democracy.

In this creative semantics one tries to do two things: (1) reinterpret old symbols for use in novel circumstances; and (2) create new symbols for a new world with its new language. These two functions intermingle and are so closely interwoven in our speech that it is difficult to separate them. But one should be conscious of the occasions when he is introducing new concepts and definitions. A creative thinker like A. N. Whitehead faces a dilemma: to express the novel concepts of his system of thought he can use old terms with their new meanings (definitions), in which case he will be misunderstood; or he may create a new terminology for his novel concepts, in which case no one will understand him fully. The moral of this seems to be that a timid soul should not be a creative thinker, unless he has courage beyond the line of duty.

The job of creating a new world language is both difficult and challenging. This point has been made by Colin Wilson in his book, *The New Existentialism,* where (p. 138) he states:

> . . .genuine "new language" is difficult to create. It is analogous to building a road into the wilderness. Our ordinary language is definite because it has a scaffolding of everyday experience around it, and this scaffolding acts as a co-ordinate system, enabling one to define any point with a certain precision. But to give a word a definite meaning, one has to erect a system of scaffolding to support it . . . In the same way, a student of mathematics would find it difficult to define a Bessel function for the benefit of a non-mathematician—simply because such a complex idea cannot be defined except within a "scaffolding" of mathematics.

According to Winifred Babcock, who has developed this idea, in ordinary discourse the scaffolding is as much composed of, and committed to, beliefs in philosophical ideas as it is to "everyday" experiences. When these ideas and words lose their meanings, man's purposeful experience is gone. The nexus between purposeful existence and meaningful words, with the concomitant ability to communicate, is difficult to trace—but it is there. In our contemporary world the "scaffolding" has collapsed around such words as "God," "existence," "soul," "life," and other terms of our traditional vocabularies. And when words have lost their meanings, physical communication *via* radio, TV, the flood of printed materials, and the like, will have little effect, other than to separate rather than unify—a sort of Tower of Babel effect.

In this situation what is required is not only the reinterpretation of old symbols by rebuilding the scaffolding around them; but equally importantly, savants, scientists, philosophers, and artists will need to create a new world-picture, along with a corresponding set of symbols *for the coming new era of mankind.* To this urgent task we now turn our attention. Here the thesis will be developed that a radical reconstruction of traditional religious doctrines, ritual, and forms of prayer and worship must be created. In addition, there must be the thrust toward the morphogenesis of a world-emergent religion—still to be conceived in its main features. Only the drive toward urgent and overarching goals will elicit the full resources of men the world over. To outline some of the features of this new world religion, it will be necessary to address ourselves to four major tasks, as follows:

First, in order to illustrate the "creative semantics in action" previously mentioned, I shall present a preview of this proposed world religion. This world view, termed *Cosmic Humanism,* will introduce some novel concepts and terms.

Secondly, since it will soon be obvious that this proposed new world religion does violence to some time-honored notions of what

religion "is," and how "God" is to be comprehended, it is essential to present an exposition of the historical forms of "religions" as these have evolved, to the end that we may thereby justify our departures from traditionalism in favor of a religiously motivated *Planetary Democracy* as the form of a "coming world civilization."

Thirdly, it will be helpful and appropriate to outline some of the psychological and social principles of this emerging world view.

Finally, we take the liberty of suggesting how new technologies—one in particular—may be employed to implement the novel conceptions, ceremonials, and litany, however sketchily these are delineated in our very imperfect outline.

Clearly it is not possible in the present small volume to present in proper scope an adequate exposition and defense of *Cosmic Humanism*. A beginning has been made in this direction in a book devoted to this topic. Moreover, others must participate in this enterprise. It is possible here only to hint at what a fuller exposition might provide. Aside from other limitations, the scaffolding for the structure is still incomplete, and constructions are still under way. Nevertheless, we wish to preview the growing edifice, rising in our elevator from the bottom to the upper levels of our open-ended and rather wobbly scaffolding.

At the outset, Cosmic Humanism's main criticism of traditional theistic religions is their cardinal error of the separation of God and Nature, the Divine and the Human. The pantheistic dimension of Cosmic Humanism is tied in with the doctrine that, in a sense, "man is not alone"; that is to say, there is something in the vast cosmos that answers to, or resonates with, the fundamental tones of man's inner nature. Man's privilege, therefore, is to cooperate with cosmic guiding fields of force to stimulate his own self-evolution toward higher forms of consciousness. In a *Cosmic Humanism* the highest integrative field is termed the *Cosmic Imagination*, a new symbol and word in the language of a Cosmic Humanism.

Quite inevitably, and contrary to traditional theisms, the cosmology of this world-view requires that the cosmos be unbegotten, though "creation" does take place here and there in all areas of cosmogonic space. Thus a modern Cosmic Humanism embraces the view of Giordano Bruno and Spinoza—the notion of a cosmos everlasting in time and infinite in space, with the Cosmic Field of Energy as the "soul" of the universe. The reciprocal conversion of energy and matter is sustained by a cosmic feed-back between "matter" and "waves of energy"; and from the infinite bosom of the Cosmic Field everything emerges, from "elementary particles" on up through the levels of atoms, molecules, cells, organisms, to human societies—all this in the ascending order of the

rungs of the ladder of emergent evolution. Each of these natural configurations of "particles" is unified by an organizing field of energy and is *ensouled,* as the doctrine of *panpsychism* has affirmed.

In this connection there is the interesting problem of whether there may be other sentient and intelligent beings in this infinite cosmos. One may recall that Giordano Bruno did suppose that such beings do exist in other parts of the "infinite universe." Here the present variety of Cosmic Humanism would agree, and add that perhaps it was those Intelligences—"out there"—who planned the colonization of the earth and shot the materials of life in its primitive form to our planet, with built-in instructions which we now name the *DNA* helix. This leaves it to us humans—once we finally emerged—to write the book of human history as the story of man's deliberate effort to build a guidance system for conscious human evolution. Back to the Cosmic Imagination!

IX. THE EVOLUTION OF RELIGION

Another phase of our program has to do with our proposed revision of accepted notions of what religion "is." We are here specifically concerned with one criticism of the proposed religion of Cosmic Humanism, namely, that it does violence to firmly established notions of "God." This part of our treatment will take us further into the field of creative semantics. In a general way, our remarks will focus on the problem of *what religion is*, and *what God is*. This will turn out to be a rather difficult undertaking.

When it comes to formulating a definition of the term referring to any collection of objects, events, or phenomena (such as the term "religion"), the logicians tell us that it is necessary to decide what is to be included, i.e., give the *connotation* and *denotation*, or range of application, of the term. In the case of religion this range of inclusion is extraordinarily difficult to determine. Many forms of "religion" have existed in the long history of human cultures. One scholar has estimated that since the time of Neanderthal man, approximately 100,000 religions have appeared on this planet. And in the United States today there are hundreds of religious sects and denominations, most of them having a small number of adherents. For this reason, it is well to insist on a definition of terms before becoming involved in arguments, for example, about the "conflict between science and religion," the "future of religion," and so on.

Here is my listing of the major forms of religion—six in number as it turns out—as these have appeared in man's social development. These are arranged in the order of historical evolution:

1) The *animistic religions* of primitive societies, where men project

spirits into nature; and this includes also the magic, ritual, and sacrifices associated with them.

2) *Polytheism*—the worship of many gods, as in the ancient Greek and Roman religions.

3) *Henotheism*—the form of religion that provides the bridge between, and transition from, polytheism to monotheism.

4) *Monotheism*—the belief in and worship of one God, as in the Egyptian religion of Atonism; Judaism; Christianity (if we ignore the Trinitarian components); Islam, the religion of the Moslems; and so on.

5) *Pantheism*—the belief-system of the Roman Stoics; Giordano Bruno; Spinoza; Goethe; English Lake Poets; Emerson; Thoreau; Whitman; and most recently, Albert Einstein ("yes, I believe in the God of Spinoza," said Einstein when asked.).

6) *Ethical-social reform movements*—such as Humanism; Ethical Culture; Communism; Fascism; Nazism; and others.

It may come as a surprise to note the inclusion of (5) and (6) in the above list. I will agree that they should *not* appear in a final listing; but they are there included as *possible* candidates. I am now thinking of such statements as we have all heard: "the communists haven't gotten rid of religion; they have simply substituted the religion of atheism for the traditional religion of Russia." Or the statement, "playing golf is his religion." And similar claims.

We will require a definition tight enough to exclude such loose use of language. Surely when a word means so much that it includes everything, it is useless in our thinking and discourse. And so when Harry Emerson Fosdick declared that Nazism was a religion—"though a bad one"—this was an improper use of language. And when others describe Fascism and Communism as "secular religions," this, too, is conducive to confusion.

The definition that I prefer is the *New Century Dictionary* definition, which runs as follows:

> Religion is the recognition on the part of man of a controlling, superhuman power entitled to reverence and worship.

I would prefer to substitute "belief in" for "recognition of," but otherwise the definition seems satisfactory.

Please note that the word is *superhuman,* not *supernatural.* These are not synonymous terms. If something is "supernatural," it must be "superhuman"; but if it is "superhuman" (for example, the Stoic's *divine fire* or Emerson's *Oversoul*), it is not necessarily "supernatural."

Now then, does this definition exclude Communism, Fascism, and Nazism as religions? I would say *yes*—there is neither supernaturalism nor superhumanism in any of them (provided we exclude the Nazi *Übermensch* from "superhumanism").

Could they become religions, under certain circumstances? Yes, if there is a deification of the human individual who then becomes the "founder" of a new religion. If Hitler had won the last war, he would probably have been deified, as the old Roman emperors were the objects of apotheosis, and we would then have had another religion. If Hitler had won the war, we would all be Nazis—or we would be dead. And if Karl Marx and/or Lenin were escalated into something more than man and the *Communist Manifesto* became a new Mosaic *Decalogue*, Communism would become a religion. There may be some tendencies in that direction—to substitute Marx for Moses—but the leaders of Communism in the U.S.S.R. have warned against the "cult of personality."

Now how about Humanism?

X. IS HUMANISM A RELIGION?

So long as it has nothing of the supernatural or the superhuman in it, Humanism is a non-religious or secular social movement. But some of the Unitarian ministers who, early in the 1930s, helped to found the extant American Humanist Association, still want to cling to, or restore, the religious aura, and so they have recently started a splinter group called "Religious Humanism."

Another of those who wants to add a religious ingredient to contemporary Humanism is Sir Julian Huxley. Sir Julian was elected "Humanist of the Year" in 1962. In an address published in the *Humanist* (Jan-Feb, 1962), under the title, "The Coming New Religion of Humanism," Sir Julian stated:

> I feel sure that the world will see the birth of a new religion based on what I have called evolutionary humanism.

In formulating the tenets of this new religion, Sir Julian employs the concept of the *divine*. This idea is said to be free from theism (the belief in a personal God); but the divine is described as a super-personal something which "transcends nature." This is rather vague language, and it inevitably disturbed some hard-line Humanists, like Dr. Harry Elmer Barnes, who, in a subsequent issue of the *Humanist,* attacked this thesis and argued that Huxley's statement is a "truly noble and eloquent Unitarian sermon"—*but it is not Humanism.* This means that Dr. Barnes, and others, object to using any of the survivals of the old religious terminology in defining the nature of

contemporary Humanism, which they want to maintain as a secular philosophy.

In this debate I am compelled to side with Sir Julian Huxley. The reinterpretations of old terms and ideas have gone on over the centuries and must continue if we are to have progress. It seems to me that a creative thinker should be free to redefine his terms, provided he has paid the price for this right. This is the case with all freedoms—it must be a responsible freedom. This requires that certain conditions must be met: one must earn the right to tinker with ideas and with terminology; he must also know what he is doing and be prepared to take the consequences. The creative thinker must be prepared to explain and defend his new concepts and terminology, and be prepared to die for them if they are that important. The statement of Humpty-Dumpty in Lewis Carroll's *Through the Looking Glass* is correct: "When *I* use a word," Humpty-Dumpty said in a rather scornful tone, "it means just what I choose it to mean—neither more nor less." This is quite correct so long as Humpty-Dumpty doesn't want to communicate with others—but who wants a perpetual monologue! Perhaps he could not be put back together again, after falling off the wall, because he couldn't explain to anyone what had happened and what needed to be done?

From this we see that reinterpretation of old concepts brings one problems. But there are problems no matter what. As already indicated, the innovative thinker faces a dilemma: if he uses the old terminology for his new ideas, people will misunderstand him; and if he invents a new terminology, he will not be understood. So one must compromise: use some of the *old* words to explain *new* concepts—a little of both—and hope for the best.

It seems to me that Sir Julian Huxley has tried to observe sound semantic principles in his statement of the new religion of Evolutionary Humanism. However, what Sir Julian means precisely by the "divine" as something superpersonal, but not supernatural, is his problem. Hopefully he will clear this up some day.

We have insisted that the type of reinterpretation we have in mind is not only a privilege, but an obligation—so long as we hope to have human progress. As previously pointed out, this is illustrated by the transition from the 18th century democracy of Thomas Jefferson to the 20th century democracy of a world changed by the industrial revolution and the second revolution, automation. Some words have changed radically in their meanings over the centuries. What new components may need to be added to a vision of a *Planetary Democracy* is for the future to decide. *Perhaps a pantheistic religious dimension must be added to become part of the high rising scaffolding.* Let us see.

XI. THOUGHTS ON GOD, NATURE, AND MAN

It is time to turn to a consideration of the evolving ideas about "God." The history of the development of man's concepts about "Deity" is part of the history of the language of religion; but it is also the story of evolving human experience. We do not have time for a full exploration. It is sufficient for us to note that in the traditional (orthodox) varieties of Christian theology, God was considered to be the supernatural Creator of the universe, the "First Cause," who made the world at some definite time in the past (4004 B.C. is the date given by Bishop Ussher; 5 billion years ago, according to Abbé Lemaître); He then created Adam and Eve as the first parents of the human race; and subsequently He performed the hundreds of miracles recorded in the *Old* and the *New Testament*. Those raised in the traditional Judaeo-Christian ideology were taught to accept the teaching that Holy Scripture is the "Word of God," revealed to man, and this "verbal inspiration" of Scripture is but another of the miracles of the one "true" religion.

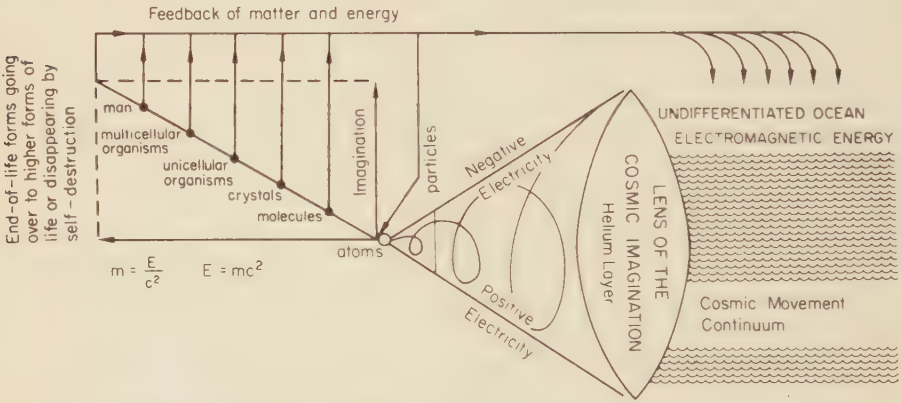
Those who are influenced in their thinking by modern science and philosophy find it difficult to believe in the God of the orthodox Biblical interpretation. Even the theologians are now having their doubts. The current "Death of God" theology is a manifestation of this increasing skepticism—or godlessness, if you prefer. Humanists, I surmise, would say that they are not much interested in this debate. They would urge that they can't lament the "death of God," because He never was alive anyway.

For some individuals the passing of traditional theism leaves only two alternatives, namely, *Agnosticism* and *Atheism*. But there is another choice—the tradition of *Pantheism*, a philosophy which, in the Western world, is as old as Pythagoras and as contemporary as Albert Einstein. Its adherents over the centuries have included students of the Orient as well as the Occident. For me, this is the best and only solution to the "god problem." For a while the awkward term Pantheistic Humanism was employed as a label. But this combination of words annoyed some others, so I searched for another label. Fortunately, at this time Dr. Charles Francis Potter, founder of the First Humanist Church in New York City, published a book, *The Faiths that Men Live By*, in which he suggested the term *Cosmic Humanism* as a name for the religious views of Dr. Albert Einstein, especially as this is set forth in Einstein's famous essay on "Cosmic Religion" (later I shall quote from that volume). This term appealed to me so much that I adopted it as the title of a recent book. From now on I shall sail under the banner of a "Cosmic Humanism."

Also from this time on I shall avoid the use of the term "God," since historically the word has had so many and diverse connotations. As a substitute, I have employed the term "Cosmic Lens," when this seemed appropriate to the occasion. It is not necessary at this point to go into details concerning how this construct functions in the present system of philosophy. But for the rest of my life I am stuck with the Lens, and the Lens with me, and I shall be striving to figure out what the Cosmic Lens does, or ought to be doing, in this modernized Bruno-Spinoza-Einstein cosmology.

MAKING A UNIVERSE

In Pantheism, "God" is man's name for the Guiding Field or Cosmic Imagination by means of which undifferentiated energy is focused in nodal points in space-time, subsequently to evolve under the influence of guiding fields on higher levels.



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.

DIAGRAM I

At this point it is pertinent to observe that one function of the Cosmic Lens is to serve as the focusing agent for concentrating cosmic field energy into particles (see Diagram I). This reciprocity

maintains the balance between energy and matter in the cosmos and provides for the interconvertibility of the two, in accordance with Einstein's equation for the equivalence of matter and energy. I feel quite certain that Einstein would agree with the pantheistic viewpoint herein set forth; indeed, in a letter he wrote me that "your view is very close to my own." But there are new components that have been added since Einstein's death, and these could be more controversial.

In any form of pantheism there can be—perhaps must be—local teleology or purpose in nature, especially on the human level of social purposes and goals, even though the infinite and eternal cosmos has no origin in time, no limits in space, and no cosmic purpose in being. There is no explanation of *why* there is a cosmos, even though this or that local galaxy does have an origin and end in time. But there is no "First Cause" in a temporal sense. Like it or not, the universe is here and one must accept it—as Margaret Fuller finally decided.

Before leaving the general characterizations of our subject—a new world religion—it should be reiterated that this world view calls for a transformation of human nature, a psychological revolution. With the coming of a new and different culture there will come also another basis for human relationships, resulting from, and in, a wider and deeper consciousness, such as Maurice Bucke described vaguely as *Cosmic Consciousness*. Faint anticipations of this wider awareness are foreshadowed in the *Samadhi* and *Satori* of Oriental mysticism, no less than in the *unio mystica* of Western culture—all these being illustrations of what Dr. Gardner Murphy terms man-cosmos resonance. The "cosmic man" of the future will have wider compassion and awareness.

Obviously we have now escalated to the highest level of our conceptual scaffolding, so let us now examine more carefully the broad architectonics of Cosmic Humanism as a religion.

XII. THE RELIGION OF COSMIC HUMANISM

We have repeatedly urged that from the standpoint of a Cosmic Humanism "God" cannot be conceived as a being or process apart from the human being and the social cyclodrama. A Pantheistic Humanism seeks to encompass an understanding of all that has been called "God" and "nature," and in that respect strives to provide a bridge to span the gap between "religion" and "science."

The radical feature of this coming world religion is that all the great religious figures are then divinely human, since it is man's

divinity that insures man's *humanity*. This means—as Martin Buber has put it—that "holiness comes to rest in humanity among men." For this reason Cosmic Humanism can become an appropriate mental and social archetype under which a new world religion can come into being. It provides a framework within which the varied symbolisms and scriptures of the world could be transcended. Such a universal religion should be accepted as serving to reveal and fulfill some deep psychological insights. But each of the traditional religions, even though it provided insights in its own time and place, must also strive to rise above its ancient dogmas and view itself as but one expression of the psychological principles of human aspirations toward cosmic goals that are unifying in their upward thrust.

In the next century, it will be necessary, if man is ever to create a dynamically meaningful world, to fabricate a planetary symbolism with its own natural "grammar." These global symbols for earth-circling communication media will, like public time and other gestalten, be transposable across the social whole. One finds antecedents for these, since through all natural forms—cosmic, biological, and psychological—there are common and universal morphogenetic patterns or guiding fields, such as Pythagoras, Plato, Kepler, and Jung posited. Their penetrating insights should spur us on.

Having thus, at this point, succumbed to the eloquence of my own importunings, I am impelled to offer the following suggestions for further research.

1) *Archetypes.* In the first place, one wonders whether the archetypes of Carl Jung, previously mentioned, which supposedly are buried in the "collective unconscious," may not provide the formative matrix for the emerging new world of symbols. If these "insight symbols" are really "there," might one not construct the superposed *neotypes* of the planetary language on the basis of the *archetypes* already resident in the depths of the human psyche?

2) *Kinesics.* A new field of research has opened up under the label of *Kinesics*. This field appears to be the study of bodily movements as they reflect the cultural patterns of the societies in which human beings live. According to Dr. William S. Condon,[2] bodily movements have a pattern that corresponds to speech patterns, so that in a sense the body dances to the rhythm of speech. Brain waves as measured by an electroencephalogram are synchronized with speech.

One thought that arises here is that we may have a suggestion concerning communication between peoples *via* a world-wide choreography. What kind of dance or/and sign language of bodily "talking" could be projected is a matter to be investigated. Hopefully the international dance mimesis would not be the Watusi or the frug,

unless these frenzied gyrations are the precursors of something more meaningful, still to come. Like the dance of the bees as studied by von Frisch, these contortions seem to suffer from what, in another connection, is termed "conceptual impoverishment." Every little movement may have a meaning of its own, but if you don't have a full repertoire of movements, you don't have much meaning.

Along these same lines, one of the interesting ideas advanced fifty years ago was embodied in the suggestion of Charles Fillmore when he predicted that hearing and seeing can develop in every cell of the body, independently of ears and eyes. This, if true, would harmonize with Dr. Condon's thesis that the body dances to the rhythm of speech. But on the cellular level there would needs be a "master conductor" who would keep the members of the "chorus" in rhythm and guide the melodic progression. Once more we move in the direction of Maurice Bucke's "cosmic consciousness."[3]

Perhaps—to speculate still further—the choreographic performance of a "planetary kinesics" could somehow be combined with the "picture-writing symbols" (Semantography) of Charles Bliss to create the novel art-form that might induce the "total experience" of those who, at their own risk, are now seeking the deeper, wider awareness through resorting to psychedelic or hallucinogenic drugs. Eventually all these experiments in consciousness expansion bring me back to my favorite theme of the musical cosmologists, namely, the theory of a universal language based on the musical-mathematical approach of the Pythagoreans, ancient and modern. "Spherical music" is the term I have proposed to designate the research and findings in this field, some part of which is reported in the book, *Cosmic Humanism,* with more to come in the next chapter.

3) *Astraglossa.* Another line of exploration that is even now being opened up is the research program for a language to communicate with intelligent beings—if any—on other planets of our solar system or other systems in our galaxy. This is the problem of communication in its widest context.

In connection with the topic of cosmic communication with intelligent beings on or from extra-terrestrial civilizations, we have already noted that the Dutch mathematician, Hans Freudenthal, has published a volume in which he propounds such a language. The title of the book is *Lincos: Design for a Language of Cosmic Communication* (1962), and the name of the cosmic language is *Lincos.* Along the same lines, Lancelot Hogben, in a lecture on "Astraglossa," or "First Steps in Celestial Syntax," proposes that numbers could be used as pulses to convey signals—*radioglyphs*!

These programs remind one somewhat of Leibniz's project for a

universal language (a *Characteristica Universalis*) for the expression of ideas. Supplemented by a calculus of reasoning *(Calculus Ratiocinator)*, Leibniz held that it should be possible to anticipate all possible knowledge. If one believes in the creative power of electronic computers, one could indeed not only anticipate all future thoughts of all human beings, but one could also, with those same computers, compose poems, music and even philosophy. Scientists then would have made mankind superfluous!

But then, in that day, the men who have made themselves superfluous on this planet will betake themselves and their computers off into space—"out there"—to other stellar (solar) systems, and in time make the intelligent creatures of the celestial civilizations of other systems similarly superfluous. This would be an extension of the nihilism of Existentialism to cosmic proportions. Perhaps something of this type of horrendous fear animated Norbert Wiener in the writing of his last book, *God and Golem*. Here we have displayed the analogies between cybernetics and the creative activity of the Deity, suggestive of the titanic powers of the automaton who through a colossal feed-back recursively creates the universe—after entering into a compact with Satan. *Black magic redivivus—most frightening*!

These side excursions into *Kinesics*, *Spherical Harmonics*, *Planetary Semantics*, *Cosmic Symbolism*, *Satanic Cybernetics*, and the like, should not be allowed to divert our attention from the main object of this study. The burden of this chapter is still that of establishing the doctrine that mankind here and now, on this planet earth, is ready for ushering in a new world religion, a world view which could properly be described as a Cosmic Humanism. This coming religion will not be perfected by any one person; it cannot be the private property of any group. It should be the emergent outcome of the profound psychosocial stirrings and wholistic aspirations of all mankind. As such, it must strive to focus the visions of the seers and prophets of the ages into the meaning and purpose of life. History and vision are here fused.

As we look backward in time, we see that as societies have gradually moved up from one plateau to the next, men have outgrown archaic forms through the recognition of larger perspectives. Thus in the arc of time's trajectory the obsolete forms of religious expression have progressively been transcended. The ideal vanishing point represents the culmination of a great spiral of human evolution, beginning with the most primitive forms of animism and moving upward in natural sweeps of growth toward the pinnacle of the coming transfiguration of mankind.

As far as I can see, this religion is not so very different from that proposed by Sir Julian Huxley under the term, *Evolutionary*

Humanism. As Sir Julian has pointed out, those aspects of human experience which are usually described as *divine* did not originally imply the existence of the gods. This surely means that this "religious raw material"—as Huxley terms it—is destined to remain, even while the infantile conceptions of the gods invented by men to explain this material have disappeared.

One great virtue of this approach is that it seeks out and promises a unification of the psychological and social roles of all great ethical geniuses—from Ikhnaton, Moses, Lao-Tzu, Buddha, Jesus, Mohammed, Spinoza, to Aurobindo—not to mention whatever other unknown ethical geniuses the human family may produce in the future.

The centuries that lie ahead for man are open and uncertain. The tasks we all face in unifying mankind are complex and difficult. But the challenge is there and cannot be ignored. Perhaps man's very existence as a symbol using and communicating creature is now at stake. But if and when *Project Prometheus-Krishna* (or some facsimile thereof) is available to the world, we will then have the facilities for broadcasting the "Voice of World Science," and later, perhaps, the "Voice of World Religion." Such are the possibilities of global communications systems by way of satellites.[4]

Clearly we are now back to our main theme: the elaboration of a "coming world civilization"—under whatever name—will call for new media of communication to express man's expanding experiences and horizons of thought and feeling. Here is where a creative semantics will find its unique opportunity to invent wholistic symbol systems for a world language. Only in this fashion can man free himself from unreal, inadequate, and outmoded frames of reference. My guess is that a "Planetary Democracy" and a "Cosmic Humanism" will develop and emerge together—or they will not come at all.

NOTES AND REFERENCES

1. See the volume, *Language: An Inquiry Into its Meaning and Function;* edited by Ruth Nanda Anschen; New York, 1957.
2. See the summary article, Body Dances to Speech," *Science Newsletter,* June 18, 1966, p. 483.
3. Interest in the innovative ideas of Dr. R. M. Bucke, founder of psychiatry in Canada and friend of Walt Whitman, is growing. At McGill University in Montreal the Dr. R. M. Bucke Memorial Society has been founded, largely as a result of the efforts of Dr. Raymond Prince of the Medical School at McGill University. This society publishes a *Newsletter Review.* There is an excellent article on Dr. Bucke by Cyril Greenland in *Canada's Mental Health,* May, 1963 (Vol. XI).
4. For a further development of these ideas, see my article, "One World Global Communication Satellites," *Humanist,* Fall, 1967.

3

The Grand Strategy of Evolution

We consider bibles and religions divine—I do not say they are not divine;
I say they have grown out of you, and may grow out of you still;
It is not they who give life—it is you who give the life;
Leaves are not more shed from the trees, or trees from the earth, than they are shed from you.

Walt Whitman

I. WHY A "COSMIC HUMANISM"?

THE PHILOSOPHER Friedrich Nietzsche proclaimed that man is a bridge—a transition from the ape to that which is to come after—the Superman. Certainly man as we know him today is on his way out. He will not survive in his present psychological form. Mankind will be replaced by a "new humanity"—either that or man will sink back into the ancient seas from which all life emerged several billion years ago. But it is still possible that intelligently guided psychosocial evolution can bring the emergence of a creature higher than man. This is the aim of a cosmic humanism—to supply the drive for the integration of all knowledge toward that end.

The cosmology of a cosmic humanism would weld into one world-view the pantheism of the Stoics as this was further developed by Giordano Bruno, Spinoza, and others, and given poetic expression by such writers as Goethe, Emerson, Thoreau, Whitman, and contemporary scientists like Albert Einstein—a noble ancestry as all will agree. Beyond that, it also makes contact with certain forms of Oriental religions and philosophy and that surely must be regarded as a virtue.

Briefly stated, this world-view asserts that the cosmos extends without limits in space and time and matter. The unbegotten cosmos is infinite and eternal. It did not have a beginning in an enormous explosion. Pantheism does not posit an original "ball" or "sun-atom," created out of nothing. Hydrogen atoms—or their elementary constituents—are continually being created out of the infinite and eternal field of energy. For a simple statement, matter, so-called, could be regarded as "crystals" in a super-concentrated field of electromagnetic energy, the galaxies and stars converting the magnetic "liquid" into "crystals" when the super-liquid or plasma is "knotted" into singularities such as "protons," "electrons," and other particles, which are drawn together by gravity into suns (or driven together by the pressure of light from the other stars) to form the larger "knots" of "matter." This is one half of a cycle of energy-matter interconversions. It proceeds on the basis of the energy interchange with particles by the ratio c^2.

From Einstein's famous equation we know that matter—which is visible in principle, if not in fact—can be created from invisible field energy and can dissolve back into the ocean of energy. The elementary bits of matter of our earth, sun, and all the galaxies, are not formless. To form these amazing atoms (themselves complex solar systems) the force of a Supreme Imagination is required. We here introduce the image of a "Cosmic Lens," which like all lenses concentrates and focuses waves of energy at all levels of the ladder of material organizations. Thus the Cosmic Imagination (organizing fields of energy as *guiding agencies*) forms molecules, crystals, cells, many-celled organisms, up to man himself.

Should our planet be destroyed someday, its matter would melt into the invisible universe of energy and be recreated elsewhere. Hence the name cyclic-creative cosmology. But if mankind does not destroy the habitat, planet earth, is there hope that still higher forms of life will be created? Yes, if the theory of emergent evolution is correct. In fact, we ourselves are witnessing the suffering and the labor pains connected with the birthing of a new world organism, a world creature yet-to-be.

The escape from the imminent destruction of mankind in all likelihood will come—if it comes at all—as a result of man's heroic efforts, nothing less than what Pitirim Sorokin called the "reconstruction of humanity." Among those who have faced up to the problem in a constructive spirit were H. G. Wells (in his earlier years) and, more recently, Pere Teilhard de Chardin. Also the present writer has had a go at it. My own "World Sensorium," I would guess, lies about 3 miles east of Teilhard's spiritualized *Noosphere* and 2 miles to the west of Wells's *World Brain.* That is to say, the World

Sensorium concept contains elements of Teilhard's spiritual synthesis and Wells's secular formulation, though it seems closer to Wells's approach.

If we succeed in our effort at placing the World Sensorium within the framework of a Cosmic Humanism, the picture of the "world cogitatorium" will emerge as the biological organ of synthesis destined to bring to a head two billion years of earth history. More than that, the entire solar system will appear as a collaborating agency, and this in turn may involve the planetary configurations, the "solar winds," possibly even the dynamics of the entire Milky Way galaxy. But to "bring to a head" the course of human evolution, we must cephalize the Sensorium as the functioning vehicle for the expression of the genius of mankind, pulsing through the guiding fields of human institutions and endeavors.

If the language here seems to slip into the foggy realms of fantasy, it must be kept in mind that we are exploring a domain where we have few contacts with old familiar landmarks. Perhaps some will intimate that we are generating nothing more than what has been called "a pink mist, a blue print, and a rosy glow." But it certainly is obvious that mankind does require new concepts and symbols and an imaginary map of the coming territory. Conceptual integration of idea-systems for progressive human evolution—that is the radical transformation of understanding and attitude we here envisage as the goal of the "new earth and the new humanity."

Of course, when it comes to language and its effectiveness, it is obvious that old words have lost their meanings and powers. Already we see the drift toward a semantic suicide in which in time no one will listen to anyone and effective communication will have vanished. In that day, in the absence of a creative semantics, life will degenerate to its lowest common denominators of group existence—the howling of monkeys, the barking of dogs, and the whimperings of helpless animals.

Even natural scientists, notoriously devoid of philosophical training, are now aware of the language problem. It is now fashionable for them to show familiarity with Michael Polanyi's book *Personal Knowledge*, which is concerned with an old epistemological problem of how to get from private worlds to an objective reality by way of interpersonal communication. This problem is as old as Socrates; and the remedy Plato prescribed—the creative semantics of the *Republic*—is still the best remedy available. But the data and principles for the modern synthesis must be provided by contemporary science and not by the science and metaphysics of Aristotle.

In the development of a philosophy of cosmic humanism we shall

require a vocabulary that is partially novel, in which the "world sensorium" is but one of several new terms. Our words are at best a groping toward a language that will enlarge our understanding. But once we realize that there is a continuity of intelligence and spirit in the human scene, and that these are a part of a planetary way of life, we will have approaches that are liberating.

It should be made clear, however, that the "planetary democracy" we project as a part of a "cosmic humanism" should not be the formulation of any one person. There must not be any messianic delusion behind a philosophy with the sweep of a cosmic world-picture. The synthesis here envisioned can come into being only as the emergent outcome of the thoughts and creative efforts of the great human adventure. As such, it must be in resonance with the best rhythms of all forward-looking cultures. To this increasingly wide and deep pool of human wisdom all individuals in all countries are encouraged to contribute.

Once this global mindedness is accepted by the interthinking peoples of the earth, the much-talked about "brotherhood of man" will come naturally and it will overshadow the old dogmas of wealth, caste, race, religion, and other divisive particularisms. Fortunately there is an increasing number of seers, sages, and prophets carrying their burning sconces in the convergent march of humanity toward the creation of the World Sensorium as the organ of planetary synthesis. These seers reveal themselves in a hugely dramatic setting. Riding along in the seminal surge of morphogenetic energy, they spearhead the drive of man toward a cosmic humanism—the orchestration of man's achievements into a head-heart synthesis wherein the sciences, the arts, and the religions of the world are taken up into a planetary philosophy. Such is the vision.

II. THE HUNGER FOR WHOLINESS

The distinguished philosopher, Dr. Philipp Frank, has said that the longing for the integration of knowledge is deeply rooted in the human mind. One wonders, is this true? The program of Cosmic Humanism adopts this proposition as a working hypothesis and hopes the evidence will confirm it. Time will tell.

By *integration* in the present context is meant the subjective act of bringing together the inner potencies of the individual and the available resources of the environment into an original functioning organization of beliefs and behaviors that a) maintains itself as a steady state ("dynamic equilibrium"), and 6) that persists through newly emerging states. If we use Kurt Lewin's formula, "Behavior is

a function of Person and Environment," we note that each of these is very complex. It is this complexity that creates difficulties for us humans, as psychiatrists well know, for they are constantly confronted with cases of personality disintegration—failure to maintain the integrative unity of the self. Health and evolution, personal and social, are dependent upon integration, the maintenance of the unity of the organism.

If one adopts the cosmic perspective—from the alpha to omega, from microcosm to the macrocosm—we become aware of the integration of energies and guiding fields as basic to formal coherence at any given level of complexity. Everything is waves, waves of energies, and if we knew enough, we could, as Dr. Andrija Puharich says, write the equations and the score for the symphony of wave patterns that course through man from the lowest level of the spin and precession of electrons within him to the waves that originate in super-galactic systems.

But if integration is an inescapable feature of the cosmogonic, chemical, and biological levels, it is even more a necessity on the psychological and social levels. Here it is a moral imperative. The personal subjective aspect has been stressed by the late Dr. J. Robert Oppenheimer. Dr. Arthur Moor informs me of a discussion with the "father of the atom bomb" in which Oppenheimer stated that

> synthesis is not to be found in any central corridors of thought, but in people. We live in a world of multiple connections. Almost anything can be related to almost anything else, but the fusion takes place in the person.

This is true, but only part of the story. What it is that is to be reflected on and fused is in turn related to what kind of world we now want to create.

As others have pointed out, energies on the human level become noetic, so that information and misinformation need to be sorted out. This requires a double cybernetics of intra-subjective and interpersonal feed-backs so that input information comes out as wisdom for both personal decisions and social programs and courses of action. If there had been more of that when (and before) the Manhattan Project was carried through, we would not have had the dilemma of "that damned bomb" as Oppenheimer himself called it—after the termination of the war and the failure to secure international control of atomic energy developments.

A succession of dynamic equilibria and a forward movement in time are necessary, and these require an "openness to experience" and "closure of knowledge gaps" which make the growth of wisdom a possibility. Here again a balance of knowledge and action are desirable.

III. IS IT A RELIGION OR A PHILOSOPHY?

A question is raised: does Cosmic Humanism aspire to the role of a new world religion? This obviously is a matter of how one uses his terms. In the preceding chapter we urged that, in "creative semantics," one is free to change the traditional meanings (connotations), provided one knows what he is doing and can give good reasons for departures. This certainly has good sanction in the field of religion. If we agree with Paul Tillich that religion is man's "ultimate concern for life, the ground of existence itself," then this includes sex, culture, vocation—either that, as Tillich insists, or religion is nothing. This view is congenial with my own attitudes. Thus conceived, religion and philosophy are very close (as in Oriental culture), and Cosmic Humanism could in time become a new religion. In that case—as Tillich would agree—men no longer can solve their political, economic, racial, and religious conflicts until science and religion are also harmonized and united in their devotion to an understanding of life's meaning and problems.

In the past the mystical religions have held out the promise of an enlightening relationship or *ecstasis*—the mystical union with god. In a cosmic humanism we learn that since the living cell's development and movements reflect cosmic lines of force, there is a kind of silent covenant with the Supreme Imagination, affirmed unwittingly by every normal cell in the human body. Thus we human *DNAs* of the emerging World Sensorium have an urge to grow from the *latent image* in the Cosmic Lens into the *developed object* of the Supreme Imagination. Man is the advanced tip of a spiral which grows toward and into the Cosmic Imagination.

As already indicated, Cosmic Humanism is a modernized version of the tradition of Pythagoras, the Stoics, Giordano Bruno, Spinoza, and Einstein—to mention only a few Western thinkers. But the present view has affinities with the Oriental tradition as expressed in philosophical Hinduism, Zen Buddhism, and Lao-Tzu's Taoism. If this turns out to be a viable integration of ideas, we have the beginnings of one level of East-West synthesis. Such a general ideology could provide a plateau of understanding for Oriental and Occidental civilizations.

It is our thesis that such a development grows out of, and is urged on by, a study of cosmic, biological, and psychosocial evolution. To show that this is so, one needs only to recapitulate the story, especially as it is observable in the realm of biological evolution.

Any perceptive human being who contemplates the mathematical engineering marvels of the organs of a flower, of a bird, or the organs of a human infant, must surmise that something more than senseless

chance is needed to compose these wonders. A Power of Creative Imagination must be at work in the building of every living creature. And this is indeed what Cosmic Humanism proclaims untiringly. Against the doctrine of chaotic chance evolution the cyclic creative cosmology presents the case for the formative field of a Supreme Imagination at work. This is the ultimate basis of the "hunger for wholiness."

In a slow and painstaking manner we humans are gradually learning of one of the most momentous events in the history of our earth: the decision of a number of living molecules to form a cooperative, the one-celled ameba. Later on, more cells formed higher cooperatives until in the higher animals we find the cells assuming various specialized functions in order to make their complex cooperative a going concern. Accordingly, some cells built and operated the central pumping station, the heart, while others formed the eyes, the ears, the lungs, the intestines, and so on. Thus the community prospered. The most important task in vertebrates fell to those cells that formed themselves into the central switchboard, the brain, in order to direct by electromagnetic impulses—going over miles of electric wires in the human—the activities of the whole community which is the living creature.

From Unicellular to Multicellular Organisms

The story of the transition from protozoa to metazoa—from unicellular to multicellular organisms—has been recounted in my book, *The Integration of Human Knowledge* (pp. 393-396). This is one of nature's great transitions. It is important to note that our own body is a vast community of cells, almost a planet in itself. Indeed, there are many more millions of cells in our body than there are humans on earth. And what we do not realize is that millions of cells in our body have the freedom to go as they please. They travel freely with the blood stream and the lymph stream. These leucocytes and lymphocytes are like amebas, one-cell creatures in themselves for whom our own body is the "earth" they inhabit. But they are not vagabonds. In going through all parts of our body they perform their social tasks as rescue squads, ambulancemen, repairers and rebuilders of damaged parts. There are other species too, plant-like and animal-like creatures, viruses and bacilli, some of them of utmost importance to the health of the whole community; while others are intruders and a direct threat to the community. In short, our own body is in itself a whole "earth," giving life and nourishment to many more millions of creatures than are on our planet as individual higher animals. Most important of all creatures in our body are the cells that form the brain, the neurons, the components of the electro-

magnetic switchboard, which direct all cells and all rescue and ambulance squads to every point of emergency.

Electric Integration and the Brain

Now let us imagine that our planet is itself a giant organism, a world creature. Then every single human being is a "cell" in this planetary creature. So are all other animals and plants. But what exactly is the place of the human race in this world creature? Three hundred years ago we wouldn't have known. But in the meantime man has invented the telegraph, the telephone, the radio transmitter, the television system. Man has spanned the whole earth with many millions of electric nerve wires, with cables and telephone lines and regional and global switchboards. What does this all mean?

It means that we human beings are the cells that are building the global central switchboard, the World Brain, of the new World Creature to be born. Already we are trying to use the same cosmic imagination which works in our own brain in our own body. When a finger gets hurt, its cells send a frantic telegram for help to the central switchboard in our brain. Immediately our brain sends out electric messages to various parts of the body, ordering the leucocytes to the scene, ordering the manufacturing of medicines, ordering rescue squads and ambulances to come to the help of their stricken brothers.

We, the human race, members of the World Brain, are already beginning to act in much the same way. Whenever an accident occurs on our earth involving the health and well-being of earth-creatures, be they human or animal or plant crops endangered by a flood, an epidemic, a volcanic eruption, a famine, the world organizations receive frantic electromagnetic messages for help. And by cables and telephones and radio we order rescue squads to the scenes, food, medicine, repair materials and men to help the stricken people, the stricken cattle and crops—all "cells" in the world creature. Similarly, we have come to realize that our well-being in America, or Europe, or elsewhere, can be assured only if we do everything we can to help our brother cells in stricken areas like India or Africa. All our strivings for a United Nations organization, a World Health organization, and the rest, are the visible influence of the Cosmic Guiding Field, which is already at work in the central nervous system of every creature on earth.

This is the greatest power on earth: creative cooperation of electrons, atoms, molecules, cells, and creatures of higher harmony in cooperation. Men have called this power by various names—*God, Jehovah, Logos, Ahura Mazda, Tao, Allah,* or *Cosmic Imagination.* We can see this guiding energy working in the flowering of a rose, the

flight of a bird, the logic and love and care which higher animals display toward their children and members of their own species. What we humans must do is understand this Cosmic Power and act in harmony with it. We must see the fallacy of those Epimetheans who see only chaotic competition and who intensify rivalries between churches, states, races, and classes. Most of all, we need more inventive "cells" in the emerging World Sensorium.

In our own writings we have relentlessly proclaimed the idea of the human race as constituting the nerve cells (neuroblasts) of the new World Brain (World Sensorium). The intercommunication system, already beginning to function, will unify the earth organism into a well-integrated whole. This hypothesis is based on the idea that as social evolution progresses and becomes ever more intimately interwoven with the proliferating spiderwebs of telephony, radio, radar, television, and other media of communication, we are in fact building what we have termed the electromagnetic society. To complete the emergence, we shall require as a physical basis for world synthesis, a unified and world-wide symbolism or semantography for effective communications among humans via electrical systems. A global radio and television hook-up through communication satellites is the earthly basis for the coming psychic unity of mankind. This, at any rate, will be the case if our major concepts are sound.

IV. THE MAJOR CONCEPTS

We now come to the more difficult task of explaining Cosmic Humanism in terms of the substantive content of this world-view.

The first matter to be dealt with has to do with the relation of God to nature. As a pantheist, the Cosmic Humanist repudiates some popular notions that are still wide-spread. In this area there are three main viewpoints which we can use as markers. In the Western world the three prevailing conceptions of the relation of God to nature and man are: 1) *Theism;* 2) *Atheism;* and 3) *Pantheism.* I shall here discuss Theism and Pantheism, and mention Atheism only briefly, not because it is not important, but because there is not that much time on this occasion. An Atheist states that *there is no definition of the word "god" according to which it would be meaningful and true to say that "god exists!"* This certainly seems dogmatic to many of us. For one thing, so much depends on your definition of "God." I shall try to avoid the problem by refraining from using the word; instead I shall refer to the "Cosmic Imagination." For the moment, I leave it at that, mentioning, however, that some of my best friends

are atheists. Many Humanists are Atheists. Sir Julian Huxley is (or was) an Atheist, though he has been in trouble with his fellow Humanists because he has used the term, "the divine."

The first viewpoint, *Theism,* is familiar to us of the Western world in the Judaeo-Christian tradition as set forth in the *Old* and the *New Testament.* In this monotheistic religion God is the Creator of the universe who instituted the laws of nature; also, He can interfere with them at will to work miracles and special providences, as He sees fit, in answer to prayers and supplications. This form of supernaturalism involves also the belief in revealed religion, i.e. the Bible is the inspired word of God ("verbal inspiration of the Scriptures").

Contrary to the view of Theism, Pantheism affirms that the universe is unbegotten and uncreated; it has always existed and will always be here. With Spinoza, the Pantheist holds that the cosmos is eternal in time and infinite in space. Particles of matter (in the modern version) may emerge from the infinite ocean of energy and return to this ocean. This is possible because of the interconvertibility of matter and energy, in accordance with Einstein's famous equation ($E = mc^2$). This is brought out in my Diagram I.

According to Pantheism, there is no "First cause"—a Creator who made the universe, 4004 B.C. according to Bishop Ussher, or 5 billion years ago, according to Abbé LeMaître. (The time scale of astronomy is constantly being enlarged, and some astrophysicists now say that our own Milky Way galaxy is approximately 15 billion years old. But this is one local galaxy and not the entire cosmos, which, I believe, is infinite in time and space.)

According to Pantheism, no one knows *why* there is a universe (in this context I prefer the term *cosmos*). No one ever has been able to explain why there is a universe, and no one ever will be able to explain why the universe exists. This seems like dogmatism, but really isn't. The question of "why" there is a universe is a meaningless question. The cosmos is, and we must accept it—like it or not.

But in our everlasting cosmos "creation" is going on all the time—creation not as making "something out of nothing," but as making "matter" out of a preexistent energy (the first would be a miracle; the second is perfectly natural). The Cosmic Imagination is creating matter (universes), here and there, throughout infinite space, and the death of one universe makes possible the birth of another universe. This creation of matter is in the form of hydrogen atoms (or their components), and hydrogen is the "mother stuff of universes," as one astronomer put it. In using this term "Cosmic Imagination," I am, I hope, referring to a natural and non-anthropomorphic reality. "Imagination" in the physical world—and as I use it—will also be employed in the psychological context, and is defined thus:

Imagination is that organization, a factor in nature in virtue of which parts are put together in their right time and places to make products. It operates in the physical, biological, psychological, and social levels of reality. Another name for it is the *organizing field of energy.*

Now let me summarize some of the more important postulates of a Cosmic Humanism, in the following form.

1) Behind our perceived universe of material things in space and time there is a *Cosmic Field of Energy,* infinite, eternal, uncreated, and indestructible. Within this universal ocean of energy there is a Cosmic Imagination which, by way of the *Cosmic Lens,* acts as a focusing and guiding field of influence in controlling the creation and evolution of matter. Thus, high above the local gods of the earth's regional religions, there is a Divinity, an immanent guiding field, maintaining a balance between the visible or *manifest* world and the invisible or *unmanifest* world, and the reciprocity conforms to Einstein's equation for the equivalence of matter and energy, $E = mc^2$. This guiding influence organizes matter into the forms of evolution, from atoms to human beings—and beyond.

2) Since God is not a personality distinct from nature, the alleged "miracles" and "special providences" of supernaturalistic religions do not and cannot occur. Therefore, there are no "revealed" religions and the doctrine of the verbal inspiration of scripture has no foundation in fact. The Supreme Imagination appears as an invisible field of influence permeating the visible physical universe, but since this impersonal and divine influence can never in man's thoughts be any greater than man's capacity to envisage, man will become more like the Divine influence as he increasingly understands and reverences the infinite and everlasting cosmos in which all things live and move and have their being (to employ a Stoic phrase which Christianity borrowed).

This also implies that there is no unique "sacred" literature; and "sin" as a violation of the "laws of God" as revealed to some prophet is sheer superstition. The clergy have no private contacts with supernatural powers, and they have no special status as the interpreters of God's will.

3) The chemical elements in living organisms and in the human body have been cycled through the interiors of stars as they have undergone the processes of stellar evolution. Conversely, atomic and molecular behaviors are manifestations of cosmic laws and principles.

One is tempted to propose that this also implies that the movements of the living cell during division (mitosis) resonate cosmic field patterns, creating DNA-RNA resonance of force-fields which sustain

the potentialities resident in living organisms. However that may be, the Cosmic Imagination as here defined is implicit in the gene and does help to control the embryological development of living organisms.

4) In a panpsychistic and pantheistic cosmology human consciousness is a manifestation of organizing (guiding) fields of energy, so that *even atoms have souls*, i.e., integrated unities maintained by energy fields. The soul life of atoms and molecules is of a low order, but all natural integrates are perfused with subjective feelings.

Life, mind, and consciousness are manifestations of the force-fields that are posited as the basis for sentience. This means that life and consciousness are neither accidents nor miracles in the world; they are built into the basic structure of the cosmos, just as much as gravity and inertia are natural and pervasive realities of nature. In a real sense, therefore, the living cell is an affirmation of a silent covenant with the Cosmic Imagination.

5) As evolution—or what Whitehead termed the "creative advance of nature"—proceeds up the ladder of emergence, from the simplest organizations, such as hydrogen atoms, to the later and more complex levels, consciousness increases in richness of content and intensity of inner experience. Man, the latest product of evolution, is capable of the widest variety of experiences—intellectual and emotional—and his pleasures and sufferings are the most intense. He also has more conflicts and can more easily disintegrate. This is the price he must pay for his human soul.

6) The universality of spiral forms of matter and energy, from *atoms → galaxies → protoplasmic systems → cortico-thalamic circuits → higher psychic functions*—these are ingrained evidences of the inertial resistance of the already achieved integrations to the pressures of guiding fields of influence. But it still is true, in cosmology, that a harmonious order controls the guidance of emergence.

7) In the hierarchy frequency model it is postulated that the micro-rhythms are integrated into macro-rhythms. The frequency scales, arranged in octaves, are cycled somewhat like the second, minute, and hour hands of a clock. There is here the possibility of parallel induction interactions between levels of frequencies. It will be a momentous discovery when, and if, it is established by research that there are measurable relations between the rhythms and cycles of the cosmos, e.g., between the physical and the biological organizations, on the one hand, and the specifically human characteristics on the other.

What we are saying is that the principles of synthesis that interrelate the physical, the biological, and the psychological homomorphisms (similarities of relation-structures) are in terms of some sort of meshing of frequency levels which arise in the spiral of evolution. Here apparently the environing fields on the various levels which serve as the vehicles of interactions and synthesis can under certain conditions expand, as it were, *and draw the surrounding fields into resonance with themselves.* This is one key to the cosmic process. As some students urge, this "key" must be turned seven times to account for the levels of sequence of the rungs of the ladder of emergent evolution. For us, however, this is only another way of stating the thesis of the 8-dimensional topology of our cosmic humanism. This aspect of our multi-dimensional world-view has been developed in our book on that topic and does not need to be repeated here.

8) Human consciousness in its awareness and in its time-spanning purposes is man's most immediate experience of the cosmic guiding field as it functions on the level of organisms. The invisible Cosmic Imagination which guides the course of biological evolution through the "radiation belts of thought" *(Psychosphere)* is a non-moral force, it is neither "good" nor "bad," *until it reaches up into human consciousness to appear as integrated personality, at which point the Cosmic Imagination manifests moral attributes.* If there are other universes—planetary systems with living, conscious, and time-spanning creatures—inhabiting them, there, too, problems of moral choice will arise. But here on the earth man alone is the bearer of that god-like quality of creative imagination which is the precondition for moral conduct. Cosmic Imagination is personified in man in the *Inner Messiah.*

9) The next hypothesis in the system of Cosmic Humanism constitutes another speculative venture. We have already indicated that the dramatic focus of mankind's present challenge is the opportunity to participate in the proliferation of an organic world mind, a giant earth-creature, in which each individual functions as a germinal cell or neuroblast which is destined to be integrated into a planetary nervous system. This world cortex as a concept provides a bridge between the secular notion of a "World Brain," as presented by H. G. Wells, and the idea of the Noosphere as a spiritual entity in the evolutionary philosophy of Teilhard de Chardin.

10) In our hypothesis the earth is an organism in its embryonic stages, with a great composite mind still to emerge. For decades our suggestion has been that the Eastern and Western hemispheres of the globe are two halves of a revolving earth-armature, spinning out the lines of force (wires) of the brain lobes of the electromagnetic

society. These two, the left and right cerebral lobes of the world Sensorium, have their planetary electroencephalographic lines of force. *The original precursor for this make-and-break alternating current flow of electromagnetism is provided by the geomagnetic reversals of the earth's polarity.*[1] It is known that the geomagnetic dynamo has a frequency in its alterations of field strengths, on the average of 20 fluctuations in intensity between successive polarity reversals. The dipole field reversals also have a remarkably uniform rate, passing through the zero point, the timing being in part controlled by processes occurring in the fluid core of the earth.

Then, much later and on a higher level, this view of the electromagnetic world brain receives additional confirmation in the way in which telegraphy, radio, radar, television, and the like, in their functioning resemble the afferent and efferent fibers which secure organismic integration and world unity in our electromagnetic society.

These foregoing means and media of communciation are the prototypes of extra-sensory modes of communication, which are parapsychology's flickering and fitful anticipations of things to come. In this connection we may recall, as Dr. Gardner Murphy once pointed out, that two minds in telepathic reciprocity can act as one mind, in which case the porous boundaries between two individual event-systems may dissolve. If this be so, we must accept this as a datum, even though present-day physics and psychology are unable to describe the nature of the one-ness and interflow between two supposedly separate systems.

In this scheme we individual human beings constitute the embryonic nerve-cells of the developing earth-creatures. When it is matured, the World Sensorium will function like the lobes of a giant brain, with human beings integrated through reverberating circuits into a world mind. True, there is a dilemma here. We speak of the World Sensorium as something still to emerge, i.e., as not yet existent; but some will insist that there cannot be functioning neuroblasts or "electronic tubes" unless and until the organism has at least been born. In a sense, this resembles the chicken-egg problem: which comes first? In addition, there is another problem.

Some Ethical Aspects

One of the persistent problems of guided social evolution is, and will be, how to achieve a balance between freedom and order, among groups and individuals who have different temperaments and ambitions and are at different levels of intellectual and spiritual development? How do we reconcile the desire for personal freedom with the deep drive toward a cosmic plan and guiding field? The best

answer perhaps is to note that the relation is somewhat analogous to the role of individual notes and chords of music in the overall progress of a symphonic composition. One is not compelled to participate in the playing of, or listening to, a symphony orchestra; but if one wants to make music, or listen to it, voluntary cooperation on the part of many is called for. Later on, and on a grand planetary scale, I shall expound the doctrine of "spherical music"—a recent addition to the orchestration of ideas of a Cosmic Humanism.

The last point brings up the possibility of building a world government through planetary federation. This operation will require the services of the World Sensorium. In the world federation there will be no built-in conflicts between existing nations; and the organ of world government must be able to function with the authority and the conscience of mankind. All this poses a tremendous challenge to education, through all media of communication, including the *Project Prometheus-Krishna,* to help build the coming planetary civilization.

V. THE GLOBAL COGITATORIUM

We have urged that the pressing need of our time is for moral perception and social action based on well-conceived philosophical foundations. Such a synoptic social vision is humanly orientated. But the hunger for wholiness expresses the thrust of a cosmic archetypal influence which provides the formative energies of human evolution. Thus our Cosmic Humanism is rooted in the conviction that we are living in an evolving but integrating universe, and this it is that justifies the program of the integration of knowledge concerning the cosmos from top to bottom. While taking care to shun theological personifications, we favor the conception of divinity as the power to create, to originate, to grow into new freedoms. The dynamic process of growth is the "essence" of man and the surge of cosmic fields.

With each passing decade it is becoming increasingly clear that contemporary scientific knowledge provides support for the hypothesis of an immanent spiritual factor in the cosmos, and this is expressed in and through invisible fields of force, that is, nonmaterial guiding influences with exemplifications on the physical, biological, psychic, and social levels.

It was Dr. C. Hilton Rice who first persuaded me to look upon the entire earth as a giant living creature, and the evolution of living forms as a part of the embryology of this planetary organism. This idea was eloquently presented to me in a series of letters by Dr. Rice, whose untimely death (in 1937) prevented the publication of his

projected volume, *The Visible Organism.* I preserved some of Dr. Rice's letters in my own book, *The World Sensorium* (1946).

Dr. Rice envisaged the whole system of life in its developmental processes on the plan of the egg and the chick. The earth-organism, the world-mother, nourishes its embryo from the materials of the earth-egg. He saw the plant and animal divisions of the earth-organism as being in functional complementarity, precisely like the two layers of the gastrula.

The metaphor, "tree of life," for a while had provided the scientists with a useful analogy, but it has now become inadequate as an explanation of the "meaning" of evolution. In line with this, we agreed to the substitution of "gastrula" for "tree," so that—as indicated—the plant and animal kingdoms then are regarded as the ectoderm and the entoderm of the giant organism, while the human race is then the differentiating fore-brain of the creature in which our individual human nervous systems become the "neuroblasts," the embryonic nerve cells. These "neurons" are not yet the perfect cells they will later prove to be—but for that we must wait.

If the world is to be an organism, it must have a body-mind for appropriate discriminations. Among these functions will be the ability to see, not in the accepted sense, and not limited by the laws of physical optics, but an ability to perceive—perhaps as though there were a psychic eye looking through a psychic ether, seeing everything, everywhere, in the space and time of our planet. Vision in man is splitting into sensory and extra-sensory response units for the discrimination of sensory and extra-sensory stimuli. The evolutionary changes that are bringing this about do not appear in the size or weight of the brain, but in the morphology or/and electro-chemistry of the neurons. The external appearance of the cerebral cortex with its "electronic tubes" bears no obvious relation to the mutational changes in the neurons. When the process is further along, we may set up the following analogy:

Individual Cells : *Brain* : : *Human Brain* : *World Sensorium.*

Certainly there are puzzling things about this homomorphism. Just what happens in the individual's consciousness when he enters into "mystical union" with the World Sensorium? According to Dr. Beatrice Bruteau, when the individual is in samadhi (or has the "peak experience" that Abraham Maslow discusses), the brain is at rest, in the sense that the alpha rhythm does not register; but the entire mind (including all levels of the unconscious) is engaged in only one idea, so that all its usual functions are harmonized and integrated (or in Warren McCulloch's terms, all the nerve nets are connected in one great circuit), and there is no internal conflict or blockage.

In working out the mechanisms and the consequences of this idea, we have proposed that if man can muster the energy and the social imagination to envision the coming social organism and bring it into being, history will be salvaged from the dark domain of disintegration and death. Clearly we need a neotype to guide the social embryology of the earth creature. To achieve this, two things are required:

1) There must be a crystal clear intellectual recognition of, and profound emotional devotion to, the proposition that total planning for a global civilization is necessary.

2) There must be evolved scientific techniques for this overall integration, and practical educational programs for the clarification of the goals and the demonstration of how to attain them. In my own thinking it is impossible to separate these two desiderata.

As we have reiterated, human society can be compared to the differentiating forebrain of an evolving organism. Insofar as this is a useful concept, we must agree that at the present time our human world is a low grade organism: it is an acephalous affair, segmented like a worm, with no brain and no efficient organization of the body as a whole. Accordingly, if society is to "get ahead," it must become a high-level organism and acquire a brain and organs for coordinating its vast multiplicity of presently uncoordinated activities. *It seems clear that the time has come to take the step from social segmentation to political-spiritual cephalization.* This is one of the fundamental propositions of an evolutionary humanism. It points to the need for the birth, growth, and cephalization of a world psychosomatic creature—an organism-to-be.

A high-grade organism has not only a nervous system—it also has a mind. And if we are to have a world organism with a world brain, we humans must also give it a world mind. On the social level, this would be but another name for the planetary civilization in action, and the philosophy of this planetary civilization will be a cosmic humanism functioning through the lives and thoughts and feelings of mankind.

As part of this picture, we have visualized Eastern religions and Western sciences and technologies as two complementary lobes of the planetary brain-mind functioning, i.e., two halves of the earth-armature which in its rotating develops the powerful currents that supply light, warmth, and energy for the evolving world creature. The dramatic focus of our immediate position is the present opportunity to participate in the next development, that of the world cortex and mind in which each individual serves as a conscious germinal cell in the proliferation of the planetary nervous system.

The idea of a world cortex requires something more than the notion of a "cultural sensorium," as a kind of "socio-psychological unconscious," by analogy with the individual unconscious. This idea may have its merits. In such an analogy myths and religions serve the same function for a culture that reveries and dreams do for the individual. This leads to the interesting conclusion that a higher state of consciousness, and the possibility of a world harmony, await an insight into the unconscious processes which in the past gave cultures their directions. But the new forces can no longer be unconscious or irrational, though they may be non-rational in the sense of including emotive and affective drives.

In working out the details of the homomorphism, we are forced to use the human body as an "image." Just as there are "brain waves" from the cerebral hemispheres, so there are "planetary encephalograms." Nevertheless, the understanding of the relation between the conscious processes in the mind and the electrochemical processes in the brain is still to be sought, in spite of all we know about the rise and fall of electrical potentials of the brain waves. The evidence here is accumulating,[2] and this is all grist for the mill.

The one theorizer who did so much for cybernetics in the early stages was Dr. Warren S. McCulloch. He it was who elaborated the hypothesis that brain waves constitute a tonic background for over-scanning, i.e., that the alpha rhythm sweep of bioelectric potentials up and down through the cortex was a scanning mechanism for the recognition of *forms,* a crucial problem for gestalt theory. In an important paper by McCulloch and Pitts,[3] we have a statement of how a *scanning mechanism* in the cortex could furnish the basis for the recognition of gestalten as patterns of stimuli. The idea here is that a rhythmic sweep of negativity up and down through the cortex—the *alpha rhythm* of the E.E.G.—performs a temporal scanning of the cortex, "which thereby gains, at the cost of time, the equivalent of another spatial dimension." In connection with this phenomenon of the intertranslatability of the spatial and temporal patterns, one thinks also of the investigations of Riggs and Ratcliff,[4] indicating that visual acuity is enlarged ten to twenty times beyond the limits set by the mosaic structure of the eye by a tremor effect. That is to say, we see here again a pattern of nerve impulses in which there is a trading of time for space.

The evidence indicating that reverberating circuits of activity involve conduction between the thalamus (possibly also the hypothalamus) and the cortex, and back again, was given added support by the work of Bishop and Bartley,[5] and further strengthened by the investigations of Duser De Barenne and McCulloch,[6] all of whom have supposed that the alpha rhythm

depends upon circular feed-back resonant activity between the cortex and the thalamus. For us the significant thing is the manner in which these developments support our notion of consciousness as an emergent field pattern and also confirm our idea of what we have long called *cortico-thalamic integration* ("the head-heart synthesis"). Also the notion of the intertranslatability of spatial and temporal patterns in scanning is important since it certainly seems to support my long-standing idea of emergence and the isomorphism of an n and an $n + 1$ dimensionality as this was first expounded in my book, *Philosophy and the Concepts of Modern Science* (1935), where the concept of "Consciousness as a New Dimension" was set forth. I have returned to this idea from time to time.

If the force patterns which *are* consciousness are the isomorphic wave-patterns in the sub-ether or *Psi*-field, then mind and matter are joined in close harmony in the living body. If so, we seem to be closer to the goal of understanding how mental patterns impose their own guiding fields upon neural configurations and thereby activate the subordinate molecular fields and other mechanisms of behavior. Accordingly, the macroscopic field of consciousness lives to influence its biological basis through the electromagnetic bond of fealty which unites mind and body. The chronaxic resonance of cortical action patterns implies a pace-maker device somewhere in the nervous system. For present purposes, however, it is not essential to localize the master clocking device which orders the forward movement of the melody which is the one-way life of consciousness.

If our hypothesis is sound, a similar clocking device for the earth's evolutionary scheme is also required. This I have proposed as part of "cosmecology," i.e., that the entire solar system serves as the pace-maker for evolution. This in turn reminds us of our postulate of a feed-back resonance between the human nervous system and a psychic radiation belt around the earth. The World Sensorium has its planetary brain waves moving over the surface of the globe, and the migrations of peoples and the rise and fall of cultures are like electric signs playing over a bank of lights.

These radiation belts supply the drive and the morphological archetypes of evolution, those already embodied then providing the "jumping off" places for the new species in the succession of earth eras. This means that the "thought-belts" of the planetary cortex control the proliferations of the *DNA-RNA* protein chains which form the helical configurations of biological evolution on this planet. This is immanent teleology on a vast scale.

But what is the empirical evidence for the validity of such high-level—stratospheric—ventures in thought? To answer this question, it is necessary to deal with two further matters: a) we need to discuss

the nature of the role of radiation belts, physical and psychical; and b) to recapitulate the findings which are embodied in the concept of the "Pulsing Ionosphere." This excursion will take us into the domain of what is now known as "plasma physics."

VI. PLASMA PHYSICS AND THE *PSI*-FIELD

To get a clearer picture of our vision of reality, we must develop the latent image in our mental photography laboratory. Much work remains to be done. The functions and structures of the earth's various onion skins of the geophysical, biological, and psycho-social layers as the preparatory stages for the proliferation of the World Sensorium—all this must be clarified. Somehow the "themes" of the interlocking global "movements" must be orchestrated into a closely woven and progressive harmony, the grand finale of which is still to be written by man himself, the music master.

In trying to place the movements of the symphony in proper sequence, some experimental repetition of themes is inescapable. Among such recurring themes is that of the role of "plasma physics." We have made no secret of the fact that we hope to find the key to an explanation of the functioning of the World Sensorium in the postulated *Psi*-layer that surrounds the earth and in which the general phenomena of super-light phase wave speeds are possible. In general, a *plasma* or highly ionized gas is a medium in which waves may have a phase velocity greater than *c*, the speed of light *in vacuo*. The increase in velocity of transmission is a measure of the density of the ionized medium. Such media are described as *superdispersive*.[7] The literature dealing with this topic is growing.

There is nothing sacrosanct about the velocity of light. In a vacuum it still is constant—186,300 miles per second approximately—as relativity theory requires. In his book, *An Evaluation of Relativity Theory* (Falcon Wing Press, 1953), Dr. Charles A. Muses states that the fact of the constancy of the velocity of light is not a mysterious principle, but a simple consequence of the fact of wave motion, namely, a moving source may change the frequency and wave length of a wave, but the product of the two, the velocity, must remain constant *for a given isotropic homogeneous medium* (p. 4).

No doubt it is true that, until recently, physicists were mostly concerned with the velocity of light as it was dealt with in relativity theory. So when in 1934 P. A. Cherenkov reported the production of visible radiation where electrons traveled at velocities greater than that of light, this came as a bit of a surprise. Of course, this was no contradiction, since the circumstances here do not conform to relativity theory requirements, i.e., *light in vacuo*.

Superlight Velocities

In Cherenkov radiation the light is not emitted spherically but conically, and its index depends upon the index of refraction of the medium. Here the "singing electrons," as they were called, which produce the light waves that exceed the light velocity of relativity theory, are in a situation comparable to the airplane or bullet approaching the "sound barrier." In such cases we are dealing with media with increasingly high resistance of the medium to projectiles approaching the wave-speed for that medium. If the charged particles in the electromagnetic field travel at a speed greater than that for light (as in Cherenkov radiation), there is an apparent increase in mass of the particles and a head-pressure in the medium, comparable to shock wave effects, builds up. The mathematics for supersonic and superlight velocities is the same. It is simply that Cherenkov cones are shock-wave cones and emphasize the importance of the physical medium in which the waves are propagated.

Nevertheless, this is important philosophically, since it shows that many phenomena now appear "understandable" which, on older views, could not be brought within the scope of what was reasonable to man. Accordingly, I am emboldened to revive the earlier sub-ether to serve as the medium for the "transmission" of thought influences outside the central nervous systems of organisms, since this type of extrapolation now finds some support in plasma physics. This is a superb example of how our minds may be freed from slavery to outmoded forms of thought.

The traditional philosophy of nature was inherently dualistic. Among the many dualities set up was the "bifurcation" of "matter" or "particles" and "empty space," the *void,* which later became the medium for the transmission of light "waves." This inadequate dualism was first enunciated in Western thought in ancient Greek atomism.

Until recently, it was assumed that the space between particles, between gross bodies, between planets, between stars, between galaxies, was empty, except for the non-material gravitational and electromagnetic fields that envelop all bodies in space. Today it is clear that this supposed dualism of matter and space is false and misleading. Now we know that interstellar space contains atomic hydrogen (both "hot" and "cold"), and that this space, while not occupied by solids or liquids, is permeated by a fourth state, *plasma,* or electrified gas consisting for the most part of atoms of hydrogen stripped of covering electrons. This interplanetary and interstellar plasma is a kind of fluid and may be responsible for the slowing down of the earth's rotation on its axis. The electrical sea may extend to the fringe of the sun's atmosphere and be the medium for

solar system influences which wash the earth's outer envelope and environment. Nicholas Christofilos (in the ARGUS experiment) managed to create an electrical sea (plasma) 300 miles above the earth's surface by exploding a hydrogen bomb. This belt, like the natural (Van Allen) layers revealed by the earth's artificial satellites, is held in place by the curving lines of the earth's magnetic field.

The exact origin of the earth's magnetic field—as opposed to local eddies—is not known precisely; but a likely theory is that the earth's rotation produces the general symmetry of an overall field of electrical currents aligned along the axis of rotation. This "dynamo" theory would be in harmony with the astronomic model of magneto-hydrodynamic processes we have frequently mentioned. Here, again, we have the basis for a synthesis—a unification of the solar-system and cosmical dynamics.

Back to Singing Electrons

In connection with new possibilities of synthesis, we must emphasize once more the remarkable discoveries coming to the fore in connection with the study of superlight velocities technically referred to as Vavilov-Cherenkov radiation (after the discoverers).[8] As noted, Einstein's principle of the constancy of the velocity of light was overextended and so retarded the study of the interactions between light-energy moving particles in a refracting medium with its own macroscopic properties. Such phenomena have been nicknamed the radiation of light by "singing electrons." They are of special interest because of their connection with plasma physics, astro-physics, radio physics, and so on. The original investigations have since been extended to make contact with the magneto-hydrodynamics of Hannes Alfvén of Sweden *and now include the study of so-called magneto-acoustic waves of magnetic plasma,* i.e., plasma exposed to constant external magnetic fields, as we shall see later.

These and other discoveries lead one to suspect a non-linearity of the equation of light propagations through space and cause one to wonder whether we do in fact understand all the properties of radiation. Certainly we see now that light not only transmits information—brings us "news of the universe"—but also modifies the electric and magnetic potentialities of space in such a manner that no absolute border between field and matter can be defined.

It is now well established that the interplanetary space of our solar system is not empty. While it is not occupied with ordinary states of matter, such as solids and liquids, it is permeated by another state of matter, plasma or electrified gas. In brief, there are "rivers" and "oceans" of electrical fields which wash the material world of

galaxies, stars, planets, and everything in between. The Van Allen radiation belt is one such plasma, held in place by the curving lines of the earth's magnetic field. As already noted, some plasma phenomena have counterparts in the world of everyday experience, but certain other phenomena—such as superlight phenomena—are found only in the domain of plasma physics.

One phenomenon which ordinary physics and the physics of super-dispersive plasmas share is exhibited in the behavior of wave-trains having what are called *group waves* and *constituent waves*. The suggestion as developed in the *Integration* book (see *Index*) is that the "constituent waves" are waves in a sub-ether and these enter into the composition of "group waves" in such a fashion that the nodes of overlapping are responsible for the emergence of "particles." Moreover, there is an inverse relation between group waves and the constituent waves such that the product of the two—which is the velocity of light, as previously noted—is a constant of nature.

To repeat: the group waves are a result of superposed constituent waves. This was then related to de Broglie's "wave mechanics" wherein it becomes possible in this "undulatory theory of matter" to regard particles as manifestations of group waves accompanied by guiding waves (Schrödinger's *psi* waves) which travel faster than the particles and show them where to go. The distinction between the two foregoing kinds of waves, *group* (or *form*) waves and *constituent* waves, the velocities of their transmission, etc., have been discussed at length by Sir Joseph Thomson, and in my *Integration* book, where a long quotation from Sir Joseph's *Beyond the Electron* is reproduced to clarify the entire situation.

Waves and Waves

Whether the superlight velocity that runs in advance of matter can have any physical influences has been discussed. In the case of radio waves, these may have phase velocities greater than c, the speed of light *in vacuo*. It has been stated that the existence of long-range radio transmission depends in part on the fact that the radio waves of the ionized layers of the earth's upper atmosphere (the ionosphere) have phase velocities greater than the speed of light, and thus they are reflected back by the ionosphere. Thus this "fourth state of matter," when acting as a dispersive medium, has some properties which are peculiar to it, and these we suggest, may supply the basis for the functioning of our "planetary encephalograms." In this situation three qualifying circumstances must be kept in mind.

First, it must be remembered that while physicists refer to "wave guides," which somehow act like limiting membranes in conferring a kind of laminated structure on the plasma medium, *these "walls" in*

plasmas are not material—they are magnetic fields which coerce plasma waves into moving along lines of force. These lines are like "strings," and by analogy the magnetoplasma of our hypothecated *Psi*-field of the earth would perhaps function as the "wires" of our earth-armature, or even the "fibers" of the planetary ganglia and cortex.

Secondly, it must be kept in mind that our *Psi*-field (or Psychosphere) is not to be identified with any "ether" or "field" of traditional physics. Our *Psi*-field is above and beyond the 4-dimensional space-time universe of physics and astronomy. Our *Psi*-field resembles more the *quantum electrodynamic field* than any other aspect of current physics. But there still is a dimensional difference.

But in spite of the differences between levels or dimensionalities, we postulate that there can be a synchronicity or resonance, some give and take, between the lower manifest and upper unmanifest universes. The *Psi*-influences of parapsychology (ESP, clairvoyance, etc.) though not subject to the familiar limitations of space on our globe, may still be "earth-bound" in the sense that these influences do not spread into "outer space" or extra-terrestrial confines. About this, however, we have no information.

Thirdly, we should make the point that it is advisable that we rephrase our previous statement in earlier writings that the higher dimensional realities of our 8-dimensional universe *emerge* in an evolutionary sequence from the lower 4-dimensional world of physics. What emerges are the "phenomena"; but the dimensions are everlastingly present in this infinite and eternal cosmos. To repeat: what emerges from the unmanifest into the manifest realms are the various phenomena on different levels, not the dimensions themselves. But before we attempt to relate these considerations to the elusive World Sensorium, let us summarize these notions concerning the hyper-dimensional basis of the Sensorium.

The Hyper-dimensional Basis

1) As we have made clear, the cyclic-creative cosmology requires an 8-dimensional world: the 4-dimensional space-time matrix of relativity physics complemented by an invisible domain of the same number of dimensions (i.e., 4 x 2 = 8), thus giving a symmetry between the manifest and the unmanifest realms. These two realms constitute the duality of the "physical" and the "spiritual" world, each quite necessary to the other. The two sets of dimensions interpenetrate each other and mutually interact.

2) A harmonic order exercises a measure of guidance control over the emergent evolution of hierarchical forms. On the human level, by

mastering the laws of harmonic synthesis, man will utilize the power of resonant thought to help bring the World Sensorium into being.

3) Broadly stated, the function of the World Sensorium is to map out the direction of human evolution and provide the guiding field for psychosomatic evolution. This program does not imply a form of totalitarianism. The World Sensorium is an ultra-stable system, a behavioral synthesis, of individual consciousnesses and the *Psi*-field polarity and complementarity. Its creation will be a function of the coming Planetary Democracy.

VII. PLANETARY ENCEPHALOGRAMS

Up to this point what has been said about "planetary encephalograms" has been quite general. In a previous book, *The World Sensorium* (1946), this problem came up for consideration and much of what was stated there still seems valid. But more has since been unfolded, and this may help to strengthen the argument.

Data from new research reveals that there is some underlying interaction between physical parameters, such as the planetary configurations and the solar winds, the earth's field reversals and drifting continents, the globe's magnetoplasm, the diastolic-systolic movements of the radiation belts, and the *DNA* replications-mutations cycles, the psychobiological processes of the alpha rhythm of the human brain, and other interlocking phenomena. If beyond that, we can otherwise support the hypothesis of a planetary *Psi*-field (Psychosphere), it may be possible to discover and utilize a resonance or synchronicity of the *Psi*-belt and the neuroblasts of the World Sensorium, and this will play a role in the future evolution of human consciousness.

In Appendix VI of *Cosmic Humanism* ("The Pulsing Ionosphere"), there is presented a model of the "pulsing ionosphere," which supposedly can provide for such interactions. Mr. H. Prescott Sleeper, Jr., there called attention to the possibility that the alpha rhythm (or resting brain wave) frequency of 8 to 10 cycles per second is externally controlled by the resonance of ringing frequency of the ionosphere, with a wave length of about 25,000 miles, making it possible for radio waves to circle the earth 8 times in this interval (i.e., the same number as that of the brain wave frequency). This astonishing numerology, we noted, is supported by Dr. D. E. Beischer's research showing that in the absence of the earth's magnetic field (eliminated through an appropriate shielding device), the flicker frequency threshold, and hence the alpha rhythm frequency, drifts as much as 40% in two weeks. Given these causal

connections between the physical and the mental, all we need next is to establish a parallel synchronism between a higher planetary Psi-belt and the proliferating human neuroblasts of the Sensorium of the giant earth-organism.

We have frequently pointed out that a new theory of the nature of human consciousness is essential to an adequate theory of the history of mankind. The prevailing theories of history are based on horizontal and linear thinking—a two-dimensional theory of social causality. Contrary to the flatland theory of a point-to-point transmission of influences, we have pointed out that on all levels of the manifest universe, *it is impossible, beyond a certain stage, to give "points-at-instants" accounts of events at that level, so that one must substitute "states" or "configurations" as phenomenological patterns which extend over a multiplicity of mass-units-in-space-at-instants of time.* This is the basis of what we call gestalt causality and the existential basis for the principle of macroscopic rhythms as unified emergents from microscopic swirls of events. But we still are searching for a proper way to state the general principle covering the "building up of harmonics," i.e., a kind of Fourier's theorem about the compounding of simple waves (or/and rotations) into overall macroscopic rhythms. If this could be related to the principle of spirality in the ladder of emergent evolution as a function of the Cosmic Lens, I should be happy to see the Supreme Imagination do double duty. Given a sumptuous allowance of 8 dimensions, this may be possible.

When we project this type of thinking into the realm of the psyche, we arrive at a theory of the nature of human consciousness

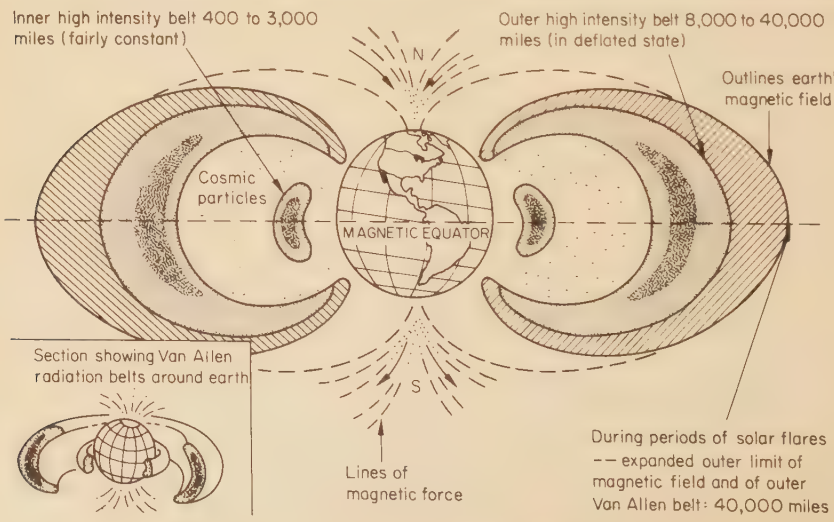


DIAGRAM II The Magnetosphere

quite different from the prevailing theory—we have called it the "inside the skull" theory—that consciousness is a function of the brain only. We have concluded that consciousness reflects a bipolar relationship, the human nervous system and the *Psi*-field which, we

The envelope of gases that surrounds the earth has within the last few years been revealed to be quite complex. In the heterosphere (above 55 miles) the gases are sharply divided into different layers.

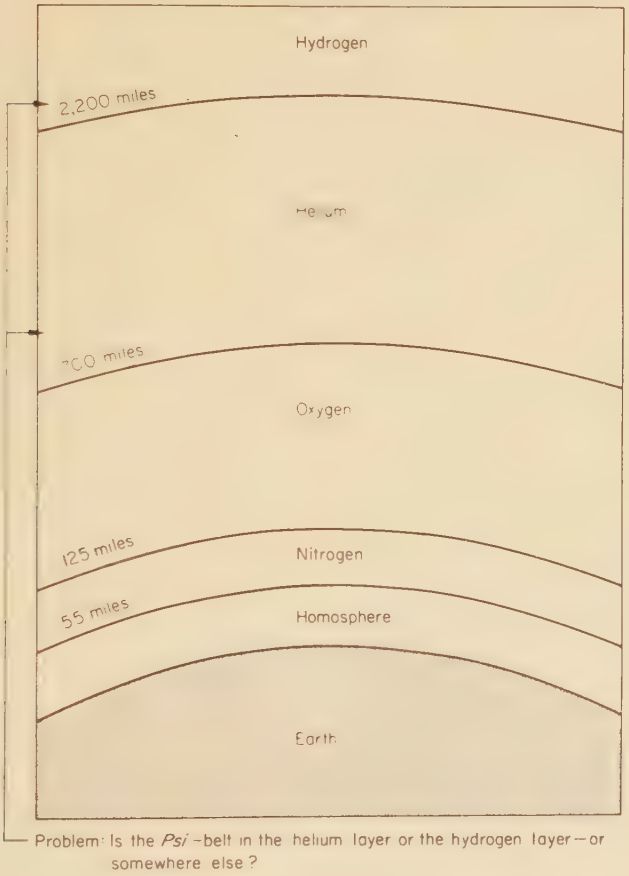


DIAGRAM III The Helium Layer

It has just been announced that "metallic hydrogen," believed to exist but never previously observed, may be a superconductor at elevated temperatures. (Would this be just the opposite of helium, which becomes a *superconductor* at low temperature liquid helium II?) And as surprising as the *superconductivity* of metallic hydrogen is *the possibility of electron-phonon coupling.*

In that case, it is possible that the hydrogen surrounding the earth (see diagram to the left) and outside the helium layer may serve as well as (or better than) helium as the medium for the *Psi*—layer of the Psychosphere which we seem to need in our bipolar theory of human consciousness. In that case, the "good earth" is even better than the moon-probing astronauts thought it to be.

postulate, surrounds the earth in a manner similar to, but not identical with, the Van Allen radiation belt (see Diagram II).

In thinking further about this, the idea emerges that the *Psi*-field may reside in (or be related to) the layer of helium that surrounds the earth in a broad belt. One reason for this hypothesis is that at low temperatures helium as a medium can transmit *both* longitudinal and transverse wave propagations. The importance of this will appear as we proceed.

Our Diagram III of the Helium Layer brings out the facts about the physical composition of the earth's environment and the place of helium in the series of layers surrounding our globe. Parenthetically, it may be noted that there is a layer of hydrogen outside the helium layer, and one wonders whether some sort of alchemy may not occur whereby hydrogen is converted into helium. When this occurs in the hydrogen bomb, enormous temperatures are required for the transmutation, but such enormous temperatures presumably are not available in the earth's outer environment. If such terrific temperatures did exist, this would seem to spoil the "liquid helium plasma" theory here being exploited. As between a "hot" or a "cold" outer environment, the latter seems much more probable.

Our hypothesis is that a Psychosphere, wherein a "cosmic consciousness" can occur, requires a field or plasma with unusual properties. Here we supposedly should find—if we are lucky in our guess—that the *sonorous ether,* and the *luminiferous ether* (the electromagnetic field for the transmission of light rays) are stages in a hierarchy of levels of fields. That is to say, they are lower level analogues of the higher field we have termed the *Psi-field*, or *Logos Field.* These relationships are represented in part (in *Cosmic Humanism*) in the following diagram:

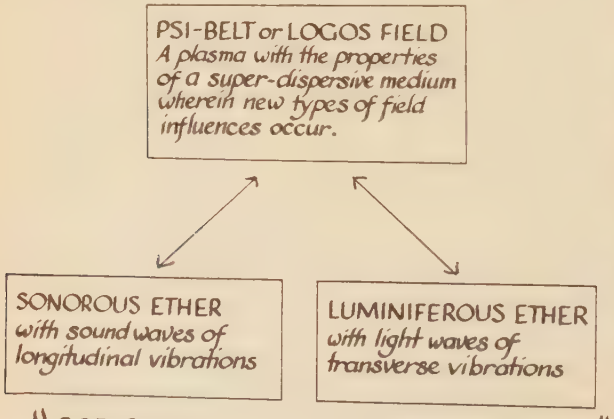


DIAGRAM IV Logos Field

Since resonance is both an acoustical phenomenon and one of electrical currents, there is a possibility of a synthesis of ideas. Resonance in alternating currents is discussed in *Essentials of Applied Physics,* by Royal M. Frye and Robert E. Hodgson, 1954, 283-4; and resonance in sound vibrations is dealt with in *The Physics of Music,* by Alexander Wood, 1962, 25-27.

For us an understanding of the interactions of the various levels of fields is imperative—crucial because we posit a "resonance" or "synchronicity" (the two are not exactly the same) between the various domains, such as the cortical-bioelectric, the mental, and the World Mind or Logos Field.

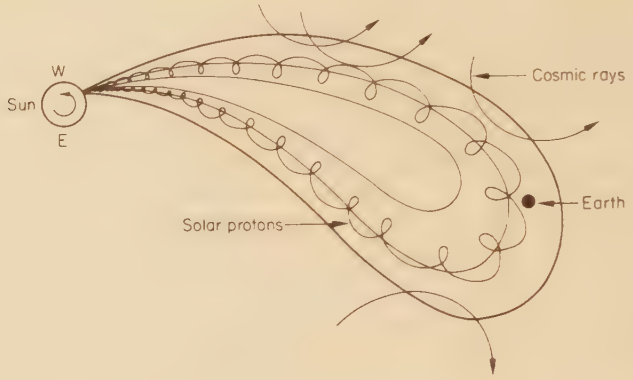
For us, however, the problem is more difficult because these various levels of fields require a hyper-dimensional basis—in truth, an 8-dimensional cosmos, if we are right. The theory behind this cannot be presented here; indeed, it has been partially developed in my book, *Cosmic Humanism.* In this volume we have tried to envisage the way to move up and down the ladder of dimensionalities e.g., from the 4 (3 + 1) dimensions of the manifest world of matter to the fifth dimension (and so on) of the next higher field—from the physical to the mental to the spiritual, and back again. The working out of a theory of levels, especially the "rounding of the curves of dimensionalities," is conceptually difficult; but when all this has been surveyed and understood, it will appear that we have an abundance of explanatory apparatus to deal with zodiacs, whether at Stonehenge, Glastonbury, or in the heavens above—the "effigies" in our galaxy (see the volume, *This Holyest Erthe,* forthcoming).

The Earth as an Electromagnetic Organism

The philosophy of history we have here barely outlined is quite unlike anything found in orthodox theories of history. Because of its unorthodox nature, we are under obligation to provide all possible aid in trying to make it intelligible. Obviously what we are seeking in this adventure into the meaning of history is a theory to provide an explanation for the social cycles that appear in the upward thrust in the spiral action of time. Such a theory must provide something like a *Psi*-field to serve as repository for the psychosocial records in which are preserved the forms or archetypes that periodically repeat themselves in human history—as for example, the "world's sixteen crucified saviors." These morphogenetic patterns are available in the unmanifest realm of planetary neotypes for social reincarnation at appropriate times and places on the earth's surface, where and when the geophysical and cultural configurations are favorable for rebirth. The scene for the psycho-social drama is frequently a stone-circle temple, a pyramid or tor, or a labyrinth. Here the mystery play can once more be enacted.

In the development of our theory, we originally employed the notion of two forces—*Yang* and *Yin* in the ancient Chinese cosmology. Now we suggest that one of these comes from the sun and the other from the earth, and between them we get something like a psychic analogy to the Van Allen radiation belt. In the case of the

physical analogue the belt is held around the globe by the earth's magnetism, but this "magnetoplasm" is ionized by the "solar wind" which comes from the sun. The original picture for this appeared in my *Cosmic Humanism,* and is reproduced below:



Propagation of solar disturbances from the sun to the earth

Now we propose a somewhat modified picture, which will be explained in a moment, though the diagram itself is as follows:

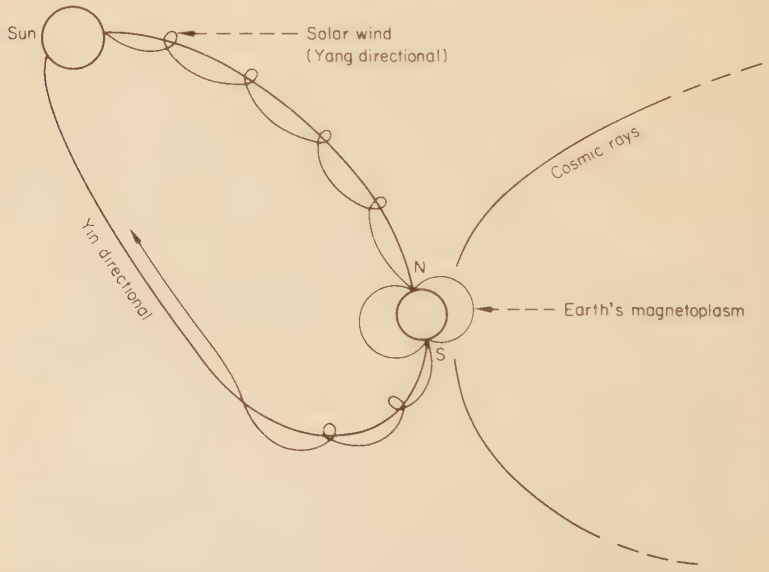
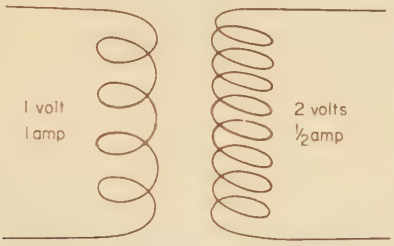


DIAGRAM V The Sun–Earth Hook-up

This provides the basis for an energy-couple where a resonance between a lower magnetoplasm and a higher and induced frequency supplies the physical analogue for a psycho-physical parallelism. Here the "brain waves" of the *World Sensorium* seem to be "emergents."

However, in order to explain the above diagram it is first advisable to refresh our knowledge of the principles of electromagnetic induction. At this point we are interested in transformers as these are dealt with in the physics of electromagnetism.

A transformer is a mechanism for receiving currents at a given tension and stepping it up for delivery at a higher voltage (or the reverse). This is accomplished by passing the electric current through a coil of a given number of turns and allowing a sympathetic current to be induced in a neighboring coil of a greater number of turns, as the following diagram brings out:



Primary and secondary coils

In our conception the earth's *Psi*-belt (or *World Sensorium*) is considered as such a device—it serves as the vehicle for the transformation of solar energy, coupled with a geocentric parameter.

Much of the earth is composed of iron, and this helps to create a magnetic field of concentric lines of force moving clockwise among the "wires" (lines of force), when viewed from the direction toward which the current is moving, i.e., the magnetic field rotates when the current moves forward.

My own latest conjecture now postulates that the electromagnetic impulses from the sun—it may be *via* the "solar wind," which ionizes the magnetoplasm surrounding the earth—go into the earth's sphere at the north pole and perhaps come out at the south pole, and the two currents will not be as they were originally pictured in my foregoing diagram as reproduced from *Cosmic Humanism*. In that case the Yang (male) comes from the sun and returns then to the sun as Yin (female). The role of the moon's influence, if any, is not clear, though the moon traditionally has been associated with the female sex. Here is the new picture of the couple:

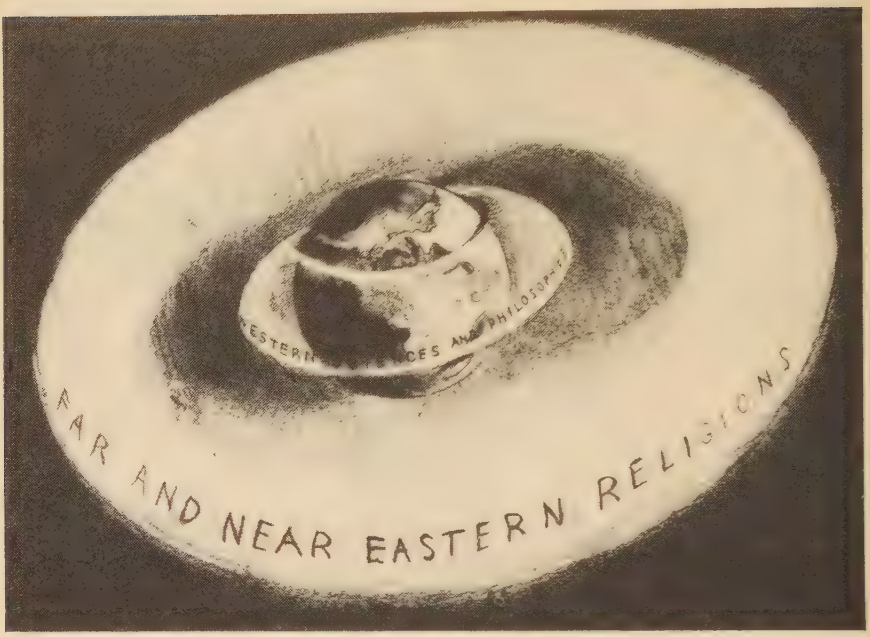


DIAGRAM VI The Radiation Belt of Thought

This gives us a basis for the energy-couple wherein a dualism between a lower and a higher strata provides the physical archemorph for the psychophysical parallelism. From this it should be possible to show how "magnetic" spots on the earth—such as Iona and Glastonbury—are chosen as the homes for the "reincarnations" of some earlier archetypal pattern, marking the place of convergence of the magnetism of the earth and the magnetism of the solar system.

This idea that the social incarnation on earth of a thought-field archetype requires two forces—a sun-driven or Yang force and an earth-driven or Yin force—has been suggested by at least two students, namely, Eduard Schuré and Esther Watson Tipple. In my article, "Building the World Sensorium" (*Loc. cit.*), we quoted from Schuré's volume, *From the Sphinx to Christ,* and here we noted that he proposed that two psychic currents "envelop the earth with their multiple rings like ever moving serpents of electricity." These respectively are termed centripetal and centrifugal forces by him.

Another student working along these lines is Esther Watson Tipple, and I beg leave to glance briefly at this collateral line of research. This brings us back to the Yang-Yin dualism. Mrs. Tipple's investigations culminate in the Yin-Yang music logarithmic spiral-as this is explained in detail in *Cosmic Humanism,* Chapter 8 (also pages

443 ff and 485 ff). The *Mercator slide rule*, based on the 53-tone music spiral, has its exemplifications in the microcosmic and the macrocosmic worlds. The yin-directional vector is female and the yang-directional thrust is male; however, they don't meet in head-on clash, but express complementary components in relation to the same natural facts. In the world of music the yang direction is that of the harmonic (overtone) series and the yin direction is the reversed numerical succession—both functionally integrated in the natural order of phenomena. I shall return to Mrs. Tipple's "spiral" later.

Our proposal has been, and still is, that in a similar fashion the sun-earth hook-up expresses the complementarity in our solar system cycle. In terms of man-made measures of time, the earth's rotation is yang or clockwise. When the ascending or earth-thrust yang-directional "tones" from "below" meet the "descending" yin-directional tones from "above," there is a harmonic-union creativity (similar to the approach of the points reached in the two geometrically represented successions of the musical spiral of the "perfect fifths" and "octaves"), and this consonance effect induces a creative synthesis *as though influenced by a cosmic electromagnetic field.* At such times and places on the earth's surface human history is lifted up into a new dimension—seemingly an archetype is "reincarnated" in social embryogenesis. Certain spots on earth, like Glastonbury, are definitely influenced by the idealistic type of thinking of the people who lived there. This has been described *as the ethos of a geographical area.* In the field of music this is recognized by some ethnomusicologists, as is pointed out by Mantle Hood in his volume, *Music the Unknown.* That this conception of a "spherical music" is not mere "poetic license" has been shown elsewhere in the article, "The Music Logarithmic Spiral and World Unity," by Esther Watson Tipple and the present writer, appearing in *Darshana International* (India), Vol. V, 1965, pp. 10-30. But this topic will come up at a later point.

To complete this "social embryology" of world history much work remains to be done. Among other things, it will be necessary to fortify the apparently fanciful analogy between the musical dissonance-to-consonance movement *via* the resolution of the chords of human history and the actual emergence of the planetary encephalographic patterns. This may perhaps be achieved by revealing the induction of resonance parallels between the *DNA* residing in the chromosomes of the cell's nucleus and the *RNA* residing in the cytoplasmic envelope which surrounds the cell, on the one hand, and the guiding influences of the earth-fields on the other. A somewhat similar analogy has been proposed by Preston Harold in his challenging volume, *The Shining Stranger* (pp. 106-109).

In our own vast parallelism the genes will correspond to the time-binding musical patterns that express the relatively monotonous vibrations functioning as "notes" or "letters" in the code of life (heredity). These "inherited traits" will then represent cyclic positions in the coil of life, i.e., the musical "notes" in the evolving configurations which constitute the double helix of the "yang" and "yin" as this helix participates in the global embryogenesis.

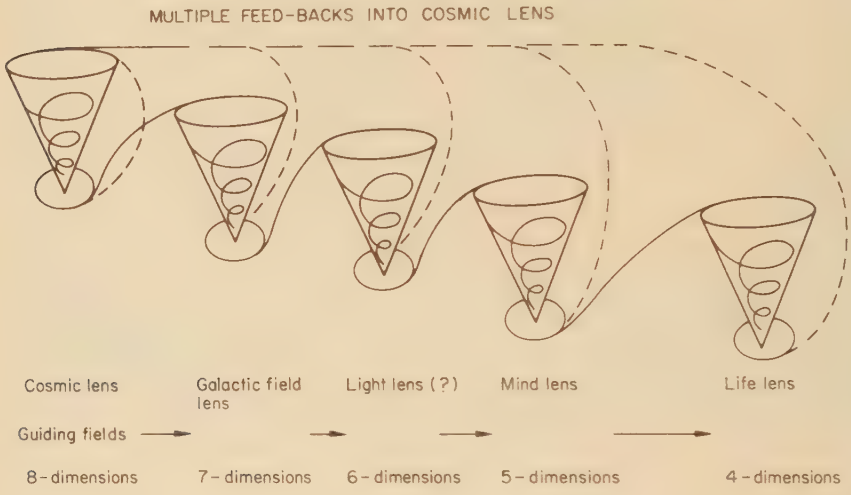


DIAGRAM VII

Instead of having one Lens of the Cosmic Imagination, perhaps we need several lenses, and these would come at the points where nature "rounds the curve of dimensionality," and steps up (or down) from one level to the next. In our 8-dimensional cosmology there must be a harmonic order that controls guidance and feed-backs. *ESP* (pre-cognition, telepathy, etc.) somehow fit into the picture as "resonance" or "synchronicity."

Phantom Currents and Magnetic Lenses

In connection with these matters one recalls the reports of the mysterious electric currents which continue to flow after the external excitation has been cut off—as, for example, the astonishing conductivity of lead when it is cooled to the temperature of liquid helium. Within a ring of such lead an electric current will course uninterrupted for two years after the current source has been cut off. Such "phantom currents," as they are called, belong in the category of the magnetic lens which appears in the super-conductivity phenomena taking place in cryogenics.

That magnetic lenses are possible is well established, though the principles involved are not well understood. Some while back general relativity theory taught that in the presence of matter space is

curved, and this space-curvature in itself constitutes a kind of lens-effect. Now we learn that galaxies can also act as lenses and that this may have some bearing on the observational results in astronomy.[9]

We cannot here follow up the implications of these ideas for cosmology and physics, whether celestial or terrestrial. In passing, however, it is pertinent to raise the question of how many lenses (or rather, types of lenses) there may be in our cosmos: is it possible that by a rather liberal definition of the term one might conclude that instead of there being but one Master Lens, the *Lens of the Cosmic Imagination,* there are several levels of lenses, as Diagram VII indicates? This must be answered—but not now.

Rounding the Curve of Dimensionalities

Let us return to our recurring problem of whether light and sound waves can coexist in the same medium. If the answer is in the affirmative, as we suppose, we need to face up to the question of whether we need a hyper-dimensional continuum for the kind of field we have postulated. And would this sustain any causal nexus with the helium layer as the superdispersive medium with its potentiality for superlight velocities?

If the answer is in the affirmative, another problem arises. Among the items of unfinished business in the task of perfecting the World Sensorium concept are the following questions: (1) how to work out the mathematics of *topological transformations* from level to level; and (2) how to *round the curve of dimensionalities,* as we ascend or descend the successive rungs of the ladder of the cosmological hierarchy.

With respect to (1), we know that in general various configurations in space and/or time can be isomorphic (one-one) or homomorphic (one-many or many-one), and that this similarity of structure is not necessarily obvious to superficial observation (on this see my book, *Integration*, p. 133).

With respect to problem (2), the difficulty is even greater. The problem here is to work out the homomorphic images between the various levels in orthogonal dimensions, i.e., at right angles to each other. This takes us into the domain of hyper-space thinking, beginning with the fourth dimension and rising to the higher dimensions. As Claude Bragdon points out in his essay in the Symposium, *The Fourth Dimension Simply Explained* (edited by H. P. Manning, 1960, p. 95), a rotation in 2-space takes place about a point; in 3-space about a line; and by analogy, a rotation in 4-space takes place about a plane. We see, therefore, that there is a greater freedom of motion in higher spaces. A good example of this is pointed out in *Cosmic Humanism* (p. 495), where the operation of

circumversion—turning a ball inside out—can be effected by movement through an $n + 1$ space. This gives us the needed principle for *rounding the curve of dimensionality* as we rise from 4-space to 5-space to 6-space to 7-space to the highest in our 8-dimensional cosmos.[10]

How the physical isomorphism of the various "images" in the various layers (dimensions) of the manifest-unmanifest cosmos is maintained—that is an unsolved problem. Admitting that in plasma physics there are superlight velocities in superdispersive media, it also remains true—as previously noted—that *at certain velocities we reach boundary conditions for given dimensions and the plasma media or fields in those dimensions act as wave-guides or walls to contain the phenomena in those layers (dimensions).* Perhaps it will be possible to work this out mathematically in terms of the discrepancies between group-waves and constituent waves. Once more, time will tell.

Finally, there is another problem that arises at this point: may the 8th dimensional influence ("guiding field") reach down, so to speak, and directly and causally influence a lower level sequence? That is to say, could the highest field intervene in a lower "psychic," or "biological," or "physical" layer, without going through the 7th, 6th, or 5th dimensions; or must one go from the higher—say the 7th—to the lower—say the 4th or ground level—as if one were in an elevator and thus had to pass through the intervening layers or dimensions? Here again I must confess that I simply do not know. Sufficient unto the day are the problems that already confront us. Perhaps a bit of modest restraint is appropriate. After all, do we need to crawl out on every limb of the tree of knowledge?

VIII. THE ROLE OF HELIUM

The search for the inner structure of the *World Sensorium* takes one into strange territories. At various places we have found ourselves snarled up in technical problems of geophysics, such as the origin of the earth's magnetic field and its periodic reversals. Now it seems necessary to explore the role of helium as a possible medium for the *Psi*-field or mental radiation belts.

The previous proposal that the *Psi*-layer may reside in the 700 mile helium belt that surrounds the earth (see Diagram VIII) will certainly seem like "far out" thinking. But the virtue of this layer for present purposes is that it may satisfy three requirements, as follows: (1) that we have at our disposal a superdispersive medium; and (2) that—as indicated—this superfluid or plasma be capable of

propagating two types of wave motions, namely, longitudinal and transverse wave trains, so that *sound* and *light* can be synergized into a "synaesthesia" in the World Sensorium; and (3) that other "strange" behaviors be manifested. Our job in the present section is to elaborate on these various requirements.

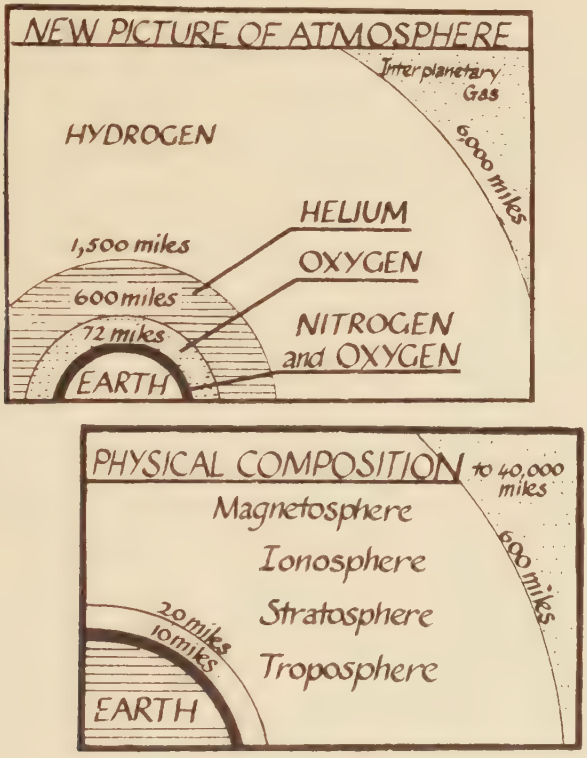


DIAGRAM VIII

THE EARTH AND ITS ENVIRONMENT

Parts of the new knowledge concerning the earth and its interior and exterior environments come from information which is supplied by the artificial satellites circling the earth. The discovery of a 600-mile layer of helium in the upper atmosphere illustrates this. Beyond the helium is a belt of hydrogen, after which comes the interplanetary gas, a plasma called the magnetosphere, and the Van Allen radiation belts.

First off, let us recall that helium, like certain other elements, when cooled to a temperature within a few degrees above absolute zero (4° above absolute zero for helium) will exhibit the phenomena of superconductivity, where all electrical resistance disappears and the electrons flow freely through space. Here strange behaviors do

indeed appear: lead, for example, becomes elastic and resonant, while helium creeps up out of a cup (its "container") in defiance of gravity. Most importantly, at this stage the thermal disorder that ordinarily occurs in accordance with the second law of thermodynamics disappears and the wave properties of matter prevail. As Mr. A. A. Cochran has noted, this seems to presage the phenomena and properties of *life* and *consciousness* as they appear on the later levels of evolution. Also at this point—as we must once more emphasize—the phonon interactions occur in which electrons in larger aggregates of solids and liquids emit or absorb waves that can, in the case of liquid helium, give rise to two different kinds of waves which are propagated at different velocities.[11]

It is interesting to note that these two types of oscillations, while proceeding at different velocities simultaneously, may pass through each other, apparently the longitudinal and transverse wave propagations both occurring together. The reasons these two unusual phenomena are possible is that in superfluids at low temperatures normal resistance vanishes.[12] This occurs in connection with the "phantom waves" in lead.

From all this it is clear that helium, the "sun element," is indeed a peculiar substance. But beyond the remarkable properties already mentioned, (the "phonon" phenomenon, etc.), the superfluid, liquid helium, *can also sustain vortex phenomena which result from the response of electrons to applied magnetic fields.*[13] How these vortices interact with one another, and with the super-currents, are questions the answers to which are currently being sought in low temperature physics laboratories.

While roaming about in all this unfamiliar territory, let us pause long enough to remind ourselves concerning the type of feed-back model we require to explain the synchronous responses (chronaxy) between individual human event-systems, which constitute the social milieu, and the Sensorium of the giant organism. As the reader will have noticed, what makes our problem unique is that we transfer analogies from sound and music to sight and vision, and conversely; but the fact is that one, *light*, is a transverse wave-train phenomenon in an *electromagnetic* field, whereas *sound* arises from a series of longitudinal vibrations in another medium, *air*. Of course, when the impulses from the outer world get into the cortex of the conscious human subject, they travel over nerves, optic and auditory, in the form of electrochemical nerve impulses, and these are experienced in the mind together and separately, and this "interpenetration" is another mystery in its own right. If there is a "cosmic consciousness" in the outer world (*Psi*-world) there must be a similar "interpenetration."

Accordingly, the language of the cinerama and the language of the symphony supposedly have not only a basic logico-mathematical substructure, but perhaps some common medium or field in common—a *sub-ether*?

Some Difficulties Transcended?

Seemingly there is no end to the difficulties we are creating for ourselves. There are three that stare us in the face. Two major difficulties our critics will come up with are as follows (1) it will be argued that the "earth's cerebral hemispheres" (the East and West "lobes") cannot in literal fact be two halves of a rotating earth armature; and (2) helium II cannot possibly function as a superfluid with the unique psychic powers that your cosmic humanism has assigned to it. There is a third difficulty I shall mention at a later stage. Let us say a word about each of these difficulties.

The most effective reply to the first criticism is to tighten the analogy to the point where the similarities between the earth-brain and the armature of a dynamo converge to an identity. This is not possible, but an approximation may be attempted. Even sober men of science are today finding their imaginations being stirred. In a recent article on "The Pulse of the Earth," John Lear[14] rhapsodizes: "The pulsebeat of planet Earth has not yet been counted. But the pulse is there. The rhythmic throbbing is the magnetic shell . . .", and so on. In my own version it has frequently been repeated that the two halves of the revolving earth-armature are spinning out the lines of force of the brain lobes of the developing electromagnetic society. The two—the left and right lobes of the World Sensorium—do in fact display something like planetary electroencephalograms, for the currents of the armatures of the earth, the Eastern and the Western hemispheres, show the make-and-break currents of electromagnetism as this is illustrated by the alternating geomagnetic reversals of the earth's polarities.

It is only now being revealed that the earth-dynamo has a frequency in its fluctuations in intensity between major successive polarity reversals (see Reference 1). This latter dipole field reversal also has a remarkably uniform rate as it passes through the zero point, the timing being controlled in part by processes occurring in the fluid core which, like any magnet, has a large portion of iron in its composition. Thus the organismic world dynamo grows in strength of appeal.

With respect to the role of helium, the point needs to be made that this is not essential to our theory, though some sort of polarity between brain and cosmos is required. The truth of the matter is that the concentration of helium around the earth is quite low, and the

temperature is high, and these are not the conditions that are favorable to a "superfluid."[15] There is an ionization of the gases around the earth ("photoionization" due to ultraviolet radiation from the sun), but apparently without all the conditions for a superlight velocity, etc., the ionosphere could serve just as well as the helium layer for the purposes we have in mind. In passing, we may note that the helium in the outer space environment is due to the radioactive decay from minerals in the crust of the earth, the atoms of which escape from the top of the atmosphere as rapidly as they are added to the bottom.

In general, however, much that is new in our knowledge does provide support for the concept of the earth as a living and breathing and diastolic-systolic electromagnetic organism with a dipole unity that bridges the gap between the iron core inside the earth and the magnetosphere far out in space, bound to the earth by the latter's magnetic field (see Diagram III). The web of life seems to fit into the picture of the geomagnetic dynamo as a vast network of transmission lines for the distribution of cosmic power—from atomic core to geodesic dome in the heavens.

Finally, to come to the third difficulty, some readers will ask the question: how is it possible for the helium belt 700 to 2,000 miles out in space to serve as one pole of the bipolar *Psi*-belt hook-up which is man's brain-mind unity, when we now see that astronauts can go to the moon, 240,000 miles off into space—far beyond the helium belt—while still retaining their individual consciousnesses? Where is man's dependence on *any* belt, when he can go beyond *all* belts?

In replying to these questions, we need to keep in mind that the Psychosphere is not so much an "onion skin" as an *enclosing field* which interpenetrates its own dimensional phenomena. The Psychosphere realm is at the top (or at least higher) in the hierarchy of media, in some orthogonal dimension at right angles to its own lower dimensional field. Of course, all dimensional continua are related to each other—the air-medium, the electromagnetic field, the plasma medium, the *Psi*-field, and so on up to the top. How homomorphic images are transmitted from field to field is a problem we have already dealt with. As already noted, the "rounding of the curves of dimensionality" is related to the fact that plasma media may act like wave-guides to form "walls" which contain the phenomena for that level; but when certain critical phase-wave velocities are reached the "boundary conditions" for that dimension are transcended and an entry into the next sphere-field is possible. In this sense the helium layer (or some other) plasma field may be essential to the existential functioning of the Psychosphere.

IX. THE *PSI*-FIELD AND RADIATION BELTS

Until recently there was little hope of making the foregoing ideas seem plausible. The idea of a *World Sensorium* would have been scoffed at. Perhaps the increasing vogue of Teilhard de Chardin's postulated Noosphere, especially when recast in the language of Sir Julian Huxley, has served to arouse interest in such thinking. Moreover, this form of "spherical thinking" as appears in my Sensorium concept has received encouraging support from collateral developments, such as, for example, in Mr. Sleeper's article on "The Pulsing Ionosphere"—even though we find difficulties in his theory.

Our problem is made more complicated by the supposition that influences from outer space somehow participate in this fertile union. Here an energy couple with synergy is operative. But what form does it take?

In an earlier article on "Building the World Sensorium," we examined one line of thinking in this area, that advanced by Eduard Schuré, and we still have this before us as containing suggestive possibilities. A somewhat similar type of world-view is set forth by Rodney Collins in his book, *The Theory of Celestial Influence* (1958), where Mr. Collins informs us (p. 122) that

> the magnetic current released by the death of living creatures flies to the lowest level of the ionosphere.

I don't understand how these "seers" come to know such things; but however that may be, the similarity between Schuré and Collins is striking, except that Schuré is invoking an electric streamer from the heavens (sky) above, whereas Collins is visualizing a "phantom wave" going out into space—to the ionosphere.

Curiously enough, *Iona* is also the name of a small island off the coast of Scotland, a Druid center to which St. Columba journeyed, there to found a Christian monastery, prior to his internment at Glastonbury. It seems quite fantastic to associate Schuré's "Iona" with a spot on the earth's surface (even when it is "magnetized"), but this is what is proposed by Mrs. Mary Caine. In addition, as I have pointed out in the book, *This Holyest Erthe,* Mrs. Caine employs this term as a name for a self-sacrificing god. As she puts it, "Iona is also essentially a doctrine of Divine inspiration entering the earth's atmosphere from outer space." This, of course, is entirely in keeping with Schuré's conjectures and—as will appear in a moment—also in harmony with our own inverted interpretation of Eleanor Merry's speculations.

Accordingly, while we are thus cruising around in the obscure realms of the esoteric and the occult, let us turn to Eleanor Merry's

notions. But before moving into that aspect which interests me most—her ideas on clairvoyance—let us glance at her general philosophy. This is expounded in her two books, *The Flaming Door* (London, 1962) and *Art: Its Occult Basis.* My exposition relies mainly upon the first-named book.

Eleanor Merry presents the thesis that ancient Celtic art gives profound insights into the nature of the world. For example, the spirals, circles, and lemniscates of the Druid stones are hieroglyphs for the living creative forces active in stellar and earthly worlds. With the Theosophists, she holds that the mysteries retained a knowledge of the connection between the rhythms of the cosmos and the human body. The Initiate experienced how man's etheric body mirrored the macro-cosmic evolutions. According to this view, the inner part of the earth-globe, into which the moon sends its influences, in turn acts like a mirror sending back into space a reflection of the cosmic rays. Thus the lunar and solar influences stream through the earth and are repeated in miniature in the processes of the body. Man is therefore placed between powers, i.e., those that work centrifugally, away from the earth, and powers that work centripetally, toward the earth's center. This idea, of course, is entirely in harmony with the "Horeb-Iona" idea of Schuré and Mrs. Mary Caine's conceptions.

Now let us pass to the application of these ideas to the search for the basis of clairvoyance. According to our savant, clairvoyant sight in ancient times was a universal faculty, which depended upon a

> peculiar vibratory relation between two parts of the brain whose functions, today, have become more or less atrophied as far as clairvoyance is concerned.

To the clairvoyant observer of the process, the effect seemed like a revolving form of "light seen from above the forehead." For my part, I would have to take this on faith, for the present anyway.

My own analogical reinterpretation, previously mentioned, is this: if a "peculiar vibratory relation between the two parts of the brain" is required for clairvoyance—and here I assume that Eleanor Merry means the right and left cerebral lobes, though conceivably this could refer to the "old" and the "new" brain—then, by analogy, the proliferation of the "World Sensorium" and its higher level consciousness would require the establishment of a similar synchronism or wholistic resonance between the Eastern and Western hemispheres of the earth—or perhaps the unity of the "two cultures" of the Orient and the Occident in the same unitary individual? Presumably, however, one could get the one only by also creating the other?

The physical basis for the original split was the separation of the

continents caused by the "drifting continents" (as Wegner asserted) which, on our theory, created the left and right hemispheres (earth -cortex-lobes) of the developing world organism.

Mystical notions aside, the scientific evidence for the "radiation belts" and "planetary electroencephalograms" is still rather meager—much of it tied in with speculations not yet confirmed. For example, in Mr. Sleeper's model it is assumed that the alpha rhythm frequency of 8 to 10 cycles per second is externally driven by the resonant or ringing frequency of the ionosphere, with a wave length of about 25,000 miles (giving the time required for radiation to circle the earth 8 times in this interval). One line of evidence for a correlation of the natural resonant frequency of the ionosphere and the human brain wave alpha frequency is said to be provided by some unpublished findings of W. A. Shafer of the Ryan Aeronautical Company. In a more general way the influence of diurnal changes in the earth's magnetic field and the incoming cosmic radiations on the circadian (daily) rhythms of simple living organisms has been studied by Dr. F. A. Brown, Jr., of Northwestern University; while, as previously noted, Dr. D. E. Beischer of the Pensacola School of Naval Aviation Medicine has shown that in the absence of the earth's magnetic field, the flicker fusion threshold frequency, and hence the alpha rhythm frequency, drifts 40% in two weeks.

All this, of course, supports the idea of a basic interaction between the ionosphere, the earth's magnetic field, and the alpha rhythm of the human cortex. Obviously, however, much further study is required to clarify these interrelationships.

If one were to adopt the "pulsing ionosphere" concept as the physical basis for the World Sensorium polarity, we might utilize the idea that a cortical frequency corresponding to a hundredth of a second could, in empty space, be nearly 2,000 miles long, and a wave length generated at 10 cycles per second would be 20,000 miles long—almost the distance around the earth. But whether such waves in the earth's ionosphere would provide the basis for the difference between the phase-wave and the group-wave duality that we seem to require to explain the sphericity of the propagation (bending back around the earth) is still a question.

If this theory were correct in principle, some emotional syntony between the radiation belt of consciousness and the human cortico-thalamic hook-up would seem to be required. This has been proposed by Dr. M. Lietaert Peerbolte and has been incorporated in my own bipolar theory of consciousness as a resonance or synchronicity between the outer belt and the human brain-mind. The only point at issue is—what is the "belt"?

Assuredly this is an interesting line of thought. But I still am

inclined to believe that the Psychosphere is something different from the "pulsing ionosphere." I suspect that the Sleeper-Peerbolte hypothesis is too simple; but it may well be a part of the total picture.

The World Sensorium and the Pulsing Psychosphere

Whether we have a dualism of two levels of energy exchange, or a trinity of three levels of fields, we in any case require communication loops between the higher-level *Psi*-field and the lower-level human cortico-thalamic circuit. These parallel layers or energy-levels are like reverberating circuits, and their integration suggests that the human apparatus for receiving psychic influences "from above" include not only the brain, but the thalamus and the brain stem and the sympathetic and parasympathetic nervous systems, which supply a measure of tonic influx.

Up to a point, the human organism is an "open system." The synchronous firing of neurons in the brain, known as the "alpha rhythm," is one form of resonance. Indeed, the whole cortex is a multi-layered electrical field, with ever-present electrical resonances going on all the time, and these express the simultaneous discharge of pools of neurons, rather than the firing of one neuron after another in simple chain-linked sequences. That is to say, the ten billion neurons of the brain resonate in accordance with overall fields of force, *which are electrical gestalten wherein the whole determines the activity of the parts, rather than the reverse.* If one can transfer this generalization to the Psychosphere, this supports the notion of consciousness as an induction or synchronism between the total human organism and the *Psi*-field energy continuum.

To a limited extent the ideas we have here stated and accepted agree with the views of Dr. M. Lietaert Peerbolte, and in the next section I shall try to give a more complete and coherent exposition of the views of this Dutch psychiatrist. This will also introduce a new topic.

X. THE RELIGIOUS AND THE SEXUAL REVOLUTIONS

One characteristic of the contemporary human being is his desire for "total experience." This movement toward "awareness expansion" will not be put down. Among the various ways in which such expansion of consciousness may be facilitated are the following:

a) Through the use of psychedelic drugs or hallucinogens, which supposedly lead to more profound mystical and aesthetic experiences, ecstasy, and "higher" states of experience.

b) Through meditation, intense concentration (*yoga* exercises), fasting, sensory deprivation, hyper-oxygenation—all of which are supposed to lead to altered states of consciousness.

c) Through the experience of sexual intercourse, which is now being experimented with in some Western schools of thought as the counterpart to certain Oriental (Hindu) practices. This reference to Eastern doctrines is not casual, especially if one tries to relate the Oriental *yang-yin* (male-female) dualism to certain doctrines of music as developed in our Western culture. Before going into that, however, let us turn our attention to the broad problem of the inter-relations of sex and religion. We start with the most general considerations.

The first point to make is that the topics of sex and religion should not be discussed as things in themselves; they should be dealt with in the context of a wider philosophical viewpoint. In terms of such an approach, one can treat seriously the proposal that in the future the "sexual revolution" and the "religious revolution" must be unified as two phases of a broad psychosocial transformation and spiritual alchemy. Sex energy is like nuclear energy—it must be controlled and sublimated, else it will destroy man's sanity.

The classical statement in Oriental culture of the complementarity of opposites was given by the Chinese philosopher, Lao-Tzu, whose *monad* symbolized all the fundamental dualities (see Diagram IX),

DIAGRAM IX

The Yin and the Yang represent the harmonious balance of Nature which alone makes possible man's life on the Earth. The Yin and the Yang are the negative and positive, female and male, dark and light powers typified in the Earth and the Sky, the great dual forces which control the Universe. Their inseparability is symbolized by the circle equally divided by a curved line.

and this included light-darkness; positive-negative; right-left; and of course, male-female *(yang-yin).* This doctrine of the "Is and Is-not" coming together illustrates how Lao-Tzu "tied" his philosophical knots "without rope," as he put it.

In the *Tao Te Ching,* written centuries before the Christian era, we have a description of the interaction of the polar contraries, Yang and Yin, as the basic forces of the universe. In recent years interest in Lao-Tzu's *Book of Changes (I Ching)* has greatly increased. Among others, the novelist Hermann Hesse was influenced by this classic in his formulation of the "bead game" as this was sketched in his book, *Magister Ludi.* Carl Jung also took a deep interest in *I Ching* and used its hexagrams as the basis for prophecies. Artists and poets also rediscovered this work and used its motifs in their own productions.

The hexagrams just mentioned are an integral part of *I Ching.* These are the 64 straight lines, with the undivided line being the symbol of the male or positive principle and the divided line the symbol of the negative or female principle.

These configurations in their various possible permutations are—so it is alleged—capable of representing all phenomena of the universe, natural and human. Here we see the recognition of the constancy of change, the cyclic flow of events, thus a philosophy of energies which wax and wane, relative to each other. This cyclicity reaches down into the elemental composition of nature to reveal the two primal forces, the male and the female, the sky and the earth. The *TAO* is this stream as it leads on towards a harmonious balance of opposites, satisfying both Yang and Yin: "everything produced by Tao is part of the unceasing movement and hence good." This, please note, is one form of the "broader context" wherein religion and sex may be viewed as unitary aspects of life.

Now let us consider another such approach.

The Theory of Emotional Syntony

In the previous pages we have mentioned the views of Dr. M. L. Peerbolte—broadly as a scientific theory—and promised to return to his system of metaphysics, but now focusing on his ideas about sex and religion.

Dr. Peerbolte is developing an entire cosmology on the basis of resonance-absorption of energies from the *Noosphere* or *World Sensorium* to the brain and back again. The "psychon" is the unit of consciousness arising from a direct induction between the free psychic energy of the ionosphere (for Dr. Peerbolte as for Mr. Sleeper, a kind of Van Allen radiation belt) and the human psyche. The brain emits a "photon" and the *Psi*-field a "psychon"—thus the condition for a resonance radiation and exchange. These two forces,

the physical energy of the organism and the psychic energy of the World Sensorium are like Yang and Yin, male and female, analogous also to the dualism of entropy and negentropy. Human psychic life, according to Peerbolte, is tied in with the pulsing *Psi*-field around the earth by a wave length equal to the circumference of the earth—and here Peerbolte and Sleeper are in agreement, whether they know it or not (by telepathy!).

If one asks for the factual evidence for such radiation and absorption of electrical current between brain and sky, the most impressive is mentioned in the book, *Cosmic Humanism* (p. 185), where reference is made to the circular reaction arc, i.e., when a current is sent through a solution in which a colony of paramecia is living, the organisms orient (align) themselves parallel to the flow of the current and point toward the same pole; while, on the other hand, if a living organism (salamander) is rotated, a field is set up. This "reciprocal causation" is very similar to the dynamo-motor principle. From this, in terms of the present view, one may then inquire: should it be possible on the next higher level for three billion humans on this earth to fixate a common psychosocial image, focus and concentrate a formative energy, and thus create an archetypal field of influence and bring the World Sensorium into a functioning circuitry and generate a "cosmic consciousness"?

Dr. Peerbolte's system involves a metaphysics of sex, and in fact "out-Freuds Freud." Electrical attraction is comparable to erotic attraction, *for the binding of protons and electrons in the atoms is like the male-female (sperm-ovum) affinity.* This leads to other facets of an interesting cosmology.

Borrowing from Freud's theory that *Thanatos,* the "death wish," is the tendency to return to the inorganic, Peerbolte sets up the following dualism:

Thanatos — — — Death Impulse — — — Entropy
Eros — — — Love of Life — — — — — Negentropy

This means that the *Psi*-layer is like an earth-god toward which one is drawn. Reincarnation is possible when the other half of the organism-psychosphere duality is floating about, above and around the earth. So long as one is not able to free himself from eros (lust), one is compelled to reincarnate on earth.

The spatial experience of seeing the earth from above—as when "viewing" Stonehenge and the Glastonbury Zodiac—is due to the "inner eye" which tunes in on the space-energy of the *Psi*-field. According to our Dutch psychiatrist, we must achieve the synthesis of cosmic *ēlan* with earthly sex drive, *and this will supply the missing link in Christianity*—he believes. The religious and the sexual

revolutions are here; they arrived together, and properly so, since there is a profound connection between the drive toward sex and the drive toward divinity.

The fact that man is an "open system" makes possible cosmic consciousness—what Peerbolte calls the "orgiastic experience of the space-energy of the *Psi*-field." That is, religious experience and sexual experience are both forms of "consciousness expansion." In the coming religious revolution sexual orgasm will resemble a "prayer"—it must aim at an experience in which cosmic unitary consciousness is achieved. That is the "mystical union." Could the cosmic sexual religious experience of the Hindu mystics be what Peerbolte has in mind?

Without committing ourselves to all that is implied in Peerbolte's viewpoint, we do want to indicate that there are themes here that we must return to in the formulation of a cosmic humanism. Let us be patient, therefore, while we turn to the next facet.

Sex, Music, and Religion

In the broader context of a cosmic humanism, one can now discuss the union of the sexes as the integration of the male-female principles of nature as these perpetuate the species through a kind of "harmonic-union-creation," as Esther Watson Tipple puts it. In this fashion the Yin-Yang duality stresses the profound bonds, not only between the sexes, but between all human beings, despite all contradictory appearances, thus providing a basis for a philosophy of peace. The overarching value of this approach is that it is in line with the powerful movement in Western thought which, in modern times, is illustrated by the Hegelian-Marxist *dialectic* and the *complementarity principle* of Niels Bohr and other prominent thinkers. The presentation of this way of thinking through educational media is an immense job still to be accomplished.

We have mentioned the Western interest in *I Ching.* According to Christopher Baynes,[16] the binary system of numbers of the Western world is identical with the system of *I Ching* in which the hexagrams are arranged in Dyads in a circular diagram known as Fu-Hsi (see Diagram X). We cannot delve into the metaphysical and astrological-theological applications as outlined for us by Mr. Baynes; but we must quote his statement that "there is no doubt that a competent musician could reduce this mathematical order to music . . ." Other "untapped possibilities" are also suggested. Among such which the present author has mentioned (see *Cosmic Humanism,* p. 335) is the work of John Benson Brooks, a musical jazz composer who is now absorbed in yang-yin and what he calls the "Archetypal Kinetics," which describes the way of playing an instrument based on an

application of the hexagrams to the problem of serial order, chance, indeterminacy and electronics.

I CHING
BOOK OF CHANGES

DIAGRAM X

FU HSI INVENTING THE EIGHT DIAGRAMS

Fu Hsi (2953–2838 B.C.), the first of the Five Emperors of the legendary period, is said to have been miraculously conceived by his mother who, after a gestation of twelve years, gave birth to him at Ch'eng-chi in Shensi. He taught his people to hunt, to fish and to keep flocks. He showed them how to split the wood of the t'ung tree, and then how to twist silk threads and stretch them to form rude musical instruments.

From the markings on the back of a tortoise, he is said to have constructed the EIGHT DIAGRAMS from which were developed the whole system of I Ching.

If, now, we can draw some of these threads together, we may be better able to exhibit the religious and sexual revolutions as two aspects of a common development.

What we have sought to show is that Cosmic Humanism, to be relevant to the new era of mankind, must try to provide an Oriental-Occidental harmony. This must lead to a new attitude toward the earth, toward nature and the universe, toward science,

religion, and art—all the enterprises of mankind on this planet. Strange as it may seem, mankind must learn to live with the fusion of the religious and sexual revolutions and contemplate the probability that the only resolution of the contemporary dilemma is to learn to transmute human drives and "spiritualize" sex to the point where sexual union becomes in fact a kind of "prayer." If this seems like some kind of "irreverence," this only illustrates the prurient attitude we westerners have inherited from St. Paul and St. Augustine—both theologically naive and provincial.

The idea that the "religious spirit" is not something segregated from the rest of life is developed by philosophers of such diverse persuasion as John Dewey in his little book, *The Common Faith,* and the Roman Catholic thinker, Father Alphonse Gratry (1808-1872), one-time critic of Papal infallibility, who in his *Logique* (English translation by Dr. Milton Singer) sought to show that such seemingly secular procedures as scientific induction of natural laws depends upon a consciousness of the divine—the feeling of transcendence—*which is like a prayer, the energy of movement, an awareness of a light that comes to understand and thus achieve a completed unity of subject and object.* All this seems like sheer mysticism. But it is interesting to recall that Gratry's views had no small influence on the thinking of Mary Everest Boole and her husband, George Boole, the latter being one of the founders of modern mathematical logic, the "logic" of the computer!

This high-level insight certainly tends to support the view that scientific methodology and research may be regarded as a striving for a kind of harmony or union of man with the cosmos—a syntony or prayer. This attitude toward science is illustrated especially well by Albert Einstein's famous essay on "Cosmic Religion," where he informs us:

> The Cosmic Religious Experience is the strongest and noblest mainspring of scientific research. The most beautiful and most profound emotion we can experience is the sensation of the mystical. It is the sower of all true science.

It is quite likely that a similar line of thought appears in Teilhard de Chardin's philosophy, just as it is manifest in Father Gratry's scheme of theology. This is a topic we cannot pursue here. But it seems to me that in Father Gratry, Teilhard de Chardin, and Dr. Peerbolte, we have merely different ways of dealing with love, sex, religion, and science—all looking toward a spiritualized and sublimated form of what are generally regarded as the most profound features of human experience. The manner in which music will fit in to complement the symphony of human existence also must be explored, and this is what we intend to investigate at more length in the next section.

XI. SPHERICAL MUSIC AND THE SPIRAL PATH

After extemporizing upon his musical instrument, the organ, Robert Browning set down the lines of his famous poem, *Abt Vogler.* From his imperishable lines, I quote the first stanza of his tribute to the magic of music:

> Would that the structure brave, the manifold music I build,
> Bidding my organ obey, calling its keys to their work,
> Claiming each slave of the sound, at a touch, as when Solomon willed
> Armies of angels that soar, legions of demons that lurk,
> Man, brute, reptile, fly,—alien of end and of aim,
> Adverse, each from the other heaven-high, hell-deep removed,—
> Should rush into sight at once as he named the ineffable name,
> And pile him a palace straight, to pleasure the princess he loved!

The elusive message of Browning's poem everlastingly haunts all lovers of the "lost chords." For the devotees of a "cosmic humanism," the meaning of all "chordiness" is generated in what is called the "unmanifest universe," and the tonal triangles resonate in and through the guiding fields of nature like the archetypal forms of the Cosmic Imagination as it plays the "spherical harmonics" of the universal symphony.[17]

What words! If this sounds like the metaphysical tinklings of an esoteric tone-poem, be not deceived. We are here not spraying forth the evanescent fragrance of a perfume from Araby; this is a serious proclamation of a program, a promise of work to be done. We neo-Pythagoreans will not be put down—not since the computer (as will appear later) informs us of a prize to be won and a gift to be bestowed. In all seriousness we proclaim that while humanism in the past has been earth-bound, now it is time to give it wings—*Ad Astra!*—and this is Cosmic Humanism's vision, aim, and thrust.

Beyond doubt, the one pioneer who has been most relentless in striving to link the cultural aspects of music—the "objective" in that sense that it is now a part of the record ingrained in history—with subjective synthesis by way of music appreciation is Esther Watson Tipple. In the first area, Mrs. Tipple and her colleagues are concerned with the ideological problem—how to span the gap separating Chinese, Indian, Japanese, and Western music. This is certainly a worthy goal. In the past each civilization possessed its own music (always recognizing the possibility of cultural borrowings from adjacent cultures). But a new era of mankind will move into a more universal music, and this harmonization will be discussed under the term "spherical music."

Along these lines, we have elsewhere noted the suggestion of Henry Cowles[18] that the *ragas* system of India is so complex and

orderly in its theoretical basis that all melodic forms that have appeared—East and West—have their places in it. But how all this will be assimilated into the global music remains to be seen.

There are five areas to which the broad term "spherical music" will be applied: (1) cultural evolution; (2) "spherical harmonics" in mathematics; (3) the subjective synthesis as embodied in the "music logarithmic spiral," as revealed by the *International Spiral Brotherhood;* (4) music therapy as it appears in *The Shining Stranger;* and (5) the spiral path of mankind toward the *World Sensorium.*

Having thus introduced the five research areas, let us explore further the types of problems that are opened up in these fields.

The earliest historical example of "spherical music" in the West was given us in the Pythagorean cosmology of the "music of the spheres," which later on fascinated Kepler so much. But in the Oriental world similar investigations were carried on, and it is quite possible that Pythagoras was familiar with some of these studies.

While all music has certain universal features—as the systematic organization of tonal patterns, for example—nevertheless the nature of music reflects the special conditions of that culture. In Chinese music, for example, it is known that this music had a cycle of twelve *Lyus*—it was based on a natural intonation, a harmonic series of arithmetical progressions. Perhaps they even realized that this had some connection with a spiral. As Dane Rudhyar informs me, Chinese music was based on what he terms a "zodiac of sounds," that is, a series of twelve equal intervals, and this was different from Egyptian and other forms of music.

From this it appears that the most one should strive for in the "music of the future," if it is to be a planetary music for all mankind—and this is one meaning of the term "spherical music"—is a unity-in-variety; one must not try to standardize world music into a monotonous uniformity.

It is important to preserve the variety of local cultures, especially in the arts. *But it is something of a paradox that man cannot preserve the diversity of provincial cultures unless there is a super-local agency with authority to recognize and protect the localisms.* On the other hand, one must also recognize that some cultural provincialisms—such as religious fanaticisms—should be destroyed, since they frustrate the coexistence of desirable localisms. Whether this applies to the arts as well is a problem as old as Plato and as contemporary as the problem of censorship of "obscenity."

Since music is instinctively linked with basic feelings associated with climates, continents, and peoples, an international music that supersedes and replaces all other local musics is not a desirable development. But coexistence—yes—if it is a world music, a

"spherical music," that would be broadcast all over the globe and be significant in the same way in which the Middle Ages used the bells of the churches to provide a frame of reference, not only as a time-piece for the populace, but also as a spiritual cement for social cohesion. Music in general is a spontaneous expression of life force and it must be free to develop. But there still are rules of composition; and the psychological-cultural evolution does indeed progress in an orderly fashion.

Before leaving the cultural phase of the topic of "spherical music," let us emphasize two things. In the first place, in studying the deeper aspects of sound and music, we must always recall the effects on living organisms in terms of their *magical power.* All ancient music, from that of India and China to Pythagoras, took this aspect for granted. We moderns have lost this altogether—except as we return to "primitivism." Can this *alchemical function* be restored? At least we can try, as we shall see later.

Secondly, and to become more technical, we must remember that the progression of the *Fifths* in relation to the *Octaves*—a harmonic synthesis of musical forms in cultures wherein different scale systems become mathematically assimilated into what we moderns recognize as a spherical complex simplified to the digits 1, 2, 3, 4, and 5—does in fact exhibit a mathematical substructure which is the same regardless of cultural contexts. Physics and mathematics are not "culture conditioned" as aesthetic tastes are.

This principle is so important that some additional discussion is called for. Here we are dealing primarily with the research of Mercator Music Foundation Research Associates, especially the studies of Esther Watson Tipple and Dr. Andrew G. Pikler.

The first job of Dr. Pikler was to carry forward the work of Gerhard Mercator, the 16th century geographer, and the contemporary work of Dr. Herman von Baravalle and Dr. Royal M. Frye. Dr. Pikler next made contact with the tonal spiral research of some Hungarian mathematician-musicians, and then, still later, with the Oriental cyclic concepts in music theory. Dr. Pikler presented the results of his "tonal spiral computer plotting" at the *International Congress on Acoustics* in Tokyo (August, 1968). The title of his paper is, "Generation and Plotting of Musical Tone Systems With the Digital Computer." Here it turned out that Dr. Pikler's "musical inventories by the complementals of Boolean algebra" fitted in nicely with the research and findings already achieved by Oriental (Chinese and Japanese) music theoreticians.

This provides at least partial confirmation of the thesis that the musical scale systems of different peoples can be mathematically oriented into a spiral complex when translated into digits 1, 2, 3, 4,

and 5. This means, as already noted, that a "spherical music" may eventually express the evolution toward a world-wide acceptance of a common tonal system, perhaps the Mercator, equal-tempered 53 tones-to-the-octave scale within the overall mathematical perimeter of the circle of Fifths—a "spherical music" that includes even the supersonic range. It is difficult at the present time to become thoroughly familiar with a musical system which has 53 intervals within the octave. But electronic equipment has been developed which utilizes the 53-tone scale and this is available to those who are occupied with electronic music.

Among the various lines of research which presently engage Dr. Pikler's attention are the fields of spectral analysis and the auto-correlations on the three formative numbers 2, 3, 5, which are privileged, though 7 is also admissible. But Pikler adds that every integer is admissible when the time reference is quickened. This is to be understood in the modern concept of precessed time, which was employed (about 1908) in Bergson's kinematic explanation of Einstein's results.

This obviously is quite technical, and I am not sure what the value of this line of thought may be, but I gather that the time-relativization makes it possible to apply music notions to the "singing" of both planetary and atomic orbits. In that event, a super-being of 1,000 year time span could be put on a one-second time-scale, and the sluggish orbiting of the earth would then be "sensed" as a Schrödinger electron and "heard" in terms of its wave-equation. The super-spectrum analyzer would sense the planetary system as a beautiful steady line spectrum and hear the Keplerian harmony as a sustained chord progression. According to such a viewpoint, it seems that *atomic numerology and planetary numerology should be integrated into a unitary wave-science numerology.*

Mathematical Spherical Harmonics

A second area in which the term "spherical" appears is in "spherical harmonics." From the name, one might think that this branch of mathematics has something to do with music; and to a limited extent this is true, since the mathematical analysis of musical patterns is done in terms of "fundamentals" and "overtones," i.e. Fourier's series, etc.

The equations of the branch of mathematics termed *spherical harmonics* are related to the isomorphic structures expressed in such seemingly diverse fields as the flow of heat, light, electricity, magnetism, stream lines, and conformal mapping. All such matters are discussed in the textbooks, as for example T. M. MacRobert's

book, *Spherical Harmonics* (1947). Following this approach, it is possible to discover how "spherical music" will find its applications: beyond Fourier series, Legendre and Bessel functions and their exemplifications to the higher "configuration" and "function" spaces. The value of this type of understanding is abundantly demonstrated by the work of Gabriel Kron,[19] who has employed differential geometry, topology, and *n*-dimensional formulations in representing the operations of generators and other electrical systems.

To be sure, the mathematical applications of "spherical harmonics" to biological, psychological, and social systems (extra-physical domains) is still in its infancy. But when the emerging electromagnetic social system finally has arrived, "electromagnetic spiral music" will find its proper embodiments. This is developed in my article on "The Electromagnetic Society," as this appears in the symposium volume, *Beyond Left and Right* (1968), edited by Richard Kostelanetz.

This brings us to the next topic, which serves both as a summary in transition and a preview of things to come.

The International Spiral Brotherhood

As we have seen, the emerging doctrine of "spherical music," as a kind of "circular stairway to the stars" marks also the path of man's progress through time. It is a rich and fruitful concept, filled with many applications, some of which are as follows:

1) On the socio-historical side, the concept of "spherical music," as we have noted, relates to the cultural evolution of musical scales—from Pythagoras, Huygens, Euler, Mercator, and Helmholtz, in the Western world—to all contemporary musicians of the world, East and West.

2) From the study of the historical evolution of musical forms we are led to the possibility of interpreting different human cultures in terms of the basic scale systems they employed, e.g., we may confirm that ancient Chinese peoples utilized the system of 12 Lyus or cycles of fifths, whereas the Hindus employed the Natural Intonations and 22 Sruti scales—and so on over the musical systems of the centuries. The legendary "tonal spiral" (circle of *Fifths*) takes us back eventually to ancient China and India, and from this Oriental matrix Western culture derived some of its inspiration and structural architectonics.

3) In the electronic (computer) study of musical forms, the computer system plots various types of tonal configurations (melody and harmony), and translates these into the Mercator musical spiral.

As employed by Dr. Andrew Pikler, the binary aspect of the octave intervals of the tonal spiral requires a Boolean algebra. Here the computer analysis is concerned with the generation of tone-systems by way of binary logarithms—something never before attempted.

4) A "spherical music" could be the formative theme for the development of a planetary music as a kind of "new world symphony"—a "harmonic-union-creation," as Thomas A. Watson put it, but now a blend or harmonic synthesis of Oriental and Occidental types of musical systems. Thus a "spherical music" would express a universal music based on the global acceptance of a common tonal system, perhaps a scale of 53 tones to the octave. This, once it is established and accepted, could have a unifying impact in the creation of a world civilization—especially if this music were broadcast over a global communications satellites system such as our *Project Prometheus and Krishna.*

5) The discovery that the complementarity of Boolean algebra ("generating musical inventories of the tonal complementals") parallels in results the tonal spiral of Oriental systems gives us a parallelism of the musical spiral as a brain (cerebral hemispheres) phenomenon and the emerging lobes of a coming *World Sensorium* as an electromagnetic-cultural integration. This spiral-like proliferation of an East-West synthesis still awaits its next "moment of becoming." According to Dr. Pikler, the complementarity (or "cross action," as Preston Harold terms it) reflects the Western mathematical approach to tonal systems, whereas the Eastern reflects more the philosophic intuition. Can a planetary music integrate these two themes? If so, will this, like the restoration of music's "magical power," require a harmonization of the "religious revolution" and the "sexual revolution" as these were discussed in the preceding section dealing with the Yang-Yin philosophy?

6) This male-female dualism makes contact with the Yang-Yin views as summarized by Ruth Borchard.[20] She states that the odd vibratory multiples (of frequencies), namely, 1, 3, 5, 7, etc., were regarded as male, while the even vibratory numbers, 2, 4, 6, 8, etc., were regarded as female by the ancients. Thus, as she puts it, "within the generated world each entity (note/number) is formed by the crossing of two polarities: major/minor, male/female, space/time, solar/lunar." But as she says, each entity is linked with others and to the source beyond all polarities. This restatement of the Yang-Yin doctrine has some relevance to our own synthesis.

7) Up to this point the most interesting homomorphism in a field filled with interesting analogies is Dr. Pikler's intimation of the possibility of a "double helix" in the domain of the musical tone

system, since the "sharps" and "flats" furnish helical formations, each separately split with the "Pythagorean comma" of Mrs. Tipple's diagrams. Dr. Pikler surmises that such a double helix could be formalized as a computer program. A somewhat similar vision can be traced in the "Cosmopheros" of Huygens.

It appears, therefore, that the promise and potency of a world civilization, a coming Planetary Democracy, rests with the future of music as a global language. The spherical-planetary music we project as a future programming could be broadcast via the UNESCO global communications satellites system—something to be created and shared by all the peoples of the round earth, helping to create a world mind for the world organism. Festival lights and carillons from the skies—literally a heavenly cinerama—is this the "music of the future"? The virtue of such a cyclodrama is that it makes contact with Preston Harold's "cross action," on the one hand, and with Pikler's "double helix," on the other, both in turn being phases of the "Radiations Belts of Thought" as developed in an earlier section and in my *Cosmic Humanism* volume.

Having referred to the views of Preston Harold as these are presented in the posthumous volume, *The Shining Stranger,* let us take a closer look at this remarkable work.

The Music of The Shining Stranger

Our studies of the vast fields of "spherical music" have covered almost everything in the universe—from atoms to men to the *Psychosphere*—and back again, full circle. I come next to the aspect of music known as music therapy. The student whose presence and authority we here invoke is the deceased and unknown author of the book published under the title of *The Shining Stranger.* The pen name of this anonymous author is "Preston Harold," and I shall use this because I know of no other. In summarizing his interpretations, I have had the benefit of valuable assistance from Winifred Babcock, who has served as Preston Harold's editor.

First of all, Harold emphasizes (p. 235) the role of *sound waves* in healing, pointing to a photograph of sound waves that produce a mandala-like pattern, the pattern Jung found to represent "wholeness." On p. 386, Harold re-defines life itself in terms of *sound* under the dominion of *mind,* which is to say, in terms of *word power.*

Certainly nature makes her marvelous *sounds,* but in the truest sense of the word, within nature only man makes *music.* Today, man believes that in splitting the atom he has released the "secret" of nature's greatest power. And now he begins to perceive that the atom itself is more "like" music than anything else. Perhaps Harold saw

that soon man will realize that sound and music enfold the "Alpha and Omega" of creative power, healing power, all kinds of power, but such power as can be used for the most part only in constructive ways. Today, there is great need of medical research to determine how sound and music can be used with the precision of a surgeon's knife to "cut out" and "cast off" that which is "offensive," and allow the healing process built into any body to restore it.

Harold's concept of giving a *measure number* to opposite forces in order to define and describe them seems to relate to music. That is, if a note in a minor key is at once the same sound and a different sound, it must be *more* or *less* of one sound. Therefore, if we see a minor key as representing the "negative" and a major key as representing the "positive," we can follow Harold's theory and assign *two* as the measure number of the minor, *three* as the number of the major, and *five* becomes the measure number of wholeness or the *one sound* which is played either in the major or the minor key—but cannot be played in both at the same instant of time.

If the foregoing is true, we cannot ourselves make the *one sound,* with measure number *five,* until we strike a *chord.* The chord of wholeness will "measure" three major, two minor notes. Wholeness can never be less. Harold's description of the nuclear force of the hydrogen atom can be read as: 3(+)/2(−). His description would say that a *chord* can be struck using a formula that could read: 2(−)/3(+), or 3(+)/2(−). These two would not *sound* alike, but either would convey the sound of wholeness.

If we relate this to Lao-Tzu's duality, the Yin-Yang symbol signifies *unity,* or "oneness." Harold's equation of *one* gives *five* as its measure-number (circle of *Fifths?*), and describes the unity of one as the "play" of the two fractions: 3/2 *vs.* 2/3. This coincides with the "Yang direction" vs. the "Yin direction." If the Yang components is seen as indicative of the "major" *vs.* "minor," and as "positive" *vs.* "negative" energy, what Harold says of energy and the Yin-Yang directions seem to fit.

It is as though some great, simple, basic truth has eluded man's grasp—and it has to do with this fundamental question of symmetry *vs.* asymmetry. In Harold's theory, asymmetry is the *manifest state* but *symmetry* is constantly regained as the "circle of operation" begins again. That is to say, as the asymmetrical 3/2 operates against the asymmetrical 2/3, the unity or wholeness of *one* is always regained: 3/2 x 2/3 = 1. It is always present or inherent throughout the operation (see *The Shining Stranger,* pp. 184-185; 190, 213). Always there are two themes, two frames of reference, each of which in itself is whole, and we must use each to understand each, and

neither one is "good" or "bad." If we are to express fully the potential in sound and music, both are necessary and each is both master and servant. Strange indeed!

The Harmonics of the Spiral Path

We come finally to the most eerie part of this journey into remote frontiers. This part of the safari relates to geographical areas, the "Lost Tribes of Israel," and what else that I do not foresee. The leaders of this hegira are Esther Watson Tipple and Katherine Maltwood.

For the past five years I have been studying the theories of Mrs. Maltwood as they relate to the Glastonbury Zodiac, this "heavenly pattern on earth," as she termed the "giant effigies" that supposedly are marked out on the "Temple of the Stars" in Somerset, England. The results of my own studies are set forth in a small book titled, *This Holyest Erthe*, which deals with this "most sacred spot in England" of Avalonia and Camelot.

At the same time, I have been concentrating on the findings of the Mercator Music Foundation Research Associates as their interpretations are presented in the form of what is termed the "music logarithmic spiral" (or "tonal spiral"). At the outset, these two lines of investigation apparently were unrelated; there was no obvious connection between them. But as the broadened meaning and implications of the "spherical music" idea emerged, I began to realize that there might—perhaps must—be some relation between these various sets of investigations: historical, geophysical, geographical, and musical. This follows from what I was simultaneously developing as a "vertical theory of history," to be explained in another volume, *Magnetic Moments In Human History.*

As one ponders the meaning of the "Zodiac message," a question arises: is there some sort of "reincarnation" of cycles here? And beyond that, comes another thought: as we seek to decipher the glyphs of the past, are we in the process of replicating, on a vast scale, the heavenly pattern on earth? If so, this would be the next proliferation of the spiral course of man's history toward the source of the "spherical music" heard in the ancient days in the temples of the mysteries—for example, in the Avalonian Zodiac which embodies the "organ of Corti" of Orion's ear in that Zodiac.

The connection between the Zodiac and the themes of the musical cosmology did not acquire a binding force in my own thinking until Mrs. Tipple conveyed to me her recollections of the research of Major John K. DeLoach. From these fragmentary memories Mrs. Tipple was able to put together some brief notes and from these and her Diagram XI, I have tried to form a more complete mental picture.

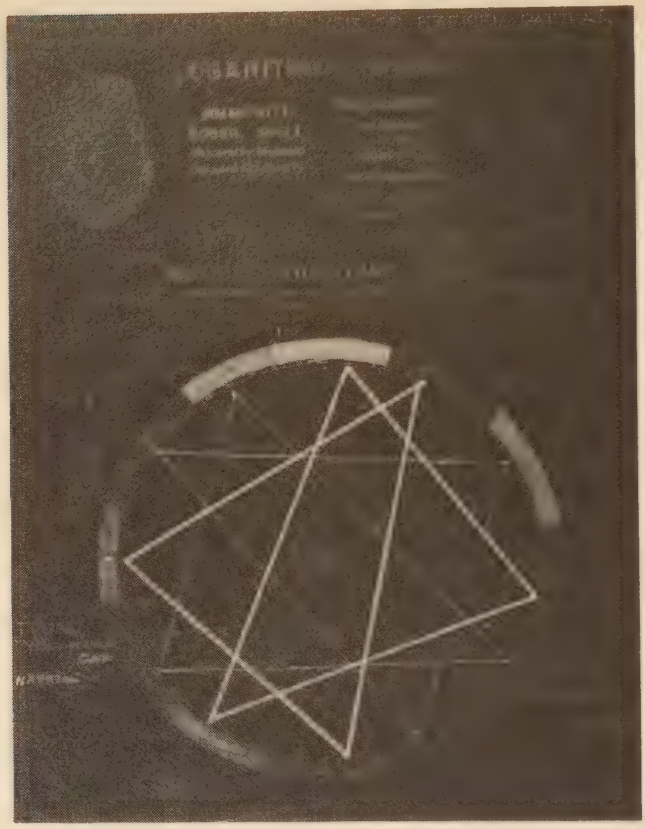


DIAGRAM XI

Mrs. Tipple reports that DeLoach was an engineer with some knowledge of ancient Chinese and Egyptian civilizations, and this background enabled him to delve into comparisons of the pyramid constructions and the specifications for the Temple at Jerusalem (Solomon's Temple), as this was designed to express the knowledge of the Hebrew architects who had studied under the priests of the Pharoahs. According to the story, this knowledge was also a part of the skills of ancient Chinese scholars concerning astronomical phenomena and studies. This, indeed, is quite a thesis!

According to Mrs. Tipple, close study of the unrecognized claims of DeLoach's findings confirmed the discovery that the account given in the last verses of the *Old Testament* book of *Ezekiel* could be tied in with the color scale of the "Hebrew mystic seven tone scale" and the later 12 tone or chromatic scale, when this is fitted to the Zodiacal pattern. The next step in the DeLoach-Tipple synthesis

was to relate this to Hebrew history and background. Thus, over the millennia and in an astounding way, Mercator and Newton are called upon to render assistance to Jacob and his twelve sons. It is not obvious how the "Walls of the Temple" are related to tonal phenomena—as Mrs. Tipple's diagram indicates—but clearly *Yang* and *Yin* will do their magic, and I can only report the results as these come to me. Even the *Star of David* finds its place in Mrs. Tipple's remarkable diagram.

Just because these relations loom so large in this Diagram, it is desirable to pause for a moment and go over this once more. Mrs. Tipple refers to Major DeLoach's analogy of the correspondence of the 7 tones of the Just Scale of C major placed in the 12 tone series as analogous to the way in which the 7 white keys of the piano keyboard are placed with reference to the 5 black keys to provide the chromatic or twelve-tone scale. In Mrs. Tipple's color diagram the sequence of names of the 3 tribes designates for each of the 4 gates of the city the place of the tone of these triads in the spectrum.

According to Mrs. Tipple, DeLoach's idea of Yin, the black triangle in the six-pointed Star of David was derived from the Song of Solomon's woman poet: "I am black but comely." And as if this embellishment were not sufficient, we are informed that DeLoach based his calculations on the geometric aspect of the passages in the Great Pyramid of Egypt, which he regarded as an embodiment of a sine curve, starting at the entrance, going down to the edge of the "Pit" and up to the King's chamber.

The connections here are not at all obvious. The statement that the Hebrews learned science from the Egyptians during the centuries of their captivity is credible. But how could that knowledge carry over into the alleged *tones-tribes-sons-colors* correspondences?

Some light may be shed on the "correspondences," if we can find a connecting link between "tones" and "colors." According to the Tipple reconstruction of Solomon's Temple, this is found in the colors of the precious stones that were known at the time the Hebrews built the Temple. The colors of the stones can be arranged in the order of the colors of the spectrum: red, orange, yellow, green, blue, indigo, violet. Indeed, the Biblical justification for the associations of the colors with the stones is given in *Exodus* (Chapter 28). But when the archaic religious symbolism is matched against the numerology of the 7 white keys and the five black keys to provide the "precognition" of the "chromatics" of the 12 tone musical scale, is this not stretching an analogy to the limit?

Ignoring the fact that the colors of the light spectrum were not isolated until Newton accomplished this (after all, the colors were in the environment to be seen as soon as there were eyes with color

vision), it still is true that the piano keyboard, with its white and black keys was an invention of much later date than Solomon's Temple and the musical scale employed by the ancient Hebrews. And if we derive all this from Egyptian astronomy, geometry, and pyramid engineering, this attributes to those incredible Egyptians of the early dynasties a preternatural cognition of "cosmic truths" such as no other people had—something that even the legendary Atlanteans would have marveled at.

All this—of a certainty—is wondrous to contemplate. But the end is not yet. The next inevitable chapter in the drama, for me at least, was opened up when it was recalled that Mrs. Maltwood had suggested that the *Twelve Sons of Jacob* are also the *Twelve Knights* of *King Arthur's Round Table*, and these both, for her, are nothing other than personifications of the *Twelve Signs of the Zodiac,* as these are carved out on the earth as the "giant effigies" of Somerset's "heavenly pattern on earth." The next problem, therefore, is to discover whether it is possible to match the Arthurian Knights with Reuben, Levi, Joseph, and the other brothers.

This once more raises the perplexing question of how the *Old Testament* teachings were transported to Britain in those very early pre-Christian centuries, when supposedly there was so little "overseas" travel. Now we know more about such journeys to far countries. Also, of course, the "British Israelites" have their beliefs about the "Ten Lost Tribes" who, they teach, journeyed to England and became the progenitors of the Anglo-Saxons. But where is the evidence to support this claim? The answer takes us into the hinterlands of esotericism, and here we can only sketch the far-ranging claims.

The Esoteric Doctrine of the Twelve

Here we do indeed have a congeries of speculations.

In her pamphlet, *The Story of Glastonbury* (Covenant Publishing Company, London, 1965), Isabel Hill Elder claims that she is telling the story of the way in which the "Levitical religion" of the "Hebrew Faith" traveled to early Britain. Here Mrs. Elder repeats the assertion made by others that the signs of the Zodiac were engraved, together with the names of the Twelve Tribes (and therefore the Twelve Sons of Jacob), on the breast plate of the Hebrew high priest; and she also reiterates the claim that every one of King Arthur's Twelve Knights was descended of Joseph of Arimathea—*himself a prince of the House of David.* Does this imply that the *Knights of the Round Table* were descendants of the *Sons of Jacob?* And how closely could one match the "Sons" and the "Knights"? The match should be good if Mrs. Maltwood is right in her assertion that the

prototypes for both the "Brothers" and the "Knights" are in fact personifications or reincarnations on earth of the *Twelve Signs of the Zodiac!*

When one compares Mrs. Elder's claims with those made earlier by Helena Petrovna Blavatsky, one cannot but be struck by the similarities. Such similarities are also obvious when one compares these with the views expressed by Mrs. Maltwood. It could be, of course, that all three are borrowing from the same primordial wisdom religion, the teaching of the "secret doctrine." The founder of Theosophy associates the number twelve with the 12 signs of the Zodiac, and these in turn, it is said, are the archetypes for the twelve Jewish Patriarchs. The words addressed by the dying Jacob to his sons, his definition of the future of each Tribe, the fact of the twelve signs on their banners—these all are part of the ancient "theo-cosmological and astronomical symbols and personifications," as Madame Blavatsky puts it (*Secret Doctrine,* Vol. I, pp. 712-715).

According to Madame Blavatsky, the *Old Testament* is filled with allusions to the twelve Zodiacal signs. Much of this lore was Aryan or Egyptian—she asserts—the sages of the latter country having secretly studied astronomy for over 40,000 years. Inevitably, therefore, the Old Testament story of the Dream of Joseph, who saw eleven "stars" bowing to the twelfth, which was *his* star, is a reference to the Zodiac, while the missing twelfth star is in fact a prophecy of the coming of the Christ. In this manner astrology, mysticism, and mythology are interpreted to lend support to each other—and the "everlasting truths" of Theosophy.

Of course, the straight-laced scholars will say that this is all too utterly fantastic to be taken seriously. However that may be, we on our part have some more wild geese to chase. The birds in question now circle around the number 12, in the same manner in which the signs of the Zodiac revolve around the central sun of our solar system (if momentarily we may return to the geocentric theory). And if we put this all together, we have the pattern of analogies which may be termed the *Mystery of the Duodecimals,* as follows:

Duodecimal Patterns

(1)	(2)	(3)	(4)	(5)
Physics	Astrology	Music	Religion	Mythology
(see below)	12 Signs of the Zodiac	12 Notes of Musical Scale	12 Tribes of Israel	12 Knights of the Round Table
			12 Sons of Jacob	12 Disciples of Christ

The statement of the physical ground pattern (1), is given to me by my collaborator at this point, Winifred Babcock, who provides me with the following from Preston Harold's *The Shining Stranger:*

> Harold mentions the number 12 on page 205 in *TSS*, pointing out that twelve segments converge in Eddington's drawing of 'here-now' representing space-time. Harold says that twelve 'thrones' govern man in space-time, but there is room for 'many more space properties.' I don't exactly follow this, unless he is hinting at 12 dimensions (4 more than you need!). The reference may be to dimensions of consciousness, or states of superconsciousness—since the 12 disciples represented the states of superconsciousness. However, if the patterns of nature are similar throughout the physical and psychical realms, 12 would have significance in both regards. The many more space properties Harold refers to bring to mind the many other configurations that are not included in the 12 of the Zodiac, which you mention (Orion, etc.).

So much for the physical or ground level of duodecimals.

The importance of the twelve in music, according to Mrs. Tipple, is that it represents a manifest situation wherein equal intervals of the 1 : 2 octave interval and the 2 : 3 interval of the Perfect Fifth approximate a circle. Apparently the ancient Chinese, who also discovered the 53-tone scale phenomenon in relation to these intervals, did not have a three-dimensional consciousness of this spiral form . . . they grasped it only as circular. Even in their painting they seemed to lack a third dimensional appreciation and the place of the spiral form in it.

Where Do We Go From Here?

All this is extraordinarily fascinating—and also quite baffling. What are the presuppositions, connections, and ramifications? I know that there are serious students working on the problems concerning the architectonics, the measurements and the proportions of the Egyptian pyramids, Solomon's Temple, the Glastonbury Abbey, and the Somerset Zodiac. But for myself, I must confess to a lack of the necessary skills and information to decipher this vast and awesome riddle—not yet anyway—though I hope someday to have more to say about this unfolding mystery play of the ages.

XII. HUMAN FREEDOM AND THE PSYCHOSPHERE

In this section we consider the question of the relation of the human individual to the all-encompassing global Psychosphere. The problem is this: does man have freedom within the overlordship of the *World Sensorium,* or does this philosophy of evolution require a complete determinism? Before we attempt to answer that question, let us recapitulate sufficiently to see what the determiners are.

We have proposed that humanity is in process of transformation—man is still evolving, on the psychosocial level if not the biological. The currents of compassion and integrative thinking are creating a field and this field is promoting synthesis of the next steps. Over a period of centuries, the time-curve of resonance is being synthesized—the confluence of deep currents is emerging as a movement toward unity, perhaps Teilhard's *Omega Point.* These "on" and "off" flashes of charismatic unity are like shadowy images that form in men's minds, images which in the past have dissolved because mankind has not thus far structured the reference frame to integrate and stabilize the pictures.

The Psychosphere or *Psi*-field is the key to the puzzle of psychosocial evolution. In certain respects the Psychosphere may be regarded as a psychic-magnetic environment, an "auric field," beyond the Van Allen Radiation Belt—an elastic membrane somewhat like the "pulsing ionosphere"—and perhaps subject to periodic pressures from the "outside" and the "inside," which generate influences that embrace the earth. There must be a coupling here between the human brain-mind and the Psychosphere. This is where we need the "bipolar theory of consciousness." In the process of the emergence of individuated consciousness, the human person, in concert with others, contributes to the universal mind-field. Here Intelligence, Love, and the Will-to-Good are the "carrier waves" of this wider consciousness. *Mystical experience means co-consciousness with this more universal or inclusive field—the mutation of illumination.*

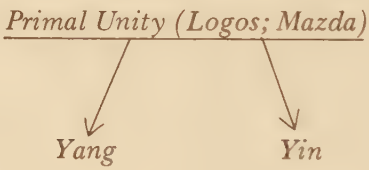
Man, accordingly, is not merely an embryonic nerve cell *(neuroblast)* in the *World Sensorium,* subordinate to the "social cortex," but a progressively integrating micro-organization in a macro-organization, participating in and contributing to the social cortex, thus helping to create the Sensorium and each man's creativity or contributory acts being a function of integration from above and below. But integration implies individuation, and this unity-in-variety can be the basis for personal freedom. And so we do not conceive the functional, ultra-stable dominance-subordination patterns in authoritative terms. There is here a mobility of individuals up and down, and this feed-back acts as the catalyzer for the emergence of the dominant from the subordinate.

In the process of spiritual growth one progressively links himself to this Psychosphere (a kind of Auric or Soul-Field), and this eventually repolarizes and transmutes the content of the Psychosphere. When this takes place, a new dynamism is generated in terms of response to the Soul-field and the individual who experiences this synchronism is "reborn" into the universal field—this being a real

"initiation." At death the psychic or guiding-wave part of the coupling goes back into the enclosing magnetic orbit around the earth, in a manner somewhat analogous to the "phantom wave" in the plasma medium.

When one considers what the above-mentioned "outside" could be, one thinks of impulses from the sun and/or planets—the "solar wind"—but one is tempted also to think of the possibility mentioned by Preston Harold, namely of a "mind-field." In Harold's cosmic scheme the force called "mind" is not accounted for in the physical universe. It is a neutral expression of the ONE energy because it is neither positive nor negative; it is the energy that can move with the "quickness" beyond the speed of light. Thus the "Q" energy that flows through space is identified with "Time," the mental energy approaching timelessness, because it is not confined within the flow of time-field-energy.

And if, beyond that, one seeks to relate Preston Harold's ventures to the Oriental world-views, which surely influenced him (as this is illustrated by his reference to "Yang" and "Yin"), one might propose the following Hegelian-type synthesis:



This is one duality. But there is another application of the Heaven-Earth polarity. The intense striving effort whereby mankind progressively seeks to understand and establish rapport with the *Noosphere* is in fact the very process whereby man is creating the *World Sensorium,* i.e., creative imagination generates the electromagnetic action-pattern whereby a kind of "mental foetus" is created through such acts of "self-fertilization." That is to say, the *World Sensorium* may appear as a kind of "virgin birth," at least when viewed from the lower dimension of the merely human. What the role of the "Sky Father"—the Sun—plays in this drama is still to be discovered, though we do know something about the role of the "solar wind" in the evolution of life on the earth.

On the surface, the problem we face seems to resemble the egg-hen dilemma—which comes first, the World Sensorium or the human brain-mind? Perhaps the answer is that they are evolving together. We must keep in mind that the notion of the "World Sensorium" as an "ultra-stable state," as this is explained in *Cosmic Humanism,* requires this. In the waking state we humans are conscious of the

electromagnetic patterns playing over the cerebral cortex (this is what we have always meant in our long-standing concept of "cortico-thalamic integration"); but we are not conscious of the particle-parts of brain matter as such. Now on the higher level, can man's consciousness as it enters the World Cortex to energize and sustain it be something that man as an individual can be aware of? In other words, is man conscious of the World Sensorium as a totality-integrated Soul-Field, or only aware of his own body-mind processes and the environmental sectors that impinge upon it?

I still am not sure that I have adequately stated the problem. Let me try again. The ego, which has its own level of existence and forms of experience, has its sub-systems, and these sustain the higher emergent system; but the functions of the lower parts as parts are not aware of the higher inter-parts system of communication, mechanical, chemical, neural, psychic. Thus each aggregate of cells (organs) of an organism (e.g., the liver, heart, stomach, retina, etc.) can do its own job without being conscious of the existence and functioning of other cells and organs, and this does not negate the organism-as-a-whole doctrine. So how about the individual human as a component of the World Organism: can he share in and know (experience) the consciousness of the supervenient giant being, when ordinarily his observations are confined to what transpires on his own level of awareness? The concept of the World Sensorium as an ultra-stable state should contain the answer.

There is still with us the perplexing problem of where and how human freedom enters into the unfolding program of conscious human evolution.

It is not clear how the opposition of freedom *versus* determinism is to be resolved. But at the very least, what each individual can do is utilize whatever measure of freedom, psychological and social, he possesses to create the conditions for man's attainment of an emergent cosmic consciousness, i.e., bend man's technologies, social institutions, communications networks, and the like, for the world-level synthesis in the hope that this physical, mental, and social unification of the planet earth will be accompanied by a spiritual unification. According to panpsychism, whenever we achieve the organic unity of a true emergent in the ladder of evolution (in contrast with the mechanical unity of an automobile engine, for example), the corresponding inner psychic unity of the organizing or guiding field also shows forth at that level.

If one then turns to practical techniques, how does one go about encouraging the emergence of the World Sensorium or Psychosphere? Compassion and "brotherly love" are certainly an important part of the quest for wholiness. In addition, as we proposed in *Cosmic*

Humanism, there is the possibility of laser beams to stimulate a more intense and coherent spiritual light. As the reader knows, the laser beam apparatus employs an ensemble of molecular particles which are stimulated by electromagnetic waves to produce amplified and coherent radiation. If by some yogic tuning within the human organism each cell might achieve something like a crystalline coherence, this would polarize the magnetic moments so that the body as a whole might pulsate in a coherent master cycle. The "beams" which emanate would then be synchronized in a charismatic chorus, with tremendous potentialities for social synthesis. I shall return to this.

If we think of the Psychosphere as charged with psychic energy generated by the brain-minds of men—the integration of a "make and break circuit," building up over the centuries—this could in time by "mirror reflection" convert into coherent radiation that would act as a laser force. We could learn to utilize the laser principle by generating thoughts in harmony with principles of resonance and thus stimulate a "spiral" effect to draw more people into the auric field.

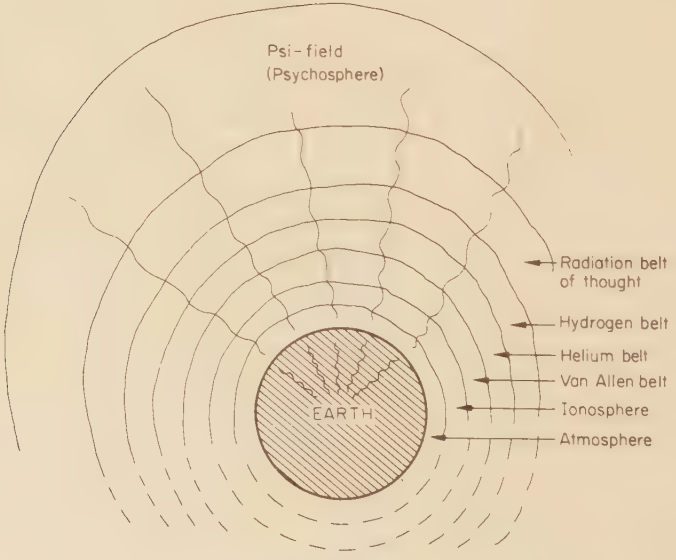


DIAGRAM XII

PROBLEM: How can there be octave frequency resonance or synchronicity between levels or planes of energies, that is, between the psychical energies of the "radiation belts of thought" (or Psychosphere) and the physical and the biological energies of the human organism and the cerebral cortex?

How this laser phenomenon is to be fitted into our theory—that the helium layer surrounding the earth constitutes the physical basis for the Psychosphere—is still to be worked out (see Diagram XII). In placing the other half of the consciousness-polarity in outer space, we mentioned the remarkable properties of Helium II, i.e., that if it acts as a superconductive plasma, it can serve as a "synaesthesia vehicle" for both sound and light wave manifestations.

Helium is especially interesting because Helium II, as a "superfluid," can creep up and out of its cup ("container") in defiance of gravity. This is partly explained by quantum mechanics, for these strange properties are connected with the fact that Helium II is in the lowest quantum state. As Andrew A. Cochran has noted,[21] the odd behavior of Helium II is suggestive of life, *where the wave properties are predominant.* This suggestion is similar to the idea I proposed long ago, even before Niels Bohr and others began to exploit the analogy of light to life and consciousness.[22] I shall return to this topic in Chapter 5.

But there still is a problem—a defect created by the virtue of the theory. Just because we postulate the Helium layer as the physical basis of the *Psi*-layer, and the medium for both sound and light, we run into the problem of "coherence" as mentioned above. The problem arises from the fact that sound and radio waves are normally coherent, whereas normal light does not possess wave coherence, so that optical coherence becomes possible only with the use of the laser principle (for reasons already given). We must therefore investigate to learn whether it is possible for the postulated superfluid medium to intertranslate sound and light coherence, back and forth, from longitudinal to transverse vibrations. This is necessary if we are to have the cosmic synaesthesia and synchronicity with the human subject that the mystical experience seems to demand. One can only hope that all this hangs together in coherent form.

As already surmised, the experience of the mystic as he loses his self-identity in the more inclusive unity may in truth be the synchronicity of the individual conscious chronaxy with the World Sensorium of *Psi*-Field. If so, the *World Sensorium* or the *Noosphere* concept is not mere honeymoonish dreamery. And we have thus solved the problem of the social embryology of the World Sensorium through a reconciliation of the doctrines of "preformation" and "epigenesis," an added gift which comes by way of some notions of gestalt causality. However, if we agree with Mr. John Bennett that order comes only from influences outside the system, the cosmos itself must contain the inciting agency—call it God, the Cosmic Imagination, Ahura Mazda, Tao, or whatever pleases you most. However, for our version of Cosmic Humanism this "outside the system,"

reflects the operation of influences from "higher" or more inclusive dimensionalities in lower dimensionalities—something that is entirely reasonable and "natural" in an 8-dimensional universe.

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3. Cf. "How We Know Universals," by W. S. McCulloch and W. Pitts, *Bulletin of Mathematical Biophysics*, 9, 1947, 127-147.
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5. Cf. "A Functional Study of the Nerve Elements of the Optic Pathway by Means of the Record of Action Currents," by G. H. Bishop and S. H. Bartley, *American Journal of Opthalmology*, 17, 1934, 995-1007.
6. Cf. "Functional Interdependence of Sensory Cortex and Thalamus," by Duser De Barenne and W. S. McCulloch, *Journal of Neurophysiology*, 4, 1941, 304-410.
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10. On this matter see the article, "Turning a Surface Inside Out," by Anthony Phillips, *Scientific American*, 214, 1966 (May), 112-120.
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12. Cf. Things That Go Faster Than Light," by A. Rothman, *Scientific American*, 203, 1960 (July), p. 42 ff.
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14. Cf. "The Pulse of the Earth," by John Lear, *Saturday Review*, February 1, 1969, p. 49 ff.
15. Cf. "Temperature of the Earth's Upper Atmosphere," by J. C. G. Walker and N. W. Spencer, *Science*, 162, 1968, 1437-1442.
16. Cf. "The Concrete Significance of Number With Special Reference to the Book of Changes," by Christopher Baynes, *Systematics*, 2, 1964 (September), 102-129.

17. The foregoing description of "resonance" is incomplete. In the famous lines of Browning's Abt Vogler poem the experience that out of three sounds are framed not a fourth sound, "but a star," we find that this results from a creation by way of "acoustic Bass," as this is known technically. Here the highly selective tone phenomenon of resonance represents a production of energy wherein the fundamental or lowest pitched tone in a series of overtones and the Fifth above it (the second overtone) combine to produce the "chordiness" (the "star"). The physics and the mathematics of this "chordiness" and its relation to resonance and harmonics are discussed in Alexander Wood's book, *The Physics of Music* (1962, p. 29 ff.).

    The above phenomenon was discovered by Tartini and was incorporated in Abbot Vogler's organ invention. According to Mrs. Esther Watson Tipple, Browning's perception of the psychological importance of Vogler's invention is one link in the chain in the Tartini → Vogler → Browning → Watson sequence which resulted in the "harmonic telegraph" that requires the undulating current of a make and break circuit. Mrs. Tipple, daughter of Thomas A. Watson, co-worker with Alexander Graham Bell in the invention of the telephone, believes that the so-called "accident" which produced the make and break circuit, was really a "divine intervention."
18. Cf. "International Music," by Henry Cowell; *World Union Goodwill;* Vol. 3, 1964, 22-25.
19. "The Application of Tensors to the Analysis of Rotating Electrical Machinery," by Gabriel Kron, *General Electric Review,* 38, 1935. This series of articles ran through eighteen issues of the *Review.*
20. See "The Harmonious Cosmos," by Ruth Borchard, *Beacon,* May, 1965.
21. Cf. "Mind, Matter and Quanta," by Andrew A. Cochran, *Main Currents in Modern Thought,* 22, 1966, 79-89.
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4

Man and the Cosmic Guiding Fields

> The Brotherhood of man will come only if the Fatherhood of God is recognized. Moral problems will never be solved unless they are treated as part of the structure of the universe.
>
> *Two Roads To Truth,* Edmund W. Sinnott

I. SCIENTIFIC MATERIALISM: FROM ATOMS TO MEN

THE NINETEENTH century was an era of atomism. Every atom of matter and every particle of the social system was an individual and absolute entity. The physical atom and the social atom were the indivisible particles of our thinking then. In social theory the nineteenth century glorified the individual—the successful individual. Like the ultimate particle of physics, every man was a self-sufficient atom of society. Professor F. S. C. Northrop attributes this idea to the influence of John Locke's philosophy; but my own studies suggest that the absolute individuality of "substance"—the subject of predication—was the consequence of Aristotelian Logic and metaphysics.

The materialism based on atomism, ancient and modern, continued on from the nineteenth century into the first quarter of the twentieth century, with the added impetus given to it by new developments in science. With X-ray eyes science saw through the warm personality of nature only the skeletal outlines of a world of masses in motion. Nature was no longer dressed up and therefore was not going anywhere. "Men are lumps of impure carbons," said one philosopher of science.

Eventually, when science discovered that the atom is not an

ultimate particle, not self-existent, but an organism dependent upon a field of space-time for its character and functions, the scientific and philosophical basis for atomic absoluteness and privacy was dissolved. Next, in the same way but on a higher level, it became clear that man is not an ultimate particle of society, that he does not create *de novo* the values he enjoys, but in part owes his nature and his values to his relationships—to his fellow men as well as to the outer world which is the vast continuum in which humanity lives and moves and has its being.

Today we know that the universe is sustained by a cosmic energy-reservoir; it is a powerhouse, and on the social level man is an evolutionary outlet for power. Man cannot separate himself from the cosmic powerhouse though he may limit or extend his capacity as an outlet, and in doing so the effects of his actions as an individual impinge upon others. What each individual does is a part of the social whole. Democracy is inherent in that fact. On the human level individuation takes on a new dimension; it implies not selfish rights, but consciousness of universal relations. It is through the fulfillment of individuation that man evolves from the sub-person, enmeshed in mass instincts, into the individual capable of choice and direction, and at last into the super-person whose relationships are consciously creative. The methods and goals of such creative self-evolution are being clarified and fortified by such thinkers as Alfred North Whitehead, Teilhard de Chardin, Pitirim Sorokin, and others.

While all this has been going on, the authoritarian religions have been on the retreat. Without launching into the history of the so-called conflict of science and religion—science and theology really—one can say that the enormous progress in knowledge in the recent centuries owes little to organized religion. If men turned next to science rather than to traditional religions for guidance, for the symbols of hope, it was because they felt that in science, not in institutionalized religion, are the springs of new truth. Science has been abundantly productive of fresh, upsurging ideas, theories, applied methods, and promises of a richer life. Science, in a word, is capable of continuous inspiration. Meantime, the institutionalized and authoritarian religions have been static and inert. Organized religion has no seers to offset the scientific knowledge of the mechanisms of the material world with any proof of the intelligible nature of that universe. Religion stood aside, adapting itself as best it could to scientific knowledge, until science contradicted its own materialism by penetrating through matter and moving into the hitherto unknown world of field plenum dynamics.

But that very energy-field had some revelations. Shaken up by the atom bomb, the scientists wonder what the broad implications are of

their new and astonishing findings (e.g., "Matter is non-matter in motion"), findings which undo the ancient mechanistic views in biology and psychology no less than in physics. It is a little late for them to concern themselves with religion and politics and moral values, "but better late than never!"

So long as scientists washed their hands of religion and theology and the theologians ignored the methodologies and findings—in astronomy, biology, psychology—no rapprochement was possible. Now, in this very shaky world, religion and science seemingly must unite to save that world.

II. VISION AND REALITY

Not a few scientists in the first quarter of the twentieth century regarded the problem of the religious and philosophical implications of the sciences as unimportant to science. We see now that they were shirking their duty. The whole difficulty of our society boils down to the lack of certain qualities in man that renders him incapable of closing the gap between man's knowledge and powers and the embodiment of these in the ideals and structure of his social institutions. We demonstrate infidelity to truth, stemming from the failure of our education and our religion and our sciences and our arts to create values which are worth sacrificing to attain.

Suddenly, with increasing automation in all areas, including the "think tanks" and "knowledge factories" of higher education, we see that man must reassert—perhaps really establish for the first time—his mastery of the "establishments" in science, religion, politics, and education. This means breaking down barriers, the walls of isolation, the "fragmentations," of our societies.

This is evident in the talk about the "two cultures" and how to bridge the chasm that separates them. An important part of this bridging mission is to heal the gaps between science and religion. This presumably is (or ought to be) the function of the philosophers. The program of harmonizing the motivations, achievements, and goals of the sciences and the religions is one of the more constructive undertakings that a cosmic humanism can assume, and we must therefore devote ample time to this project.

Without attempting to foresee the details of the synoptic view that may be forthcoming, one can safely predict that the new synthesis will make short shrift of mechanistic science and supernaturalistic religion. Dualism and fragmentation belong to the old order of thought; correlativity, complementarity, and integration belong to the new order. The new vision of reality will find a place in nature

for spirit ("guiding fields"), and a comparable place in the world of spirit for matter ("particles"). That is to say, matter and spirit will appear as two poles of one cosmos, just as body and soul are two poles of one organism. Or to put in other terms: *the reality of vision in organisms leads them on to visions of reality, "in order that the light from within may meet the light from without"*—as Goethe once put it.

III. SYSTEMS WITHIN SYSTEMS

The first job of the new synthesis is to discover how, in broadest terms, man and the cosmos are related. Given these empirically confirmed connections, we can then see what philosophical conclusions may be drawn, and what the next steps are. This will be a cosmic humanism in action.

As one student striving to work out some of the main features of the new synthesis, it seems to me that the universe is taking on the appearance of a vast system of systems. These systems within systems—Stulman's "fields within fields"—are organized in such a way that the more inclusive systems have feed-backs which in turn embrace subordinate systems in a hierarchy of processes, and these in turn produce or include new feed-backs and their values. The emerging relationships in their evolutionary sequences are able to develop (or participate in) new dimensions and these facilitate the spread of knowledge and materials over their own areas of flow.

But many conceptual tasks arise and must be dealt with before the ideological synthesis can be rounded out. Among such problems, still to be dealt with, are the following: How many levels of cybernetic feed-back are there? How do they interact? How far out into the cosmos do the feed-backs extend that affect mankind's destiny? To what degree are planetary, solar, and galactic cycles controllable science. And what are the broader implications of what Mr. Julius Stulman calls "fields within fields"?

The general philosophy here being presented is open-ended, and much remains for the future to unfold. Nevertheless, a few of the major features of my own interpretation are beginning to emerge and these will become evident as we proceed.

The Hierarchical Frequency Model

My own researches have moved in the direction of the "hierarchical frequency model," wherein we seek to understand how "micro-rhythms" are integrated into "macro-rhythms." Many of these frequency scales—the "fields within fields"—are orchestrated in

octaves and cycled somewhat like the second, minute, and hour hands of the clock. Also, in my own scheme there has been the possibility of parallel-induction interactions (sometimes "synchronicities") between levels, as indicated in the previous chapter. We have already pointed out that it will be a tremendous discovery when, and if, it is established that there are measurable relations between the rhythms and cycles of the cosmos, e.g., between the physical and biological organizations on the one hand and the specifically human characteristics on the other.

What we are saying is that the principles of synthesis that interrelate the physical, biological, and psychological homomorphisms (similarities of relation structures) are in terms of some sort of meshing of the frequency levels which arise in the spiral of evolution. Here apparently the environing fields on various levels which serve as media of interaction and synthesis can under certain circumstances expand, so to speak, and draw the surrounding fields into resonance with themselves. This is one key to the cosmic processes, and this "key"—as some students urge—must be turned seven times to account for the levels in the sequence of rungs on the ladder of emergent evolution. Clearly this addition of a novel member, not a member of the original ensemble, is equivalent to entering upon a new (higher) dimensionality, so that this in fact is only another way of stating the thesis of the 8-dimensional cosmos of a *Cosmic Humanism.*

In discussing the areas in which man-cosmos linkages are evident, it soon becomes obvious how artificial the divisions are in the so-called "specialties" of science. This fragmentation is yielding to the methods and tools of integration. The old maxim of "divide and conquer" is being invalidated as the breaking down of barriers proceeds.

The major fields that I shall survey are these: (1) Cosmology; (2) Astrophysics and Astronomy; (3) Physics: (4) Chemistry; (5) Biology; (6) Psychology; (7) Social Science; (8) Spiritual Concerns. Let us start with (1).

1) *Cosmology.* In the first place, as Dr. Henry Margenau[1] has pointed out, physical science in all areas operates with formal laws, such as the *exclusion principle,* and certain types of symmetry and invariance, which are timeless, omnipresent, and all-controlling, and these non-dynamic relations supervene upon force-induced phenomena.

This contradicts the popular notion that relativity theory means that "everything is relative"—including truth, moral values, and so on. This is a misunderstanding. The physical theory of relativity is a device for stating the laws of nature in such a way that they are

independent of any particular frame of reference—thus guaranteeing a certain kind of absoluteness. This logico-mathematical field of formal principles constitutes a *Logos Field* which, according to Margenau *(loc. cit),* may break through simultaneously in several minds in the form of paranormal cognitions.

2) *Astronomy and Astrophysics.* Here we deal with empirical generalizations in cosmogony, such as the principle stated by Einstein that gravitational forces acting on bodies have the same form as inertial forces (i.e., have the same acceleration, independent of the masses of the bodies), and so it is impossible to distinguish between them. This principle of equivalence (not the same as the equivalence of matter and energy, $E=m.c^2$), leads to the conclusion that inertial forces are gravitational in nature. In accordance with Mach's principle that the bulk of matter determines local behavior, Einstein assigned the inertial system to the fixed stars, i.e., an average of all matter in the universe. This means that Einstein's interpretation of Mach's principle implies that inertia is determined by all the mass in the universe.

In this area perhaps one should also mention that the physical principles of natural synthesis—"harmonic-union-creation"—are the same, whether we are observing the building of atoms and molecules in the stars and nebulae, or the synthesis of cells in living organisms on the planet earth—subject to certain restrictions of "cosmic chemistry" to be discussed later. In all cases of synthesis the role of *field forces*—electromagnetic, electrostatic, gravitational, and any resident plasma force-fields—is highly important.

Perhaps at this point I should pause long enough to make a comment on the pantheistic thesis concerning the eternity of the cosmos. I have been informed by Professor Henry Margenau that there are some physicists who would not agree with my proposition that the Cosmos is unbegotten, everlasting. Professor Margenau states that there is a real possibility that prior to a certain epoch there was no matter and no energy in the world at all. According to a thesis by Pascual Jordan (cf. *Die Herkunft der Sterne,* 1947), the total energy of the universe is very close to zero. In his book, *Open Vistas,* Margenau goes even further (pp. 230-231) and affirms that the whole universe could have been created *ex nihilo,* without doing violence to the laws of physics as we know them. For my part, however, this is not an adequate philosophy of science, and I still hold to the infinite and eternal universe of Bruno, Spinoza, and Fred Hoyle.

It seems to me that the doctrine of an infinite-eternal world of matter emerging from an infinite-eternal universe of cosmic energy is philosophically more satisfactory than any alternatives. It seems that Professor Margenau disregards the multi-dimensional aspect of our

cyclic-creative cosmology (8-dimensional). Today we are learning about the fantastic amounts of energy being poured into our galaxy by the 100 billion stars. Or perhaps, as recent findings suggest, there may be some influence at the center of our galaxy which acts as an energy source, this energy coming from a higher dimension, as Sir James Jeans supposed some years back. The concept of energy is still developing and will have to be revised somewhat to accommodate the 8-dimensional cosmos. *More creative semantics!*

3) *Physics, Celestial and Terrestrial.* In this section we come closer to physical chemistry or even chemistry. In any case, as part of the total picture we must somewhere bring out that the chemical elements entering into the composition of living organisms, including human beings, have been cycled through the interiors of the stars as these have undergone the processes of stellar evolution. Man and the universe are therefore related, if for no other reason than that our bodies and our brains came ultimately from the super-novae that exploded far out in space many billions of years ago. Here I quote Professor George Wald,[2] Nobel Laureate, who states:

> We living things are a late outgrowth of the metabolism of our Galaxy. The carbon that enters so importantly into our composition was cooked in the remote past in a dying star. From it at lower temperatures nitrogen and oxygen were formed. These, our indispensable elements, were spewed out into space in the exhalations of red giants and such stellar catastrophies as supernovae, there to be mixed with hydrogen, to form eventually the substance of the sun and the planets, and ourselves. The waters of the ancient seas set the pattern of ions in our blood. The ancient atmosphere molded our metabolism.

With reference to the problem of the origin of life on the earth, some new and interesting results are forthcoming.[3] Micro-wave radio signals characteristic of emissions from ammonia molecules (NH_3 have been picked up from the general direction of the center of our galaxy, and this marks the first time that molecules consisting of more than two atoms have been identified in interstellar space. The radio data indicate that the ammonia molecules are quite abundant in some of the turbulent gas clouds in the constellation Sagittarius, which is in the direction of the galactic center. Even more complex organic compounds may be present in this region.

These findings, along with the discoveries of wax-like substances in the interiors of meteorites that reach the earth from outer space, suggest that the stuff of life and the origin of living matter are not confined to our planet, but may have their precursors out in the wider cosmos. Perhaps we may even return to the earlier theory of Svante Arrhenius that spores of life are blown through interstellar spaces by the pressure of light to take root and germinate, so to

speak, whenever they reach a planet ready to cultivate the elementary living forms. In that case, life is eternal—like the cosmos.

Whatever the final solution to the problem of the origin of life, we know that the cosmic influences do affect the more developed living forms on the earth, and that these influences must come from the sun, the moon, the planets, the stars, and the galaxy—perhaps even extra-galactic systems. As we shall see in a moment, such influences may even affect so-called inorganic terrestrial systems.

These planetary configurations within the solar system cause electromagnetic effects that are both direct and indirect. In the latter case, the effects come indirectly by way of planetary modulations of the 11-year sun-spot cycles. Man is truly an offspring of a celestial marriage of father sun and mother earth, and both still exercise major parental control over their terrestrial offspring—mankind.

Various investigators have noted that the planets of the solar system emit fields of electromagnetic influence that affect the earth and its living populations. Also from rockets and artificial satellites we have learned much about the role of "solar winds" that flick out tongues of plasma to irradiate the earth and its living creatures. More recently, we have learned something about radiations from other planets, so that in a sense we can listen to "voices" from these planets—music from Venus, Jupiter, and so forth (see *Cosmic Humanism,* pp. 436-437). And such planetary disturbances are not confined to disturbances of radio reception, compass needles, and the like, for they affect human beings also.

It is now becoming evident that these effects of the sun and its family of planets can be quite important as factors in human behavior and welfare. As is now generally known, three New York scientists Doctors Howard Friedman, Robert O. Becker, and Charles H. Bachman have recorded the number of daily admissions in eight large psychiatric hospitals in New York and compared it with the variations at the Magnetic Observatory in Fredericksburg, Virginia. This index reflects, hour by hour, the magnetic activity of the sun. Statistical analysis during the period of the study showed that admissions increased on days of strong magnetic distrubances.[4] The explanation of the "control system by external force fields" is, in the words of Dr. Becker, that

> subtle changes in the intensity of the geomagnetic field may affect the nervous system by altering the body's own electromagnetic field.

If we combine this with other findings, we may conclude that the sun shares some responsibility for the fluctuations of hospital admissions. These studies concerning the role of electric and magnetic fields are entirely in harmony with the findings of Professor

Frank A. Brown and others on "biological clocks" (discussed later); but they are also surprisingly reminiscent of ancient astrological ideas.

But outside the solar system we have our own Milky Way galaxy. In my own "Cosmecology" article of 1937, there are suggestions about the possible biological effects of the motion of the earth and the solar system relative to the spiral nebula which is our galaxy. More recently other theories along these lines have been proposed. Among such is the theory that the inclination of the plane of the ecliptic (i.e., the great circle formed by the intersection of the earth's orbit with the celestial sphere) may be the cause of the earth's magnetism. This theory, based on the effects of the precession of the earth every 28,000 years, has recently been advocated by Dr. W. V. R. Malkus.[5] If this hypothesis turns out to be correct, or only partially valid, the precession of the equinoxes is not only related to a galactic background, but may also serve as part of the causal factors in geomagnetism, the earth's periodic field reversals, drifting continents, and therefore the course of biological evolution. This would indeed be a synthesis on the grand scale, truly a cosmic "strategy of evolution."

Astrophysicists know that the interplanetary, intragalactic, and intergalactic spaces are not empty, but filled with fields of force of various kinds. The term "magnetohydrodynamics" was coined to designate the study of such phenomena of interstellar space. These fields and plasmas mediate a "running dialogue" between man and the cosmos.

4) *Chemistry.* Quite surprisingly, it turns out that even chemical reactions on the earth are influenced by external planetary conditions, and these fluctuate with time. In a moment we will turn to this new field, which is now called "cosmic chemistry." But before that, let us recall that as part of the total picture, we now realize that the chemical elements entering into the composition of living organisms have been cycled through the interiors of stars as these have undergone the processes of stellar evolution. We have already quoted Professor George Wald to the effect that, "We living beings are a late outgrowth of the metabolism of our galaxy." Our own sun, as others have noted, is a second generation star so that somewhere "out there"—behind the sun and the earth—we have some grandparents.

As we have indicated, the field in which the most startling investigations have been carried out is now called *cosmic chemistry.* The scientist who has done the most work in this area is Professor Giorgio Piccardi, Director of the Institute for Physical Chemistry in Florence (Italy). His best known work is the book, *The Chemical*

Basis of Medical Climatology (1962). Beginning about 1950, his research has aimed at demonstrating that the wider cosmos, through the mediation of water, is able to produce effects on living creatures. Organisms, of course, are composed in large measure of this remarkable fluid. Professor Piccardi has shown that conditions in space control the seemingly capricious effects of activated water. Professor Piccardi has developed what he has termed the "solar hypothesis." The earth, while turning around the sun, races across our galaxy at the dizzy speed of twelve miles per second, in a path which is helicoidal or screw-like. The earth, therefore, constantly changes its position relative to the galactic field of force, and this, Piccardi urges, is one of the reasons chemical reactions take place at different speeds in different months of the year. The agencies resident in cosmic space can also modify the genetic factors in the birth and growth of human beings.

5) *Biological Sciences.* In this area we are concerned with the study of the cosmic laws and influences as they are reflected in the phenomena of the biological sciences. Here I can hardly do more than make mention of two fields of investigation, namely, (1) the new knowledge about "biological clocks"; and (2) the breakthrough in the study of heredity and mutation as factors in biological evolution.

Scientists for some time have been acquainted with the amazing precision of "biological clocks" in plants and animals. There clearly is some kind of "timer" at work here. With the advent of "information theory," the language of communication science and cybernetics is employed. It may be true that the universe is "talking to organisms," but how do living creatures use the magnetic information that comes to them? How do they participate in this "dialogue," if that is what it is?

Until recently, most scientists believed that the rhythmic patterns of living creatures on the earth had their pace-makers *inside* the organisms. Investigators in the field—students like Doctors Colin Pittendrigh and Victor Bruce—held that this time-telling sense *(Zeitgeber)* was based on inner rhythms, though of course connected with environmental cues such as light and moisture cycles and other planetary rhythms.

Contrary to this "endogenous" theory of the essentially inner origin of the time sense—i.e., that there are inborn biological clocks in plants and animals—the alternative theory, termed the "exogenous" theory, stresses that there are external magnetic, electrostatic, and electromagnetic fields of the earth and the solar system that regulate the time-clocks of organisms. These geophysical fields are in turn affected by the movements of the planets, the

moon, the sun, and perhaps movements related to the galactic background. Thus cosmic rhythms pace the biological clocks and the timing is not primarily controlled by a built-in heredity.

The outstanding advocate of this second view is Professor Frank A. Brown of Northwestern University. He cites many examples of the operation of biological timing which cannot be reconciled with the theory of the internal origin of the timing mechanism. He holds that the sources of the rhythms in plants and animals are external, imposed upon the organism by geophysical and cosmic environmental factors.

Of course, the most obvious resolution of this conflict of views is to recognize that there is truth in both theses and that a compromise is called for.

Still within the field of biology, the next interesting development is the discovery of the "double helix" structure of genes as strings of protein molecules. This gives a much clearer picture of the chromosomes as the bearers of the "hereditary traits" that are transmitted from generation to generation by way of the genes as the sub-units of the chromosomes. Until the development of "molecular biology," there was no knowledge of the *DNA-RNA* structure as the "coil of life." Also, for the professional biologists, even after the structure of the double helix was revealed, there was (and still is) no recognized or postulated *cosmological guiding field* for gene fabrication, cell reproduction, or the embryogenesis of the organism. For "orthodox" biology the genes and their mutational changes, which together are responsible for the ongoing course of biological evolution ("origin of species"), are among the "contingent" or "chance" relations that are peculiar to the evolution of living matter on the earth.

On this last point, the adherent of "cosmic guiding fields" does not agree. In the past, it has been asserted by the mechanists that the universe is "nothing but a mad dance of atoms," but a Cosmic Humanism would insist that the choreography cannot really be "mad," since in some integrative way the "strategy" was predisposed to culminate in the *DNA-RNA* strands of meaning which are the "code of life." This implies—as we have insisted previously—that just as gravity is built into the physical structure of the universe, so life is built into the chemistry of the cosmos, and mind is built into the organic world.

Those dreamers addicted to far-flung metaphysical speculations (and that includes the author) will conjecture that the "helix" structure is written into the very architecture of the cosmos. It is for that reason that the suggestion is advanced that perhaps an intelligent Guiding Field, the *Cosmic Lens,* is inherent in the vast universe, and in a sense planned the colonization of the earth and shot the

materials of life in its primitive form into our planet with built-in instructions, the code of life we now name the *DNA-RNA* double helix, to provide the archetypal lift for morphogenesis. This leaves it to us humans, once mankind appeared, to write the book of life as the story of man's efforts to build a guidance system to bring man to a reunion with the *Cosmic Imagination* as it spirals its way through the infinite and eternal matrix of reality.

Given the cosmic matrix just mentioned, the next step in my own program was to search for the possible links between the "twists of the tail of the coil of life"—the bonds between the double helix—and the encircling "radiation belts of thought" which are the circumambient or global basis for evolving human consciousness. This broad conception of a macro- and micro-cosmic induction was first outlined in some journal articles, and then subsequently employed as chapters in the book, *Cosmic Humanism.* Here the suggestion was developed that, aside from the pervasive influence of spirality (chirality) ingrained in evolving configurations from spiral nebulae to spiral field forces incurring across brain lobes, there are around the earth two belts—"Yang" and "Yin"—which engulf the globe and exert macroscopic guiding field influences in molecular synthesis of the coil patterns of the *DNA-RNA* molecules of the helices. The precise mechanisms for this homomorphism of the giant world-organism and the molecular configurations of the genes is not clear. *How to twist the tail of the double helix—that is the question!*

But the homomorphism is there to be seen, at least by some. For example, after the publication of my diagram in *Cosmic Humanism,* (p. 450), Corinne Frost sent me a reproduction of the Diagram XIII, "The Structure of the Cell," from D'Arcy W. Thompson's book, *Growth and Form,* and then added:

> I think of resonance effects of macroscopic and microscopic systems when I see your design of radiation belts, which is similar to the designs of iron filings around two poles.

This diagram in *Growth and Form* is the long-familiar picture of the two halves of the chromosome as it subdivides into separate parts which seemingly repel each other, traveling in opposite direction toward two poles. Later the spindle changes shape and the two groups form new nuclear boundaries as the cytoplasm divides, the astral rays disappear, and new cells form. Today, of course, this gross pattern of development is refined into the more detailed and intimate picture of the *DNA-RNA* helix, the subconstituents of the chromosomes.

As we are using our terms here, there is some relativity about the distinction between "macroscopic" and "microscopic." A moment ago we used Corinne Frost's comparison of the two-layer

"resonance," but one can find another level of correspondence between the microscopic mechanisms and the behavior of the system as a whole. This is suggested by Professor G. Evelyn Hutchinson in his *Marginalia* remarks,[6] wherein he reports on the "extraordinary effect of the rotation of the earth on the normal form of an

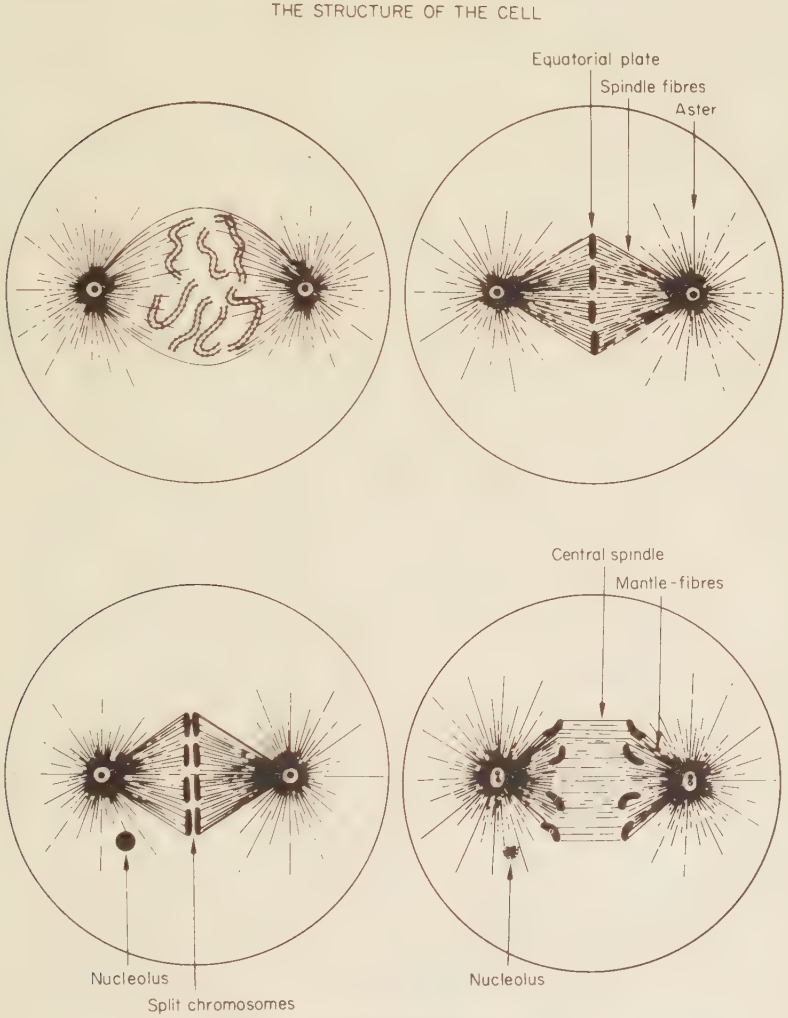


DIAGRAM XIII

In the above diagram each chromosome separates longitudinally and the two halves of the split chromosome now separate from and repel one another, travelling in opposite direction, as if they were being pulled apart by actual threads, in order to push the daughter chromosomes into their places.

Do we have here a picture of the dynamics of the *DNA–RNA* microscopic complementarity, analogous to the Psychospheric radiation belt isomorphism?

organism's behavior," i.e., where an animal which floats on the surface of the sea by means of a balloon-like sac does not drift directly down wind, but veers off to the left (in the northern hemisphere). The suggested explanation of the set to the left is the asymmetry in the structure of the organism. The curious thing is that in the southern latitude the mirror-image animals with the reversed asymmetry "presumably drift to the right as they move down wind." If true, this is another example of an inner-outer "resonance," but on a higher level than that considered in connection with the phenomenon of cell division.

Imaginative pictures of the "winding" of the strands of the double helix (the "winding of the armature," on the level of the brain lobes of the World Sensorium) are even now being formed. Some sort of "spinning" mechanism is required to get the strands of the gene molecules into the coil of the helix, and one such picture is sketched in a recent article of considerable interest.[7] The next step, of course, is to devise a mechanism for unwinding the chromosomes, and the technology for doing this is already on the drawing boards. If the synthesis of the two daughter molecules from the parent molecule is to be reversed, the separation of the chains wound helically around a common axis must be accomplished in a manner similar to the separation of the strands of an ordinary rope, i.e., through a rotation of the parent molecule with respect to the two daughter molecules. An ingenious picture of a possible circularity machine for rotating (unwinding) the replication process, and thus stopping *DNA* synthesis, has already been proposed by Dr. John Cairns.[8]

Now, if a momentary digression is proper, we may take note of the fact that in our studies of spirals and helices, the number 8 (eight) crops up frequently. In replication a string of amino acids forms proteins, and this string grows *slowly*, until the string is 8 units long, when its growth speeds up and becomes much *faster.* The explanation seems to be that *8 units form a string just long enough to begin a helix.* This means that a total pattern is now operative. In a quite different area this reminds one of Mrs. Esther Watson Tipple's *music logarithmic spiral*—though in this second case (see previous chapter) we are dealing with a *spiral* and not a *helix.* But there are families of spirals and by slight mathematical manipulations one can transform the one into the other, just as nature does.

Continuing with this digression for a moment longer, let us set aside our departmental "blinders" and involve ourselves in an interdisciplinary adventure. This is pertinent to the cosmic manifestations of spirality. The human inciting agent in this case is Dr. Andrija

Puharich. In a personal communication, he asks the question:

> How can we write the equation and score for the symphony of wave action that courses through man from the spin and precession of the lowest level electron within him to the waves that originate in the super-galactic systems and eventually in man?
>
> It seems to me that one of the clues lies in the fact that all biological systems can only incorporate levo-rotary amino acids into their proteins, not excluding *DNA* and *RNA*. There is no known reason for this biological bias. I would make the hypothesis that this phenomenon is not based on atomic bonding laws because it is just as easy to make dextro-rotary amino acids in a test tube as the other kind. I would suggest that molecular proliferation in living systems is under field influences of an unknown origin, if not type. A diligent search for this field source and dynamics might provide an essential theme of the symphony of life.

It will be noted that Dr. Puharich's idea is that we need to look to some other extra-galactic source for the influences that guide the synthesis of levo-rotary substances in living systems. But given the already known unidirectional motions of planetary, solar, and galactic rotations, *why do we need to look outside our own galaxy for some extra-galactic source?* Whether the galactic rotation is "clockwise" or "counter-clockwise" seems to me to be a matter of whether one in imagination is looking at the galaxy from the "top down" or the "bottom up." This is true also of the spider's web, a logarithmic spiral curiously enough.

What is true of the spiral nebula (galaxy) and the spiral web that spiders spin, is also true of the "Ezekiel pattern" into which Mrs. Tipple has translated her musical spiral. As we saw in the previous chapter, she regards the movement around the four gates of Solomon's Temple in Jerusalem as comparable to the complementarity of the Yang and Yin duality. This relativity of each to the other, which is analogous to the spiral of "Perfect Fifths"—there the major and minor scale are the reverse of each other when the arithmetic vibration frequency ratios are put into geometrical form in a spiral diagram—suggests that each of us contains elements of both Yang (male) and Yin (female), as indeed a knowledge of sex hormones in humans confirms. But I do not see how the levo- and dextro-rotary properties of amino acids (their power to rotate a monochromatic beam of polarized light) can be treated in similar fashion.

Finally, one wonders whether the prevalence of the number 8 in the above instances provides any basis for the conception of the 8-dimensional cosmos which our own brand of Cosmic Humanism espouses. The figure 8 is itself interesting: two loops (circles) which are symmetrical and reentrant, a symbol for infinity (∞) when turned upside down—is this our folded-over cosmos of the manifest-

unmanifest universes? Is the "eight-fold way" of ancient Buddhism and current physics based not only on the 8-dimensional sets of *Lie groups,* but on some deeper ontological basis, as C. A. Muses has proposed?[9]

Now let us turn to the field of psychology.

6) *Psychological Sciences.* In entering this domain, one feels like Dante when about to enter the *Inferno:* "abandon ye all hope who enter here." The very first problem we encounter—that of the nature of the time sense—brings us up against what is perhaps the most difficult of all conceptualizations, the problem of the nature of time.

The passage of time is from *past* → *present* → *future.* The discussion of this "flow" takes one into all "fields" and illustrates the artificial nature of the "disciplines" of the sciences. Our problem now, however, is in the field of psychology—the study of the origin of the irreversible experience we call the passage of time. The proposals to explain this experience are found on various levels of theory, some quite fanciful and unverifiable; others verifiable, at least in principle. Let us first glance at a rather "poetic" idea about the human time sense.

One of the interesting proposals is that we derive the *second,* the accepted time-constant of the world (comparable to A 440 *cpm* as the standard pitch for music) from the beat of the human heart. Mr. Gordon Speedie has put the question in this form: is it possible that in earlier times the beat of the human heart was one per second, and that this, in turn, was the beat of some cosmic rhythm? Is it possible that the rhythm of cosmic energies is transmitted to the human foetus, inside the mother, and that the embryo picks up the rhythm of the mother's beat? In a way, this reminds one of Galileo's observation in the Cathedral of Pisa when he timed the swing of the candelabra by using his own pulse beat as a timer (metronome) and thus discovered the famous principle that a pendulum of fixed length completes a long or short arc in exactly the same time.

This lovely "mother's day" thought of prenatal influence is indeed gripping; but so far as I know there is no evidence that connects the child's sense of time with the maternal heart-beat. Still less is there any empirical evidence indicating that, somehow and at long last, it will be found that the diastole-systole of the earthly rhythms, human and non-human, are a reflection of a cosmic heart-beat, the *om-om-om* of the cosmos, as it were. Philosophically, however, this remains as an intriguing possibility—especially in relation to Preston Harold's hypothesis of the universe as a living system. And of course, in the mean time, we do not retract any of the conclusions with respect to the work of Professors Brown, Piccardi, and the others whose works we have examined. At present, there does not seem to

be any "master rhythm" that integrates all the micro-rhythms; but of a certainty, before the work of the Integrators is finished, they will have discovered one.

On a more limited scale, as indeed we have already noted, it may be possible to relate the human time-sense to the "pulsing ionosphere"—to use Mr. Sleeper's term—through a synchronism between the alpha rhythm of the human brain and the resonance or ringing frequency of the earth's ionosphere. In this same connection, it is interesting to note that in his book, *Beyond Telepathy,* Dr. Andrija Puharich asserts that it is in the *Psi-plasma* field that consciousness inheres. A similar idea was advanced in my own book, *The Integration of Human Knowledge.* Dane Rudhyar has pointed out to me that this psi-medium seems to resemble that of the "astral fluid" of the Hindus, which they see filling the whole solar system. One wonders next whether Teilhard's *Noosphere* could also be related to such a physically defined region of circumglobal space as the "pulsing ionosphere" or the *Psi*-field. The one thing that is clear is that the alpha waves in humans must surely be a part of a tightly integrated universe.

Unfortunately, our ideas about the "universe" at present seem less unified than the universe itself. This is especially obvious since the advent of relativity theory and quantum mechanics. A complete picture calls for a glance at these developments.

Conscious Time and Relativity Theory

Some years back a distinguished scientist, W. Peddie, in an article on "The Fitzgerald Contraction and the Origin of our Experience of Time" (*Nature,* 156, 1945, p. 336), presented the idea that the origin of the experience of time may be found in the Fitzgerald contraction of brain material. This "contraction," the reader will recall, posits that the length of a yardstick is shortened in proportion to the speed at which it travels. No one, to my knowledge, paid much attention to this unusual hypothesis as Peddie developed it. And yet it may still have some value.

For my part, I do not see how or why the modest contraction of "brain material" could be a cause of any "lapse rate" of temporal experience, especially since we humans on this planet move at such relatively slow speeds. At the speed of light (were it ever attainable for human travelers) the material would contract to zero. But as we approach this, would our time-sense speed up or slow down—and by how much?

However, it seems that we might modify Peddie's idea and come up with another interesting hypothesis, namely, that the sense of time passage grows out of the motion of man's system (body-mind)

through the Cosmic Field (formerly called the "ether of space"). Conscious time would then be a manifestation of a kind of "ether drift experience"—but not the "contraction of brain material."

The difficulty which confronts our own modified hypothesis is the same as that which the physicists faced when they attempted to measure the motion of the earth relative to the ether as the fixed frame of reference (this is the famous Michelson-Morley experiment). As is well known, the physicists were unable to detect any such motion—hence the "contraction" hypothesis that Peddie makes use of, and hence, also, the Einsteinian relativity theory as an "escape" from the problem itself.

But even if the "old-fashioned" ether was expelled from physics, because it acted as if it did not exist, the notions of the fields—gravitational and electromagnetic—were able to survive; and it has seemed to me that perhaps the *Cosmic Movement Continuum* (a "sub-ether") could serve as a replacement for the older ether as a frame of reference for the time-flow experience. If we substitute the *Cosmic Field,* perhaps we may even harmonize this "ether-drift" origin of the time-flow experience with the "entropy flow" theory of the unidirectionality of conscious time (this latter to be discussed in the next section), by supposing that *the entropy-trend guaranteed by the second law of thermodynamics is a kind of modulation superposed on the more basic time-flow experience as it emerges from man's passage through the Cosmic Field—or a Psi-field that inheres in a higher dimension.*

Before leaving this topic and turning to "entropy," let us note that as a part of the total puzzle picture, we must keep in mind that, since the acceptance of Einstein's general theory of relativity, Schrödinger has shown how to translate Maxwell's electromagnetic theory into the doctrine of quantum wave mechanics. But the complete fusion of relativity theory and quantum mechanics is still to be achieved, and it is not yet clear how the unidirectionality of experienced time can appear as a natural outcome of the hoped-for synthesis.

Now let us turn to the concept of "entropy."

Entropy Flux and Time Flow

At present there is one rather generally accepted theory concerning the psychobiological basis of the flow of time. This idea is related to the second law of thermodynamics, a law which guarantees the irreversibility of "time's arrow" that inheres in the "increase of entropy" principle. It is not clear who deserves credit for first proposing this relationship; though I do recall that my own proposal[10] along these lines antedated Sir Arthur Eddington's views as set forth in his well-known work, *The Nature of the Physical*

World (1928). In any case, an experimental basis for this association was later provided by the brilliant work of Professor Hudson Hoagland.

It is true that this physical-biological-thermodynamic synthesis does not do full justice to all the facts—for example, the sense of time as evidenced in post-hypnotic suggestions; Bergson's ideas on "real" or psychical time (*durée*), as opposed to the "spatialized time" of physical approaches to biological problems. On the psychical level it seems that there can be a kind of "stepping outside the time-line," and this brings us back to the *vertical versus the horizontal theories of causality in history*. We are not yet done with that.

Returning momentarily to the theory of time flow as an expression of entropy-trend as a modulation superposed on a basic "ether-drift" consciousness of passage, it may be noted that this would not clash with the established fact that heat (infra-red) rays as well as electromagnetic radiation expands outward into space and that man has a coded relation to this entropic expansion of radiation into cosmic space.

There is no question but that, within certain ranges of observation, the second law of thermodynamics and the "expansion of the universe"—whether this be into finite or infinite space—are two manifestations of the same underlying physical situation. However, the idea that the second law reigns supreme for the cosmos, so that, for example, the universe must eventually "run down" into a "heat death" *(wärmetod)* is a conception that I have always rejected. Aside from the obvious fact that the universe has not run down—indeed, could not run down if the infinite-eternal universe of Bruno and Spinoza is correct—there is evidence of another sort pointing to a limitation of the second law.

This is connected with such considerations as are pointed out by Mr. A. A. Cochran,[11] as he explains that in dealing with superfluids (e.g., a plasma like helium II) at low temperatures, remarkable properties emerge. When this type of matter is cooled to this very low temperature of liquid helium, the tendency toward thermal disorder, in accordance with the second law, disappears and the wave properties of matter prevail. Here phenomena similar to those exhibited on the level of *life* and *consciousness* appear.

This near-approach to the field of consciousness brings us back to the role of the *Psi*-field or Psychosphere. That wave mechanics has implications for the mind-body problem is a theory the writer advanced long ago.[12] The venture into the field of the Psychosphere brings us into the area of the "spiritual." My own views in this

territory may be summarized in the following formula:

$$\frac{\text{Soul}}{\text{Body}} = \frac{\text{Energy Field}}{\text{Matter}}$$

Or in ordinary English, "energy is the soul of matter." Later this was amended to bring in another "pole" to end up with a *bipolar* theory of human consciousness, i.e., that consciousness is a *bipolar* resonance between the human cortex and some "field" or "sphere" out in the enclosing dimension of the *Psi*-field (variously called the *Psychosphere, radiation belts of thought,* etc.) For reasons which are developed in the next chapter, I have suggested that this "sphere" might be associated with the helium layer 800 miles out in space. If such thinking seems like materialism, remember—it is a "divine materialism."

Now, to continue this survey of man-cosmos relations, let us move into the area of social phenomena.

Social Sciences: At the present time there is a widely-held belief concerning the futility of all other social reforms until the urgent problems of over-population and imminent famine are solved. Most social scientists are inclined to agree with this. And yet it seems barely possible that an accelerating increase in population may at the present time be a part of the "grand strategy of evolution." That things must grow "worse" as a result of sheer increase of mass and density ("complexification") may be necessary in order to reach a critical point where there can be a "transformation of quantity into quality"—as with the "critical point" in temperature increase in order that water can be changed into steam. In their own and different ways, Karl Marx, Teilhard de Chardin, and Sir Julian Huxley have called attention to the fact that certain human phenomena require a build-up of psychosocial pressure before man can achieve a breakthrough into a new level of comprehension and mastery.

My own thoughts in recent years have been concerned with the planetary emergence of a *World Sensorium*—something of a cross between H. G. Wells's *World Brain* and Teilhard de Chardin's *Noosphere.* In part this theory is based on an analogy between the human brain and a proliferating world brain. The cerebral lobes of man require 10 billion nerve cells to provide the basis for human intelligence and consciousness. This is one of the factors that elevates man above the apes. If it is also true that the "world sensorium" will be constituted of humans who serve as the embryonic nerve cells (neuroblasts) of the evolving sensorium, a minimal number of such "electronic tubes" seems necessary to build the world sensorium—the

cortex of the world-brain. Perhaps these cells of the giant organism may then constitute the components of the step-up transformer through increase of creative tensions to break through to a new level of integration. At that stage, the circumglobal matrix creates, or enters into resonance with, a new energy level, thus somehow making possible the experience of "cosmic consciousness" which Maurice Bucke and others have pictured for us.

The reasoning here is not merely based on analogy. There is empirical evidence tending to confirm the theory of the response of humans to the electromagnetic conditions of the planetary environment, as I have pointed out in the book, *Cosmic Humanism.* In my program I have sought to relate these developments to the thesis concerning the emergence of *homo electronicus*—a view enunciated quite some time before Marshall McLuhan expounded his ideas on the "electronic culture." For many years it has been an integral part of my formulation of the emerging world sensorium of the earth-organism that the two hemispheres of the globe function as the lobes of a world-brain, the rotating armature spinning out the lines of forces (functional nerve fibers) of the proliferating electromagnetic society.

This view, now sailing under the banner of a "cosmic humanism," *is seeking to formulate the laws of harmonic synthesis that govern the power of resonant thought in a Psi-field which functions as a kind of plasma surrounding the pulsing ionosphere.* In some manner not yet clear this higher medium acts as a guiding field for human evolution. In terms of such a conception, it still remains to be determined what the role of population increase may be. We may not yet have reached the optimum population density for the step-up transformer to establish resonance with this hyper-physical field.

Sociologists and demographers have for some time been studying the effects of population density on human psychosocial relationships. Maps for "demographic energy potentials" have been worked out. We all know that increasing density of population is responsible for increase in number of interactions among humans, and these can be causally connected with "riots" and other forms of mass behavior. But increase in number of interactions is a *quantitative* factor. Whether increasing population density and "complexification" are "good" or "bad" from an ethical viewpoint may depend, I think, on the *qualitative* factor of leadership.

Some social physicists have compared human beings to molecules of a gas. Henry Adams made use of the thermodynamic analogy in his study, *The Degradation of the Democratic Dogma.* But Maxwell, who worked with this problem of "degradation," also pointed out that a "sorting demon" could reverse the trend designated by the

second law of thermodynamics, i.e., could reverse the trend toward a uniform "dead level." Later on this trend was connected with *entropy.* The "sorting demon" is an anti-chance selector of the molecular movements of the gas, and this could reverse the trend toward "social chaos"; it would "integrate" toward another kind of organization. (It has been argued, however, that the "demon" could not really defy the second law, because it does introduce energy into the system, which then no longer is a "closed" system.)

It should always be remembered, however, that the second law is a hypothetical statement: *if* a system is "closed" (i.e., no energy is introduced from without), the potential energy in it will run down hill, degenerate into heat, which in turn is radiated off into space and becomes unavailable for useful work. The mathematical designation for, and measure of, this degeneration toward chaos (in the kinetic theory of gases) is *entropy,* which is technically defined as the logarithm of the probability of the system. But few systems are "closed," especially living systems, which borrow energy from the environment (light for photosynthesis in the case of plants, and food for animals). So far as I know, no scientist can prove that the cosmos ("universe as a whole") is a closed system; nor can he prove that it is open. If, following Bruno and Spinoza, we hold that the Cosmos is infinite (unlimited) in its space and time aspects, the "laws" for finite systems are irrelevant to the unbegotten cosmos.

But—to repeat—within our observable universe both entropy and its opposite, negentropy, are genuine natural trends—the former being best illustrated in the "inorganic" world and the latter in the "organic" kingdom. I have tried to generalize these "downward" and "upward" paths in a broader pattern in *Cosmic Humanism* (see pp. 292 and 310). Following John G. Bennett's lead, I have substituted the term *syntropy* for negentropy or anti-entropy, as follows:

ENTROPY: *The Death Principle*

The second law of thermodynamics—the increase of entropy—is the physicist's expression of the "death wish"; it is the doctrine of the ultimate running down and death *(wärmetod)* of the universe; it asserts the loss of free energy, the increase in chaos, in ignorance.

SYNTROPY (NEGENTROPY): *The Life Principle*

Negentropy is the basis of knowledge, of information, of order, structure and organization, the evolution to higher forms, of the "life more abundant." "Life feeds on negative entropy," as Schrödinger puts it.

ORTHOSYNTHESIS: *The Psychic Principle*

The levels of life on earth increase continually in quality, i.e.,

depth and intensity of consciousness, as organic systems evolve toward higher orders of subjectivity in experience.

Obviously, the *entropic*, the *syntropic*, and the *orthosynthetic* trends in the above scheme are related to the involution-evolution (or downward-upward) paths of nature, man, and society.

The analogy on the human level for Maxwell's "sorting demon" would be the "leader," who—for better or for worse—guides the dissipation of energy (increase of "entropy") into the creation of new organizations of entities. And here is where Henry Adams's "degradation of the democratic dogma" goes astray: he didn't see that *entropy → empathy* can be used for constructive programming when a creative "demon" (Socrates's *Daimonion*) is at work as a guiding field, rather than a Hitler. This shortsightedness *may* also be involved in the thinking of those demographers who are alarmed at the "population explosion" and therefore willy-nilly want a non-selective (or non-guided) birth control. What we need is a new type of eugenics—*orthosynthesis*.

This entropy-empathy line of thought appears in Preston Harold's book, *The Shining Stranger*. I dealt with this theme in my talk at the *TSS* symposium in New York City, March 1968 (to be published separately under the title, "The Genius of *The Shining Stranger*"). To clarify this, here is an example: If at "Resurrection City" in Washington, D. C. (1967), the "heat" generated by the Poor People's concentration in the National Capital (which increased the population density there) the Blacks could have had a Martin Luther King type of leadership, something more constructive might have been achieved. As it was, mostly "noise" and "heat" were generated, which was dissipative in a non-constructive way. Generalizing this principle, the Harold formula would have to be reinterpreted into the following dualism of the "upward" and "downward" paths:

entropy → empathy → (love) → syntropy → (= "negative entropy")
entropy → empathy → (hate) → (dis-syntropy) → (= more "entropic chaos")

So the world must choose: *Love → integration*
Hate → disintegration

Both processes seem to occur together in time and require each other. As one "loves his neighbor," he strives to integrate a more inclusive community, and this process of syntropy occurs *outside* the system of his own body-mind; but at the same time he dissipates energy that comes from *inside* his system. Eventually the charismatic person dies and his energy potencies are used up; but meantime he may have helped create a higher-than-himself integrate which outlives those who helped create it.

The foregoing pattern is only another way of putting the relationship previously sketched when we borrowed from Freudian theory the idea that *Thanatos*, the "death wish," represents the tendency of the human organism to return to the inorganic, and *Eros* (or *agapē*) represents the "life wish," yielding the following paradigm:

Thanatos — — — — "death impulse" — — — — *entropy*
Eros — — — — — — "love of life" — — — — — *negentropy*
Agapē — — — — — "love of mankind" — — — *syntropy*

The paradoxical dualism of the "upward" and the "downward" paths is evident. The two processes of integration and disintegration occur on all levels and are a part of what Preston Harold regards as the "universal cross action." There is no absolute act. Good and evil are relative to each other. That is why Jesus was (and had to be) betrayed by Judas, whose betrayal of the Master was necessary to the completion of the drama. Perhaps it is unfortunate that "good" and "evil," "integration" and "disintegration," are two sides of the same coin, since this is not only coin of the realm but also coin of the cosmos. But that's the way things fell out.

V. THE MASTER CYCLE?

From the foregoing survey it is evident that the cosmos as seen from man's position here on the earth is a vast system of cycles within cycles. These appear to be arranged in the form of interlocking guiding fields—an Ezekiel's pattern of wheels within wheels. So far as we can see now, the earth is unique as a spinning globe within the solar system; it appears to us as if the planets, the sun, and the spiral galaxy which is our "Milky Way"—these are all a part of the "fitness of the environment," as Lawrence J. Henderson put it, and *they are where and what they are* in order to serve as a cosmic nest (a "Chinese box" or "Cretan labyrinth"?) for the evolution of life, mind, and spirit, here in this part of what Giordano Bruno called "the infinite universe and its worlds."

The problem that insistently presents itself is the philosophical question: is there any master cycle—a cosmic feed-back beyond the *matter* $\rightleftarrows$ *energy* cycle—that controls all the subordinate cycles? Is there, for example, any way to connect the "music logarithmic spiral" with the zodiacal, historical, and spiritual "psychodynamics" as the Tipple-DeLoach synthesis insists?

One of the strange things in my own experience in the last several years is the manner in which the Ezekiel pattern has repeatedly cropped up. This pattern has been discussed in previous pages, where

the schematism of the 12 sounds of the chromatic scale, the 12 sons of Jacob, the 12 signs of the Zodiac, the 12 Knights of the Round Table, and other duodecimals, have been viewed. Is there in these analogical patterns anything more than coincidence, or do these cultural homologies point to some deep and underlying causal connections?

My first surmise was that the Tipple-DeLoach psychodynamics as applied to the "Ezekiel Pattern" (Diagram XI) was fanciful. But now it appears that the linkage of the four rows of the "sons"—three placed at each of the gates of the four walls of the Temple—was "foreseen" in *Exodus* (Chapter 28), where the association of the colors of the stones and the Twelve Tribes of Israel (4 x 3 = 12) is "confirmed." Is this one of the "magnetic moments in history," destined to be repeated in the higher Psychosphere as the "Temple of Wisdom"?

Still another example of the "Ezekiel Pattern" was recently presented to me by Mr. John Konn of Pittsburgh. A few years back Mr. Konn felt impelled to purchase the prerequisite art materials and begin to paint a series of geometrical patterns which, he urges, duplicate Ezekiel's "wheels within wheels" vision. In a sense, these art panels are like an "automatic writing" performance, since Mr. Konn is not an artist or draftsman, and these lines of the "wheels within a wheel" come to him as if in a dream. The veiled meanings of these "visions" will require an understanding of the symbolism of Alchemy.

The strange—even exciting—thing about this is that it is possible to relate and translate Mr. Konn's diagrams into the verbal exposition in the "wheels" in Jacob Boehme's well-known work on *Aurora,* a classic in the literature of mysticism. Thus in Mr. Konn's diagrams and in *Aurora* we have two different languages for expressing and transposing Ezekiel's pattern. I shall return to this theme in the *Magnetic Moments* book, and there I shall reproduce Mr. Konn's diagrams and the relevant passages from *Aurora.*

The Diagrams themselves, unfortunately, are static representations, the "wheels within wheels" being pictorial representations that remind one of the "watchmaker theory of the universe." My own interest is in the dynamics behind the "wheels" (*circles* in the Konn Diagrams). If one could pull this diagram out like an accordion, in an orthogonal direction, what would one see? My hope is that the "picture" would then resemble the Evolutionary Spiral Diagram, as presented in Diagram XIV. I am indebted to a former student, Mr. Donald C. Hewitt, for making this diagram for me.

The interesting thing is that this new diagram makes it possible to establish a close harmony between Teilhard de Chardin's *Noosphere*

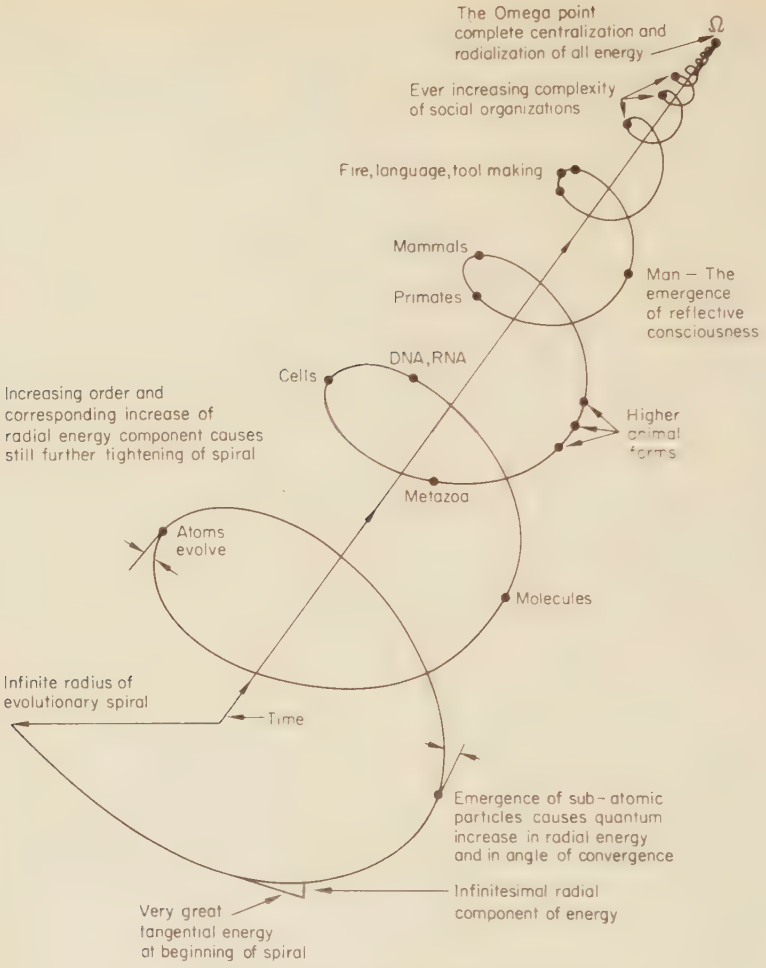


DIAGRAM XIV The Evolutionary Spiral

and my own conception of the *World Sensorium*. In the following chapter I shall develop this idea at greater length in terms of what is termed the *Helium Psychosphere*.

One could form the impression from Teilhard's language that the *Omega Point* is in the far-off distance—the "one far-off divine event toward which the whole creation moves"—and this could leave one profoundly disturbed with the price that mankind has to pay—the sufferings of men in the present world—as we move uncertainly towards that ideal vanishing point. But if the statement ascribed to Alfred North Whitehead is true, that the infinite is immanent in the finite, then the Omega point is in one sense already here—in the

minds of those who live not only in the present but in the distant future.

The attainment of the vision and the goals that have just been outlined is no mean undertaking. Indeed, what we have set out to accomplish is nothing less than the "rebuilding of Solomon's Temple of Wisdom." This is confirmed by our constant reference to the Ezekiel pattern, the reference to the symbolic roles of the "sons of Jacob," the invocation to the twelve configurations of the Zodiac, the characterizations of these duodecimal archetypes with the twelve notes of the chromatic scale and their role in the genesis of a "spherical music"—all this points to an emerging Temple far more vast than Jerusalem could contain. But before we sketch the outlines of the Temple we are now striving to envisage and eventually create, let us return to Solomon's Temple as a precursor of the global Temple wherein our planetary music will be composed, played, and enjoyed.

VI. THE REBUILDING OF SOLOMON'S TEMPLE

> **Wisdom hath builded her house. She has hewn out her seven pillars**

The above line (from the "Proverbs of Solomon"), calls attention to the fact that if there is any one thing that the world needs more than anything else, it is wisdom. And what is wisdom? Wisdom is knowledge focused into unitary insight and synoptic vision—knowledge utilized for the purpose of guiding the course of conscious evolution. Wisdom is knowledge that has been unified, socialized and humanized, for the goals of personal fulfillment and social development.

As it is now, mankind is being buried under mountains of knowledge—facts, laws, and informational data—which our "knowledge factories" are piling higher and higher with each passing decade. Our modern scientific establishments and institutions of higher learning are entombing themselves, and the rest of us, in dark and meaningless catacombs of learning. What we now require—and that most urgently—is a vast program for the integration of this knowledge into the form of unity, a new Solomon's Temple of Wisdom. The philosophy of Cosmic Humanism is one of the movements today making a sustained effort at the building of this neotypal structure.

It is interesting to note the hold that this concept of the Temple has had in the history of Western thought. Why—over the millennia—has Solomon's Temple remained a captivating picture, visionary dream—and also a symbol of frustration? Let us see.

Solomon himself was a fascinating figure. He was represented to be the wisest among men. Son of David, Solomon actually built the Temple, with the help of workmen supplied by Hiram, King of Tyre. But it was Solomon's father, David, who planned it.

Various derivations have been given for the name of Solomon. According to one etymology, the name is associated with the Hebrew *Shelomon*—"his peace." Another rendering is from *Sol-om-on,* the name of the sun as then used in the language of the ancient world. However that may be, it is generally agreed that there was such a person, and that he lived in the tenth century before Christ.

By the time Solomon's Temple was built, Stonehenge had already been constructed—500 years earlier. Despite the lack of cultural or archaeological continuities, these two edifices do have one thing in common, namely, they both are (were) monuments to a megalithic culture. Curiously enough, much later an ancient hallowed rock, mentioned by Ezekiel, became the foundation stone for a Moslem structure, The Dome of the Rock, which still stands in Jerusalem. Thus the architects and masons of the age of Solomon and Hiram builded a structure which still has the potentiality for a synergic reconstruction into an international enterprise dedicated to mankind's thrust toward an ultimate unity of the human family.

In his excellent book, *The Secret Doctrine of Israel,* Mr. A. E. Waite informs us (pp. 137-138) that

> the building plan was sketched by a supernatural hand and was seemingly delivered to David by whom it was shown to Solomon. The Temple was erected on seven pillars the craftsman following the design, point by point, until the work was finished.

Thus, allegedly, there is a sense in which the construction was self-executed, and according to a silent work, of which we learn in the Scripture. This was Jerusalem in its building. The Temple encompassed the Holy of Holies, built on a foundation stone which was identified with the celestial throne of Ezekiel.

The Temple of Solomon was a house of prayer and a symbol of penitence. Its destruction in 586 B.C. by Nebuchadnezzar, when the Jews were forced into exile, signified an impenitent state. Ezekiel's vision of the Temple in no way could prevent this debacle, and the Jews were banished into the Babylonian captivity. Seventy years later the Jews returned to Jerusalem and rebuilt the Temple.

When his disciples were admiring the restored great Temple of Solomon, it was Jesus's ominous prediction that not one stone would be left upon another stone. This prophecy came to pass. In 70 A.D., the Temple, which had been renamed the Temple of Herod, was destroyed by the Romans, this for the last time. And so, today, as with the historic relics of the Glastonbury Zodiac, the remains of

Solomon's Temple—such as the "Wailing Wall"—are but ruins strewn over the earth, reminders of a world that might have been.

Where are the remaining stones to be found today? According to Dr. George M. Lamsa—translator of the *Holy Bible* from the Aramaic into English—the stones of the Temple were removed from Jerusalem and are now to be found in Baalbeck, 100 miles to the north in Lebanon. When, where, why, and by whom they were removed is not known. Some of the stones are of great size and various esotericists have surmised that they could have been made weightless and moved by some anti-gravity force and transported this considerable distance (by "teleportation" to Baalbeck). Perhaps one might just as well bring in the "flying saucers" to do the job?

During the medieval period in Europe the Templars, the Christian Knights and the Crusaders, journeyed to the Holy Land to rescue and reclaim the religious shrines for Christendom. If successful, this might have fulfilled the prophecy of Ezekiel. But the Crusaders for the most part were not successful. And Jerusalem today is still a divided city, and Israel an epitome of a country of conflicts.

VII. THE TEMPLE OF SPHERICAL MUSIC

The two temples we have surveyed thus far—Solomon's Temple and the Temple of Wisdom of the *Integration of Knowledge* program (see Diagram XV)—both suffer from a common limitation, namely, that

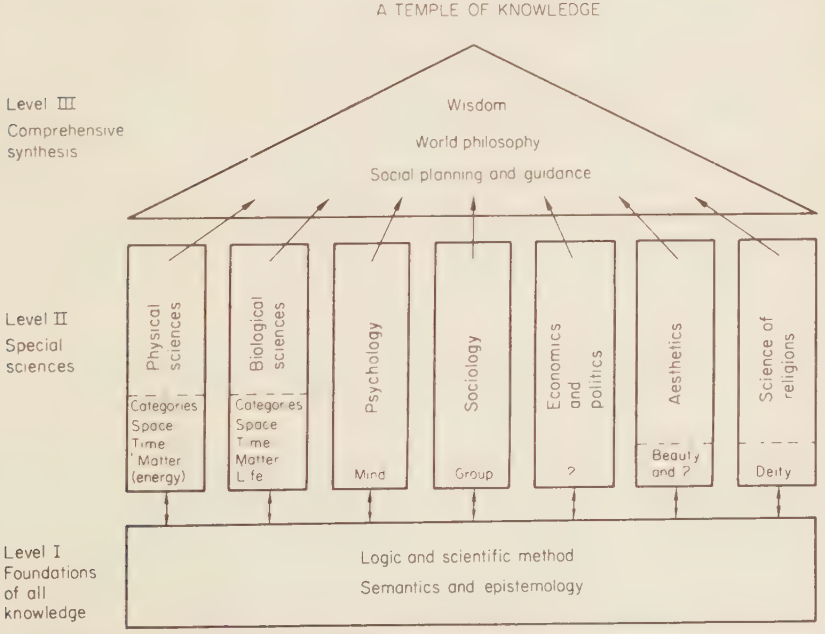


DIAGRAM XV (From The Integration of Human Knowledge, 1958, p.51)

they appear as static structures, with walls made of stones and anchored solidly to the earth. (For a "floor plan" of Solomon's Temple, see Isaac Asimov's *Guide to the Bible*, Volume I, 1968, p. 325.) My own "Temple of Wisdom" is of Greek origin and architecture, and properly so, since the Greeks gave us the content of what in Latin was designated as SCIENCE.

In Mrs. Tipple's *Ezekiel's Pattern* the Jerusalem Temple is termed the "House of the Lord" (see Diagram XI). At first glance, this same static limitation seems also to characterize Mrs. Tipple's version of the Temple—until one suddenly realizes that she is translating the 12 "sons" into the 12 "notes" of the chromatic musical scale, with three sons at each of the four gates of the four Walls. So far as I know, the first attempt to translate Solomon's *Temple* into musical terms was made by the school of Chartres in the 12th century. The designers of this structure were convinced that the basis of musical cosmology was implanted in man's nature by God, so the musical proportions of the Temple were built into the dimensions and proportions of the great Cathedral of Chartres. Something like this conception must have animated Mrs. Tipple in her Ezekiel's Pattern version of the Temple. It is a stroke of genius that leads this neo-Pythagorean creator of a musical variety of "Dynamic symmetry" to convert the city of Jerusalem (more specifically a "key" part of it) into a kind of living harp. This is not an idea that comes easily.

The difficulty with our own project—a celestial temple of wisdom via the Psychosphere—arises from the fact that "spherical music" is one of the arts of *time*, whereas the architecture of a temple built by "masons" is an art of spatial architectonics. What mankind should aspire to is a "Temple" that has a *temporal* character—or better still, represents a space-time embodiment, such as the pilgrim path up the spiral or Tor Hill at Glastonbury. This latter, however, is still a Cretan labyrinth and more like a *mandala* than a melody that is moving toward a resolution of discords.

How can we envisage and construct a "spherical music" that will "house" the Temple of a Cosmic Humanism incarnate the divine and human—in a cybernetic feed-back?

Before attempting to answer, let us glance back into the past and examine whether there are "adumbrations" of "things to come." If so, our design will have historical sanction. Our theme, here, is the magical power of music—its creative power and destructive power. As an example of the destructive power of sound, consider the story of Joshua, who "fit the battle of Jericho"—and won it—when the warriors of Israel marched around the city's walls, blowing their

horns until the walls collapsed and the soldiers could march into the City. So at any rate the story goes.

Next consider music's creative sound. Amphion of Greek mythology, son of Zeus, was a musician. As Apollo is said to have built Troy by music, so Amphion moved the stones of the walls into place to the tune of the lyre's music. Then, much later, we have Tennyson's account in his *Idylls of the King,* where "shadowy Camelot" is pictured as being constructed to the sounds of music!

So the future Temple of Mankind must be a Temple of Music, a most spherical music, with spiral themes of the 12 "sons" (notes) of chromatic harmony—an Ezekiel's pattern transposed to a higher key.

The music of our global temple will come by way of the radiation belts of thought and the nervous systems of human electronic "tubes" of the emerging *World Sensorium.* If this is to be something more than mere science fiction, the Psychospheric-Cortex circuitry we have summoned up to orbit its way around the globe will utilize the pulsing *Psi*--field that links man and the cosmos in a type of resonance-integration (syntropy) that is "out of this world." But that, of course, is as it should be, in a *Cosmic Humanism.* Over the ghostly wires one can even now faintly hear the first chords of a growing symphony of circumglobal music, moving onward to the cadence of a planetary metronome.

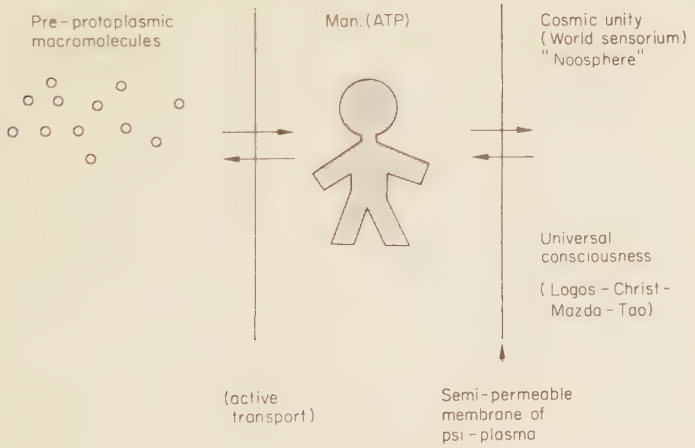


DIAGRAM XVI

PROBLEM: If man today is merely an embryonic nerve cell (or neuroblast) in the emerging World Sensorium, subordinate to the social cortex, how can he retain his personal freedom while he helps to create a more universal consciousness? Is the World Sensorium already in existence? And if so, and if in the mystical experience human beings already have co-consciousness with this cosmic field of energy, where is the "emergence"? This problem can be solved only by way of a multi-dimensional approach.

. . . Perhaps this is the voice of *Gaea,* reporting on her initial broadcast. The radio engineers have put the mystery play of mankind into the form of a Diagram (see Diagram XVI), and their problem now is how to transpose that visual drama into the digital computer music for transmission over the cosmic ether waves. Is *Astroglyphs* equal to the task of cosmic communication?

NOTES AND REFERENCES

1. See Professor Henry Margenau's review of my book, *The Integration of Human Knowledge* (1958), *Journal of Parapsychology,* 23, 1959, 66-68.
2. Quoted from, "Evolution of the Earth's Atmosphere," in the Lloyd V. Berkner Memorial Symposium, *Science,* 157, 1957, 1466.
3. Cf. "Celestial Ammonia," *Scientific American,* 220, 1969 (February), 43-44.
4. Cf. "Geomagnetic Parameters and Psychotic Hospital Admissions," *Nature,* 1963, p. 626, by Doctors Robert O. Becker, *et al.* See also "The Research Frontier," by Doctors R. O. Becker and Charles H. Bachman, *Saturday Review,* Feb. 1962.
5. Cf. "Precession of the Earth as a Cause of Geomagnetism," by W. V. R. Malkus, *Science,* 160, 1968, 259-264.
6. Cf. "Marginalia," by G. E. Hutchinson, *American Scientist,* 33, 1945, p. 56.
7. See the article, "The Fine Structure of the Bacterial Cell and the Possibility of Its Artificial Synthesis," by Ernest G. Pollard, *American Scientist,* 214, 1966 (January), 37-44.
8. See, "The Bacterial Chromosome," by John Cairns, *Scientific American,* 214, 1966 (January); 37-44.
9. Cf. "Metadimensions and Noetics," by Charles Muses, *Journal for the Study of Consciousness,* I (No. 1); Jan.-June, 1968; 29-48.
10. Cf. "Probability, Natural Law, and Emergence," by O. L. Reiser, *Journal of Philosophy,* 23, 1926, 421-434; and, "A Phenomenological Interpretation of Physico-Chemical Configurations and Conscious Structures," *Ibid.,* 24, 1927, 273-284.
11. Cf. "Mind, Matter, and Quanta," by Andrew A. Cochran, *Main Currents in Modern Thought,* 22, 1966, 78-88.
12. Cf. "Light, Wave Mechanics, and Consciousness," by O. L. Reiser, *Journal of Philosophy,* 25, 1928, 309-317.

5

The Helium Psychosphere

I. THE WORLD SENSORIUM AND THE HELIUM LAYER

By this time it is certainly clear that the main drive of my own recent investigations is to provide the outlines of the bipolar theory of human consciousness as an integral part of the theory of the *World Sensorium.* On the negative side, this hypothesis starts from the rejection of what we have termed the "inside the skull" theory of mind as nothing but the physiological basis of human experience. In contemporary literature this view is sometimes termed the "identity" theory.

The impetus behind my own sustained research in this area was, and still is, the urge to formulate a complete theory of human nature—normal and paranormal. As time has passed, this drive has been strengthened by recent social developments—the obvious trend toward total social crisis and collapse. This demoralization is surely related in part to the spiritual vacuum resulting from a zombie technology and the progressive degeneration of the organized religions as instruments of moral guidance. The world needs to find some strong binding forces—human valence bonds—to strengthen and undergird the unitary tendencies, such as they are. The doctrine of "brotherly love" is an empty phrase today, unless and until it is hitched to a new integrative science of "orthosynthesis." To show how this may be done is the aim of the World Sensorium formulation. Let us go over this thesis once more.

The dualism of "mind" and "body," we proposed, is comparable to the duality of "wave systems" and "particles." More specifically, *mind is conceived of as a resonance process involving field*

harmonics, while body is thought of as a relatively stable system of repeating energy patterns ("standing waves"). In this scheme, the macroscopic gestalten of conscious experience emerge from the microscopic cellular constituents, but in turn they live to dominate the subordinate brain wave patterns through an electromagnetic bond of fealty that unites soul and body—for as long as one lives and is an integrated personality.

Behind and beyond all this—according to the theory—is the planetary, possibly cosmic, guiding field, a kind of "radiation belt" called the *Psychosphere.* Accordingly, the god-in-man is nothing other than Cosmic Energy becoming aware of itself. *Cosmecology* is the name reserved for the science of this entire man-earth-solar system-galactic disk configurational unity.

We have also supposed that if, somehow, we can get the breakthrough we need, we might be able to create a kind of laser beam society. Social imagination thus concentrated and focused might generate the psychic field for coherent mental light—the *Caser,* a device for "consciousness amplification by stimulated energy resonance." When man has learned how to fabricate the *Caser,* he will be well on the way to the birthing of the World Sensorium.

The coming synthesis of the World Sensorium can only be achieved through the utilization of the laws of harmonic synthesis—the "power of resonant thought" in mediating the feed-back polarity between human consciousness and the radiation belt to bring into manifestation the reality of the Psychosphere. The term, World Sensorium, refers to the collectively integrated body of brains and minds that can sense the directions of drifting magnetic moments in planetary history and human evolution and supply the morphogenetic guiding or organizing field for man's future development. But please note: this Sensorium is not merely the cortex of an intellectualized world brain—it is also the product and vehicle of the emotional syntony and spiritual aspirations of mankind. This coming synthesis must include the recognition of the role of sex in social integration. Whether the function of the sexual experience in "consciousness expansion" will be that which Dr. Peerbolte describes as the "orgiastic experience of the space-energy of the *Psi*-field" to achieve the *unio mystica* with divinity—or whether some other new and quite different experience and theory are called for, I do not know. In the experiences of some of the great mystics, sex certainly seems to be spiritualized, as if it were at once a prayer and an ecstasy. But if the world of the future is to illustrate a "law of mass action," then the "sex revolution" and the "religious revolution" will arrive together. But in this "alchemical wedding" the sexual and religious experiences must be sublimated and fused, one would think.

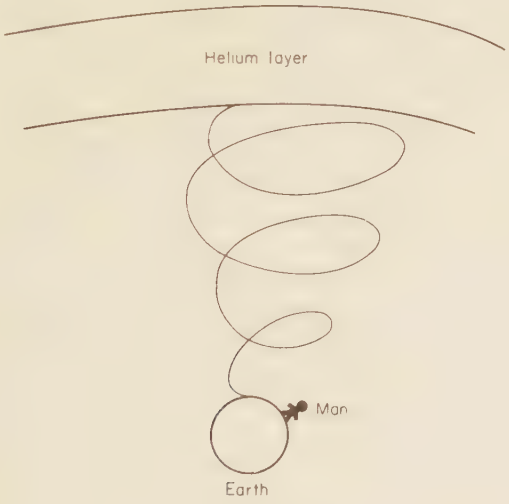
Sex energy is like the nuclear energy locked up inside the atom—if it is not controlled and sublimated, it will destroy man's society.

II. THE HELIUM PSYCHOSPHERE

Now we come to the basic points of the World Sensorium model. How is syntropy (resonance-integration) between human brains and the Helium Psychosphere established and maintained?

As we have postulated, the "helium layer" supposedly has "mind properties." The human brain layers also have mind properties. Moreover, we know that the "carbon chemistry of consciousness" depends upon amino acid metabolism and *DNA* synthesis. Also, if the helium layer of the World Sensorium is a plasma, a superfluid medium, longitudinal and transverse wave trains (acoustic and electromagnetic waves) are transmitted. But what are the connections between these seemingly diverse phenomena?

The kind of model we have proposed, at least in one form, is pictured as follows:



But if we are to understand this, we must be able to show that the *Psi*-field does in fact spiral down into the brain, perhaps in the form of holographic images (see later) from a higher dimension, to reverberate as activated brain patterns. Something like this is required, if a bipolar theory of the nature of man is to be proliferated in theory and in fact.

III. A BIT OF HISTORY

In the attempt to articulate the model of the bipolar field theory of the origin of human consciousness, the early efforts were directed toward the utilization of the conceptual apparatus of wave mechanics, as this was emerging four decades ago. In the course of these speculations, we always emphasized that the conscious or mental aspect was a manifestation of the "wave" or "field" aspect, and the bodily aspect a phase of the organized particle patterns.[1] In one article the thesis is stated: "Energy the Soul of Matter."

It was only later that this viewpoint was expanded into the doctrine of the "bipolar" theory of the nature of human consciousness, with the location of the external pole still to be identified. Somewhere along the line (after the artificial satellites discovered the "radiation belts" of the *magnetosphere*), it became evident to me that the pole that is complemental to the cortical resonator must be found in a "radiation belt of thought"—a *Psychosphere*—which would be somewhat analogous to the ionosphere as a circumglobal field-layer.

The extension of the theory did not require any serious modification of the original wave mechanical theory of the nature of brain-mind processes (except as the wave theory of matter itself evolved); the new element meant only that one pole, the cerebral cortex, was now conceived to be linked to a resonator *outside* the body. Later this theory was given a slant by Mr. Sleeper, in a form not completely acceptable to me. The *Psi Plasma* of Dr. Andrija Puharich seems closer to my own views.

Still more recently my attention was directed to another and quite similar conception as this was set forth by Mr. A. A. Cochran. As a result of correspondence, it soon was evident that Mr. Cochran and I are in substantial agreement on many points.

My first letter to Mr. Cochran was a request for reprints of his article. He sent me his two published articles in this field,[2] along with a letter which reads as follows:

March 6, 1969

Dear Dr. Reiser:

I am very pleased to learn of your interest in my publications; enclosed are two reprints of my recent articles.

About the *Main Currents* article: I am sorry that I must send you a marked-up copy, but my supply of this article has been exhausted by requests from various interested people. One of the concepts expressed in this article is that the elementary particles of matter may possess a rudimentary degree of volition, self-activity, or mind, and that the basic features of quantum mechanics may be due to this property of micro-objects. You may be interested to know that this concept has also been proposed by E. E. Witmer (*Am. J. Phys.* 35, 40,

1967), A. Komar (*Phys. Rev.* 126, 365, 1962), J. M. Burgers (*Rev. Mod. Phys.* 35, 145, 1953), and Arnold Brekke (in the enclosed issue of *Main Currents*).

About the *Dialectica* article: Although heat capacity data for the solid state are used, the reasoning process is not limited to the solid state. Identical results are obtained by using heat capacity for liquids, except that the data for liquids is less complete (beryllium is missing).

After you have read these articles, I would be greatly honored if you would write me your comments, criticisms, or questions.

Sincerely,

A. A. Cochran

. . . . . .

March 14, 1969

Dear Professor Cochran:

I like your idea of the parallelism between the wave properties of matter and the phenomena of life and consciousness. Indeed, for many years I have also been proposing this analogy as a part of a more general philosophy, as follows:

$$\frac{\text{Soul}}{\text{Body}} = \frac{\text{Field Enery ("wave properties")}}{\text{Matter ("particles")}}$$

Some of this line of thought is developed in my book on *Cosmic Humanism*, and I am sending you a gift copy of this.

Your section in the *Main Currents* article on "superfluids" and the material on liquid helium are of special interest to me. You will notice on the enclosed sketch (Diagram I), that I am postulating that the helium layer that surrounds the earth, 700 miles up (Diagram II), may function as a *Psi*-field (or the "Psychosphere"), precisely because it can serve as a superfluid and therefore transmit longitudinal wave trains ("phonons") and transverse waves. But this pulsing helium superfluid, functioning as the *Psi*-field, faces difficulties: (1) Do we require a bipolar theory of human consciousness, one pole being somewhere "out in space" (i.e., in the Psychosphere, external to the human nervous system of the human organism)? And (2), if so, is the helium layer the necessary and sufficient condition for this second pole? (3) How can the helium layer function as a *Psi*-field, when, to be a "superfluid," it needs to be in a solid or liquid state (helium II), whereas, I suppose, the circumglobal helium layer is a gas?

I don't suppose your own theory requires my postulate (2), and so you don't require (1) either? I use your helium example for your purposes *and for mine and yours both!*

So my question is this: do you see any way to support and make plausible the theory I present, i.e., using the circumglobal helium layer as a kind of pulsing resonator for brain influences or fields ("waves"), such as the alpha rhythm or other frequencies? In trying to work out a theory, I want to provide a place for parapsychological phenomena. Do you have any such motivation?

Sincerely,

O. L. Reiser

. . . . . .

March 20, 1969

COCHRAN TO REISER

Thank you for sending me a copy of *Cosmic Humanism.* I have read only a few sections, but already can see that it is very interesting and clearly written.

So far I have neglected to study the many recent discoveries about the upper atmosphere of the earth, and therefore I am not very well informed in these matters. However, I agree with you that the hydrogen or helium layers of the upper atmosphere could conceivably exhibit superconductivity. *Even though they are low-pressure gases, they could exist as ionized gases or as a plasma due to radiation from various sources (the solar wind, cosmic rays, Van Allen radiation belts, etc.), and the free electrons might exhibit superconductivity or some other form of mutual organization.* (Italics mine.)

Relative to your concepts of consciousness, I think of hydrogen and helium as being very similar, rather than opposites, for this reason: The zero-point energy of the atom (or particle) is inversely proportional to the mass of the atom. As hydrogen and helium are the lightest of all atoms, they have the largest zero point energies of all the chemical elements. Since zero point energy is a quantum mechanical wave phenomenon that I regard as a measure of the self-energy, volition, life, or mind of the atom, *then H and He have this property to a greater degree than all the rest of the chemical elements.* The electron, which is much lighter, has this property to an even greater degree, and the photon has it to a still greater degree.

I therefore believe, as you seem to, that the electrons and H and He atoms in the upper atmosphere have a relatively high degree of mind (or rather, that their mind-property is relatively predominant). It is possible that this mind is connected in some way to our own conscious minds, as in your bipolar theory of consciousness, but at present I do not see any way to support this theory with concrete evidence. I would be glad to read and comment on the Chapter you mentioned in your letter.

My concepts of mind and matter leave lots of room for possible explanations of parapsychological phenomena, whereas presently accepted theories do not . . . Although I did not have psychic mysteries specifically in mind when I developed my concepts, I am glad that my conceptual scheme is broad enough to include these phenomena.

. . . . . .

March 23, 1969

REISER TO COCHRAN:

Thank you for your letter of March 20, and especially for your helpful comments on my "letter-article." I am pleased that you don't find any positive objections to my thesis about a superdispersive and circumglobal "radiations belt" as one pole of a bipolar circuitry for human consciousness. I don't know of anyone who is presenting such a "far out" theory, and it will take some time to get the idea discussed and accepted.

In my *Cosmic Humanism* (pp. 62-64), there is a discussion of the hydrogen and helium present in our galactic space (you know more about such things than I do). But rereading this and your articles and letters, I begin to wonder: if you are going to attribute "mind properties" to helium plasma, would this commit you to a kind of "divine love" or/and "satanic hate" out in galactic spaces?

Aside from the fact that galactic helium is a gas and not a plasma (is that right?), and so does not subsume under your theory, there is also the possibility that you do *not* include "emotion" among your "mind properties" (or do you?). So I really am not serious about love and hate in the cosmos.

Would you give me permission to quote from your letters in any articles I write?

. . . . . .

At this point I felt the need for some independent judgment, so I consulted a distinguished physicist and philosopher of science (let us call him Professor X), asking for an opinion on the validity of Cochran's hypothesis. In this connection, I enclosed copies of Mr. Cochran's letters to me, along with my replies. Here is an excerpt from Professor X's reply to me.

COMMENT BY PROFESSOR X ON MR. COCHRAN'S IDEAS:

What he (Cochran) says about zero point energy makes no sense whatever unless the potential trough in which the atoms move can be specified. If he has any specific ideas, which his letter is far from suggesting, they had better be published in a physical journal.

Of course, I transmitted this reaction to Mr. Cochran and, in turn, asked Mr. Cochran to give me the benefit of the reply he would make if he were writing to Professor X directly.

. . . . . .

April 8, 1969

COCHRAN TO REISER:

Regarding your most recent letter: A potential trough (or potential well) is simply a way of regarding the forces that hold an atom or electron in a certain position in (for example) an atomic lattice. Such fixed particles oscillate around their position of minimum potential energy, and even at Absolute Zero temperature, they still have some oscillatory energy, called zero-point energy. Why did Professor X regard his objection as important? I think perhaps he regards our speculations as too loose, and he wants to drag us back to calculations of real physical situations. However, even in such calculations, my point still stands.

I will explain: Calculations of zero-point energies of course depend on the nature of the energy well under consideration. Helium does not form chemical compounds, so this particular kind of energy well does not apply. However, for physical situations that do exist, such as the one that you and I were discussing *(charged atoms interacting with the lines of force in the earth's magnetic field)*, H and He have the highest zero-point energies of all chemical elements, because they are the lightest atoms. It is well known that the high zero-point energies of H and He affect their physical properties in the liquid and solid states (such as density, compressibility, and *the superfluidity of He*).

In my conceptual scheme, zero-point energy is more fundamental and important than in presently-accepted concepts. For example, I feel certain that the high zero-point energy of the hydrogen atom plays an important role in

living matter, and that the eventual explanation of hydrogen bonding will involve the high zero-point energy of H in that particular kind of Potential Well.

I have no objection if you want to quote from my letters and articles. I will write you again after I have had a chance to read your manuscript. If that is the strongest objection that Professor X can come up with, then we are indeed on a sound footing.

. . . . . .

April 30, 1969

COCHRAN TO REISER:

I have read with interest the portion of manuscript that you sent me.

I certainly agree with you that further integration of our concepts—scientific and otherwise—is vitally needed. I sympathize with your "hunger for wholiness," and find your bold speculations very interesting and unusual. Many speculations by scientists today are so timid, so bound by tradition or by current fashions in science, that they are sterile. Bold speculations like yours are very desirable, provided only that they are subservient to experimental tests, as all speculations must be.

I agree that one of the important and immediate goals must be to achieve a greater understanding of the individual's unconscious mind. I also like the idea that mind and matter are joined in the living body. Indeed, I feel that they are joined to some degree in all matter.

On pages 85 and 86 of your manuscript you mention that helium II is a superconductor. While it is true that He II has an amazingly high heat conductivity at temperatures slightly below 2·186° Kelvin, the word "superconductor" is ordinarily reserved for substances in which all electrical resistance vanishes. This does not happen in He II, which is usually called a superfluid.

I feel that I am insufficiently informed to judge many parts of your manuscript, but I hope that my comments will be of some slight assistance to you. Thank you for allowing me to read your manuscript.

Sincerely,

A. A. Cochran

. . . . . .

Up to the moment, Mr. Cochran has not indicated how much further we will travel together in our search for synthesis. It will be noted that he does not explicitly adopt my theory of the Helium Psychosphere, even though he does express general sympathy with the undertaking. But it looks as if, from this point on, I am once more "on my own."

However, before leaving Cochran's superb statements, let us lift out a few of the highlights:

1) Resonance, wave predominance, and life-mind properties are related.

2) Wave predominance and resonance are intimately connected.

3) Resonance is important in explaining the nature of hydrogen bonds between atoms.

4) Hydrogen bond resonance is crucial in biophysical systems. This occurs in *DNA* synthesis, so important in the chromosomal building up of living systems. *Ring resonance* as well as *hydrogen bond resonance* is involved in photosynthesis in green plants (chlorophyll reaction), as well as in the red blood cells of mammals. These must all be kept in mind.

Now let us leave our earth habitat for a moment and journey out into the Milky Way galaxy. The conductor of the "trip" is Dr. Andrija Puharich, who contributes this measure of grist for our cosmic mill.

IV. A LOOK THROUGH THE COSMIC LENS

In connection with the "Cosmic Lens" as the optical instrument of the "Cosmic Imagination," Dr. Puharich presents me with what may be a possible verification of the hypothesis. He starts out with his more general thesis that quantized spin states in biophysical systems are the origin of information per se, so that in human beings the signal detection system is to be found at the atomic (not the molecular) level in the hydrogen protons that are suspended in the protein C=O–H–N system (the hydrogen bonding system). In this scheme, therefore, the foundational layer is provided by spin, precession, etc., that is, bodies showing coherence with respect to magnetic moments, orientations, polarizations, and so on.

Following that, Dr. Puharich moves out into the wider external galactic system and observes that 99% of the matter of the cosmos is made up of hydrogen. This hydrogen is fairly evenly distributed throughout our galactic disk, so that in reality we human creatures live in a cosmic hydrogen field. Given this, Dr. Puharich surmises that the quantized spin orientations of the protons of this field and their various states, with geometrical configurations, may—as he puts it—"provide the equivalent of your Lens of the Cosmic Imagination, so that God uses this mechanism to influence events." As Puharich then points out, a critical test of this hypothesis lies in applying these principles to what he terms "astrological phenomenology." (Shades of the Zodiac!)

By way of comment on this fascinating line of thought, I would wish to make several observations. In the first place, it appears to me that in this "divine materialism," Dr. Puharich is not presenting us with an explanation of the "Cosmic Lens," as I have employed this term, but with a "Galactic Lens." But since in our view we have already provided for a Hierarchy of Lenses (so to speak), there could

be more inclusive Lenses in a cosmic dimensional ladder. Of course, the ultimate pinnacle would be "The Lens."

In the second place, it is not yet clear how to relate this hydrogen galactic lens hypothesis to my own Helium-Psychosphere concept. This, of course, is not Puharich's problem. Puharich's galactic lens is not a planetary lens—the World Sensorium of our Cosmic Humanism formulation. True, both hydrogen and helium surround the earth, and it may be that some duality (perhaps even an interaction or/and alchemical interchange) is required to build up the electromagnetic potential for the bipolar relationship we have postulated. So far, this is all highly speculative and more empirical data and theoretical analysis are called for. And that brings us back to the world of organisms.

V. LASERS AND HOLOGRAMS IN BIOLOGY

Unfortunately, it is not clear at this point in our search for the "intent of creation" just what should be the next step in our journey. But somewhere along the line we must bring in the new discoveries concerning "holograms" and the "phonon maser." The latter is based on the principle of producing acoustic waves by agitating certain materials (atoms and molecules) to high frequency sound waves. This has applications in telecommunications, but also—strangely enough—has possible applications in biophysical systems.

Masers and lasers are now quite generally known to the public; the literature is extensive.[3] Light from ordinary sources is a jumble of waves and there is no correlation in them. But laser light is produced by forcing the individual atoms which produce the light to synchronize their radiation so that it has a high degree of space and time coherence. To make a coherent oscillator for the excited atoms, one must enclose the atoms in a resonator and control the phase oscillations through the use of a mirror system. The resulting laser coherence has greatly magnified intensity—enough to cut metals, weld detached retinas, and so on. Laser-armed satellites can also destroy nuclear-armed ballistic missiles. Among the various other uses made possible by laser beams is the interference effects manifest in holography or lensless photography.

So let us now examine these new applications, especially those in biology, as previously mentioned.

According to Dr. Karl H. Pribram,[4] evidence indicates that the brain may exploit the most sophisticated principle of information storage yet known: the principle of the hologram. In the hologram

an interference pattern is created when a beam of laser light is split so that part of it can interact with the portion reflected from an object. When this pattern is illuminated by coherent light, the original image is reconstructed, but the picture (hologram) has the property of 3-dimensionality—a depth perception is reconstructed.

Applied as a theory to the human brain as a hologram device, the "neural holograms" must emerge as images that are reconstructed from the original input via the body's sensor devices (e.g., the eye in vision). One interesting aspect of this interpretation is that a number of pictures can be superimposed on the same layered storage matrix in the brain. Not only is spatial storage possible; but temporal storage also, and this would help explain biological memory. This hierarchical representation of laminated nervous system functions would also free us from some of the limitations of those automata theories that have no satisfactory explanation of the seeming non-isomorphic relations between cortical and conscious sequences of events. (This question of *isomorphism versus homomorphism* is dealt with in my *Integration of Human Knowledge* volume.)

It will be noticed that in the foregoing account *interference* patterns and *laser light* play a role. But one wonders: what sort of mechanism in the brain could play the role of the coherent light source that is needed to make and display the cortical-conscious holograms? Dr. Pribram suggests that perhaps a kind of coherence effect arises from the fact that the retina and the visual cortex are linked by many thousands of fibers arranged in parallel pathways. Another possibility is that perhaps the nerve cells in the visual channel achieve coherence by rhythmic firing. Or it may be that the job is done through a mechanism as yet unimagined.

Let us now assume that the above line of theorizing is on the right track. What, then, are the next steps in the perfection of the Helium Psychosphere hypothesis? Here are the more obvious questions that must be asked and answered:

1) How does one bridge the chasm, or make the transition from, the 3-dimensional holographs in the human cortex to the Helium Psychosphere, some hundreds of miles out in space, though also as near as hands and feet?

2) Does the circumglobal helium layer in fact have the properties of a plasma? In this connection, one needs also to consider whether the term "plasma" and "superfluid" are interchangeable? Superfluidity is a property of a super-conductor, such as is found in lead. If you have a plasma medium, it can serve as the vehicle for laser light; but is this also the case with superconductor metals (solids)?

3) Does the helium plasma—if the earth's layer be that—have the

"mind properties" it must have, if it is to play the role we have assigned to it? This question overlaps the others.

4) If the helium layer is a plasma medium, does the Helium Psychosphere in truth have "mind properties" so that it can and does serve as the outer pole of the bipolar integrate? And what is the mechanism for the circuitry or feed-back loops between the human cortex and the Helium Psychosphere?

5) The tentative explanation of cortical holograms suggested by Dr. Pribram involves the hypothesis about groups of cells in the visual cortex which flash on and off, many times a second, in response to visual stimulation, the resulting field configurations providing the bases for the interference patterns and holograms. Could there be an analogous (homomorphic) mechanism at work in the functioning of the World Sensorium?

So there is no dearth of problems. One can only take more leaps in the dark, hoping to find something usable.

VI. CIRCUITRY: FROM CEREBRAL CORTEX TO PSYCHOSPHERE

There are many facets to the riddle. But we know that the two main terminals of our effort at in-depth perception are always the two poles, the cerebral hemispheres and the World Sensorium. It seems that, like the spark that jumps the gap between the poles, we too jump back and forth, from man-brain to world-brain. We can escape this schizoid conflict created by our alternating mental currents as we try, and succeed, in turning the loops of our thinking into a helix, or—better yet—a spiral. This challenge of the macrocosm resembles that which the gene faces on the micro-cosmic level—that of turning the "stacked planes of the *DNA*" (see later) into the double helix. Perhaps the one cannot occur without the other? Such is the thesis of a Cosmic Humanism.

For the present, the most we can do is assemble the painted stones, glass bits, and jewels for an artistic mosaic, still to be brought to light to "stain the white radiance of eternity." For my part, the task is one of assembling the pieces, piling them high in a heap, and tinkering with a few tentative patterns. The completed picture will emerge only as we human beings, who are the magic stones of the celestial counterpart of Solomon's Temple of Wisdom, will take our places in the time and space binding synthesis. But as of now, there are no "place cards." We are like photographic artists trying in our imaginations to develop the latent image of the "original"—when it isn't there.

Nevertheless, as we play with the stones in our groping efforts at a creative vision, we occasionally do get glimpses of flickering phantom patterns. Thus, in connection with Mrs. Tipple's imaginary Ezekiel's pattern (see Chapter IV, Diagram XI), my first guess was that much of this was fantasy. But now I discover that the association of the four rows (three sons each, placed at each of the four walls of Solomon's Temple) was already "foreseen" in *Exodus* (Chapter 28), where the association of the colors of the jewels and the names of the children (Tribes) of Israel is established. Is this one of the "magnetic moments" of history, to be duplicated when the Celestial Temple is birthed in the sky?

Here on the earth, a few of the minor configurations are already emerging. We know that proteins (including nucleoproteins, such as *DNA*) are the elixir of life of protoplasm. We also know—as Cochran observes—that the wave properties of matter are highly predominant in proteins. And as we have also noted, among the elements that are abundant in organic compounds are carbon and hydrogen, *and these have the greatest wave predominance of all elements.* Moreover, as Cochran informs us, it is not by accident that these elements—and most importantly hydrogen—can form the multiple bonds and participate in electron delocalization and transmit conjugation effects. This fact that electron delocalization in bonding ("chemical affinity") rests on a high degree of wave predominance and is a quantum-mechanical wave phenomenon supports the thesis that quantum mechanics is a mathematical description of the dual mind-particle properties of matter.

In his articles, Cochran makes no use of the helium psychosphere concept; though he does consider at some length the properties of helium in his discussions of superfluids, and notes especially the "peculiar" behavior of helium II in "climbing the test tube," which is suggestive of life processes. But Cochran makes no use of the fact—extremely important in my thinking—*that there is a helium layer that surrounds the earth, so that we have here the possible basis for a living, earth-creature organism wherein the mind properties of helium are of supreme and majestic significance.* Why does not Cochran see that in terms of his own ideas, the Helium Psychosphere emerges as a necessary consequence?

Be that as it may, here are a few more painted stones.

VI. ACOUSTIC WAVES, LASER BEAMS, AND MATTER WAVES

The prediction that an intense light from a laser should generate intense acoustic (phonon) waves of high frequency has been verified.

For example, such waves can be generated within quartz and sapphire (more "stones"!). They are created when energy carried by light radiation is partially transferred to mechanical vibrations of the crystal lattice.

But why is this jewel (crystal) important for our thesis, if it is? We need the light-sound synergy in our Psychosphere layer or field. But can a "crystal lattice" be a physical basis "out there" in the ionized gases (plasmas)? True, the *interference patterns* arising from crystals have utility in holography, but how in heaven's name can our World Sensorium function like a "crystal lattice"?

Coherent Matter Waves

In the literature,[5] we learn that "there is a basic similarity between the superconductivity observed in certain metals near absolute zero and the superconductivity that occurs in liquid helium below 2·19 degrees Kelvin." Superfluidity represents the frictionless flow of electric charge; superfluidity represents the frictionless flow of *matter waves,* which are postulated by quantum mechanics to explain the behavior of matter on the atomic and subatomic scale. Recent theories suggest that in superconducting metals and superfluid helium these matter waves become coherent—"they have the same frequency, amplitude, phase relation and direction." This fits in with the Cochran and Reiser notions, and supports the view pictured in the diagram in *Cosmic Humanism* (page 224).

The next step—and it is a big one—is to get from matter waves on the subatomic and atomic level to the biological level of macromolecules. Most important for us is the suggestion that molecules can become superconductors. A properly designed organic molecule should have as its backbone a long chain of carbon atoms connected by single and double bonds, with side chains occurring periodically. *Such a chain could be a dye commonly used to synthesize photographic plates* (italics mine). Here it is held that

> a superconducting state will arise from an interaction between the positive charges oscillating in the side chains and the electrons moving along the spine of the molecule.

No implications of the sort we are looking for appear in this article. But it is good to know that superconductivity is a possibility in the biological domain. Also, of course, force fields must be taken into account.

There are Lenses and Lenslets

In another article, "Through a Lenslet Brightly" (reference lost), we learn about the optics of three-dimensional imaging techniques made possible by the successful marriage of holography and the laser. This type of photographic optics is known as *lenslet* or *integral*

photography. It requires the use of thousands of small spherical lenses ("lenslets") to produce a three-dimensional image. It employs *incoherent* light (as opposed to the *coherent* light of the laser). These bright spots from the lenslets converge to form integral pictures. For present purposes, the most interesting of the various applications of holography from lenslets is in the domain of plasmas and the surface of cathode ray tubes and moving organisms. But it is not clear what inside-the-organism applications are possible, unless it be by way of the previous suggestion that organic molecules can become "superconductors." In that case, do we need to find a way to make the transition to a "plasma biophysics?" (And we do not here refer to "blood plasma.") We must remember, too, that the holography we discussed earlier (the views of Dr. K. H. Pribram and Dr. H. C. Longuet-Higgins) is based on the use of coherent laser light; it is not incoherent lenslet holography.

Looking around still further, one finds some new stones turning up—precious jewels we didn't know were in the heap—this time in the area of what is known as "field ion microscopy."[6]

As the name implies, with field ion microscopy one can study the locations of atoms in larger organizations. Especially good conditions for viewing such *images* are provided by polarized helium atoms (in a gas), which can be ionized to produce beautiful helium ion images.

These studies are in the domain of the inorganic and I do not know of any suggestions concerning possible biological applications, in organisms here on the earth. Nevertheless, there is that helium out there in space . . . and I wonder . . . if the earth itself is an organism . . .? Could it be that we human beings, in looking longingly out into space, are visualizing a pattern on the screen of an ion field and "developing" the "latent images"—a pattern of cosmic import? But what kind of holographic photography would that be? Man visualizing the goddess *GAEA* into existence?

This, of course, brings one back to the previous example that was mentioned as suitable for organic holography—the dye used in photography. All this only serves to remind us that in this "biological holography" it will be necessary to learn much more about the interrelations between light and protoplasm. We see how much still remains to be understood when the scientists tell us in so many words that "the explanation of the interaction of high energy radiation (cosmic rays, x-rays, ultra-violet light) and living things may well prove to be one of the hardest tasks ever essayed scientifically."[7]

As compared with the Integrator's job today, Hercules really had it easy. But then—come to think of it—he wasn't very bright. Perhaps there is still hope for man.

VII. THE BRIDGE OF SYNTHESIS

In this venture into SYNTHESIS, we have skipped around at a dizzy pace as we have tried to "follow the gleam." This gleam fades away into the heavens, "whence cometh thy help." Unfortunately, many of the connecting spans for the bridge to the helium rainbow in the sky are still missing—or to revert to the other figure of speech, the painted stones for the master configuration in the heavens above don't fall into place.

Of course, some of the early spans for the bridge from mankind to the Psychosphere were provided by phyletic evolution. The evolutionary ladder connects the present to the past; but evolution to date does not project the future of man. He must make his own future—*man-made humans!* Contrary to the neo-Darwinian mechanistic theories, we believe that the course of evolution was guided. The theory of orthosynthesis suggests that the next step is from man, the earthling, to cosmic man, who now prepares for the next leap into the future, the Psychosphere.

Obviously, this next and biggest jump must come by way of some genetic changes in the "hereditary determiners"—and this involves the *DNA-RNA* complementarity, a kind of Yang-Yin duality. The mechanisms at work in *DNA-RNA* synthesis (and all that goes with it in the form of enzymes, "messengers," etc.) are not well understood. The close examination of the double helix reveals that the macromolecules are stacked in planes more or less perpendicular to the long axis of the helix. The components of the genes are like rungs on the helical ladder, with the two chains of the ladder being held together by the hydrogen bonds between the bases.

But it is not clear how "hydrogen bonding," or even "resonance ring bonding," can serve as the vehicles of the *DNA-RNA* protein synthesis that, on our theory, culminates in directed evolution via gene mutations. It is difficult to relate this, as well as the levo-rotary power of organic compounds, to existing field theories in biology. In the past, I have favored the theory of polarized light as the agent of organic synthesis. But perhaps we need more than that—the guiding field influences for a higher dimension, possibly a fifth orthogonal dimension for orthosynthesis of the World Sensorium? Along with this we may feel impelled to adopt a metaphysics of Platonic archetypes in the higher-dimensional Psychosphere, with interference patterns of Archetypal holograms, plus even the galactic background of "astrological phenomenology"—to bring in the suggestion of Dr. Andrija Puharich.

Of course, there are many unsolved problems. One of the more difficult questions is of recent origin, arising from the fact that

astronauts who go to the moon, and perhaps to the other planets later, do not lose their consciousness and sense of identity. So one may ask: do humans really need the earth's circumglobal Psychosphere?

This problem was anticipated and dealt with in *Cosmic Humanism,* and I can do no better than quote the relevant passage:

> But men will not always be 'earth-bound.' The vision of space-men on their way to the moon and the planets—weightless in some cases, free-floating bodies not tied physically or physiologically to the planet may seem to present difficulties for 'planetary radiation belts' ideas about biological evolution on this planet. But perhaps the analogy of man to an ameba floating in a unicellular entity within a wider organism—for example, like hemoglobin in the blood stream (magnetoplasm?) of the solar system and Milky Way galaxy—may obviate any serious problems . . . And do not forget that space travelers will carry their own man devised environments, including artificial centers of gravity for their space ships.

And so, like our astronauts, we persist in our journey into the unknown. Like heliotropism in plants, this is a compulsion. If the future of mankind is up to humans—in part at least—and if the World Sensorium is to be the synthesis produced by the embryonic nerve cells (neuroblasts), must we humans not learn how to proliferate the holograms via the lenses and create the integrated brain wave patterns—"planetary encephalograms," we have termed them in the past—that will develop the "interference patterns" of the Sensorium panopticon. Or perhaps will incoherent light patterns focusing through "human lenslets" develop *man's new image of man?* Perhaps both are required?

Psychospheric synthesis still eludes us. But man is on his way. And as he gropes, explores, and learns, he finds analogies in previous experience. Guided by the Hermetic axiom, "as above, so below," one can move from sphere to sphere, each more inclusive than its predecessor. If the Psychosphere is like a pulsing field subject to influences from the outside, this may generate some sort of "waves" in the environment that encloses the earth-globe. Within this environmental sphere the human embryo swims. Before birth the fetus swims in an amniotic sac that is his closed sea-environment; and after birth the individual finds himself in a closed geophysical-magnetic environment. Then the social-mental environment takes over, and from this the human absorbs the raw materials essential to the development of his individual personality; and as these raw materials (family, religion, school teachings, and other cultural influences) are "assimilated" by his total organism—or "rebelled against," if he is violently "allergic" to ancestral patterns—he develops an ego-structure which, on the emerging psychospheric

(noospheric?) level, is analogous to the bone-level structure of the biospheric level. This is pictured in Diagram XVII.

The problem of spiritual growth is to attune one's self within and consciously link one's self to the auric or psychospheric field without and progressively repolarize and transmute the contents of both fields in the "alternating circuitry loops" we have tried to envisage. When the binding force is extended on the basis of some law of "mass action," a new dynamics is generated that builds up into a directional response ("resonance-integration") toward and into the Psychosphere, and individuals are then "reborn" into the auric-field environment. This would be the real "initiation"—from the intra-uterine level of earth-consciousness to the extra-uterine level of Psychospheric or cosmic consciousness.

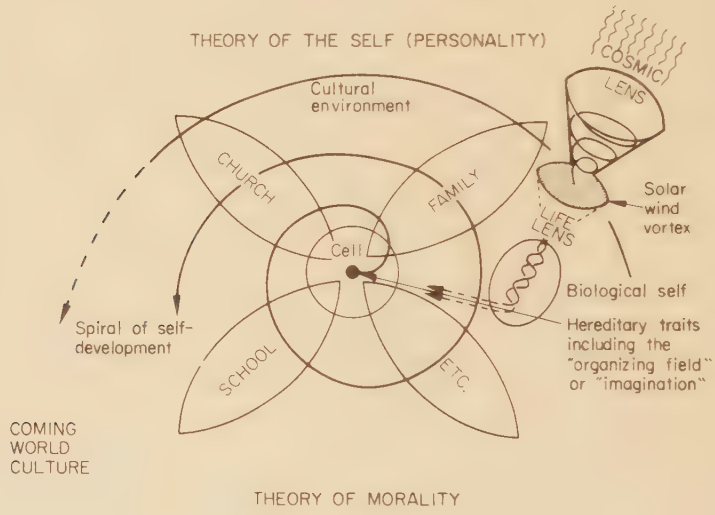


DIAGRAM XVII

M = Motives; C = Consequences; g = good; b = bad

1) Mg Cg = intelligent philanthropy
2) Mg Cb = misguided reformer
3) Mb Cg = unwittingly does good
4) Mb Cb = person intends evil and accomplishes his goal

"The good life is the life inspired by love (good motives) and guided by knowledge (good consequences)."

Bertrand Russell

In working out a satisfactory theory of the Psychosphere, we must not overlook the importance of the earth's interior. This fact has been emphasized by Winifred Babcock in her part of the forthcoming

volume on Preston Harold's philosophy, as this is set forth in *The Single Reality*. In a remarkable paragraph, she puts it thus:

> Oliver Reiser seeks the Psi-belt that surrounds the planet and provides a Psychosphere for the Celestial child. We suggest that the Logos of the planet is where we find the logos of the cell-in the nucleus. In the case of earth, this would be in its liquid core. Here, there may be a plasma with the properties of a super-dispersive medium wherein new types of field influences occur. As the neutrinos move readily through the earth, so thought waves may also. Convergence at the planetary center may create wave patterns that spread outward involving all the layers of the earth's cover, finishing in the outermost reach of earth's magnetic field into a Psi-belt of thought.

The thought here is that the mental wave trains that are propagated in the sub-field may set in motion the plasma of neutrino energy that permeates the earth and this may cause mental light (psychons) to arise in the outermost magnetic field, thus helping to create the Psychosphere. This marriage of "heaven" and "earth" is like the Yang and Yin duality that permeates the Single Reality, and is but another example of "cross action."

But how, more precisely, does this all fit in with our overall electromagnetic theory of the earth organism? Let us recapitulate: We have seen how, in this world-view, the Oriental and Occidental cultures appear as the action-patterns of two halves of the earth-armature spinning out the electronic lines—the proliferating ganglia—of a giant planetary brain. Now let us fit this into the picture of the drifting continents. According to this increasingly popular hypothesis, the present continents were once part of one or two supercontinents that were sundered apart 100 million years ago by forces surfacing from the earth's interior.

The manner in which the fluid core of the earth, with its magnetic properties, participates in the movement of the drifting continents and the periodic reversals of the earth's polarity is still very obscure. But for the other half of the story we may find it useful to return to Winifred Babcock's conjecture that the earth's liquid core is a plasma with the property of superconductivity, so that the neutrinos, moving through the earth, converge toward the "nucleus" to create wave patterns that reach out through field influences through the earth's covers to the very Psychosphere.

That this magnetoelectric dynamics is helping to generate a new level of consciousness is not unreasonable. By hypothesis the continent's drifting apart from one supercontinent (possibly two supercontinents) into the two hemispheres—East and West—would in time make it possible for them to function like two lobes of a world brain. As part of the electrodynamics, the planetary "electro-encephalograms" should begin to function as guiding fields for human evolution—biological, psychological, and eventually spiritual.

That the emerging World Sensorium is indeed the cortex of a planetary brain, and that somehow the Helium Psychosphere must, sooner or later, come into the picture—all this seems quite natural, even very necessary, once one gets accustomed to the idea.

Now, to me, it begins to cohere. Please recall: In earlier chapters we proposed that the precursor for the "planetary encephalograms" of the two cerebral lobes of the World Sensorium (earth's hemispheres) is the make-and break alternating current flow of electromagnetic lines of force that are caused by (or associated with) the geomagnetic reversals of the earth's polarity. As Allan Cox tells the story (Cf. "Geomagnetic Reversals," *Science,* 163, 1969, 237-245), the earth dynamo has a frequency in its alternating field intensity strength, on the average of 20 fluctuations between successive reversals of polarity. What is so surprising is that *the dipole reversals have such a uniform rate of passing through the zero point (from positive to negative), the timing in part being controlled by processes occurring in the fluid core of the earth.*

This entire set of interlocking phenomena is most remarkable. The latter point is especially interesting as making contact with Winifred Babcock's suggestion about the superconductive plasma at the center of the earth, *with its role as the nucleus of the neutrino flux.*

As I look over the entire picture—vague though it be—I get the feeling that what is going on here is something like a game of tennis: balls being batted back and forth between the earth's center and the Helium Psychosphere. But what are the balls? Are they the neutrinos? I know of no reason why, having gone through to the center of the earth, neutrinos should reverse themselves and make a return trip to some outer source—helium (hydrogen?) layer or otherwise. Do they, perhaps, continue on through the earth to issue forth on the other side? The result might be the same in either case—unless on the second alternative, the function of the earth's central plasma is to bend the paths of the neutrinos inward as if by some "pinching" mechanism such as is necessary if man is to make a thermonuclear fusion engine.

And if neutrinos are not reflected back to the Helium Psychosphere, but go off into outer space, would fresh supplies of neutrinos come as free gifts from the reservoir of the Cosmic Field to assist in speeding up the evolution of consciousness in the living creatures of the earth? In that case, what goes on looks like a Cosmic Communion Service? Or is it more like the singing of a "heavenly" love song? Could it be that GAEA, *Mother Earth,* and Uranus, *Father Sky,* are making love to each other? If so, the morphogenetic task of the two parents is to cybernate the spiral movement of the "double

helix" toward the planetarily polarized objective of all global history—the birth and the maturation of the "celestial child."

This means—in less romantic terms—that it becomes more urgent than ever that we come up with the answers to the nagging problems that bite into our minds as we contemplate the helium plasma Psychosphere in which that mind supposedly is immersed.

VIII. THE PSYCHOSPHERE: FANTASY OR REALITY?

All this speculation about a courtship and marriage makes sense only on the assumption that these alleged philanderings can be legalized according to the canons of scientific methodology. But look at the obstacles!

The fact that—as others have noted—there is a "bewildering variety of waves that can be propagated in plasma" is both a basis for hope and a potential source of confusion. The theoretical explanation of superfluid liquid helium by way of the "quasi-particle" concept promises ultimately a satisfactory hypothesis. But aside from that, we have our own self-generated riddles.

In the first place, a fully ionized plasma is a fourth state of matter. This means that the passage from the gaseous state to the plasma state involves a large amount of energy—higher than that required by the transition from the solid to the liquid and from the liquid to the gas. One of our problems, therefore, is whether there is sufficient energy available to create and sustain the transition to the fourth state. If so, what is the source of this energy? Could it be the sun?

In the second place, we must inquire: does the helium layer have the necessary density and temperature to act as a plasma with the required superfluid and superconductive properties? The concentration of helium and atomic hydrogen in the earth's upper atmosphere is low. But while there is a low density of the gases, the temperature generally is high, though quite variable, being influenced by the earth's magnetic field and photoionization due to the sun.[8]

A third problem with the Psychosphere idea is that there is great difficulty for radiation to pass into the plasma from the outside, and conversely, the same mechanism also prevents radiation from emerging from within.[9] But some such "inter-penetration" seems called for in our hypothesis.

Of course, one might say, flippantly, "but Helium II already has such remarkable properties that this presents no impenetrable barrier to the flow of influence from the mind properties of the planetary helium cortex to the human cerebral cortex." And it may also be helpful to recall that while in the shape of a torus or doughnut the

magnetic field-lines of the plasma are endless so that there is no leakage, it is also true that by passing a laser beam through the plasma, it is made unstable and slow leakage is possible. But how does that help us? Previously we did speculate about the possible role of the *Caser,* but we do not have any clear ideas on how this fits in with the embryogenesis of a World Sensorium. The fact, previously noted, that quantized vortex rings are possible in the superfluidity and superconductivity of Helium II also fits in somewhere. One begins to think that a *cosmic mind* will have to enter as the "organizing field" to act as a *wave-guide* in creating the "matter waves" of the emerging World Brain.

IX. SOME FINAL QUESTIONS

There seems to be a considerable measure of harmony in the ideas of Preston Harold, as set forth in *The Shining Stranger* and *The Single Reality,* Winifred Babcock's interpretations as set forth in her fascinating *Palestinian Mystery Play,* and the present form of *Cosmic Humanism.* But for all who make the patient trek along the road toward the goal of *Synthesis*, there still are many questions to be answered. There is, for example, the recurring problem of the role of the "Christ principle" in mankind's spiritual journey, especially in relation to the other great historical figures who rise like mountain peaks on the horizons of religious evolution. Is there unity on this, and other, topics?

This problem—at least for me—brings us back to the role of the "Cosmic Christ"—a term employed in *Cosmic Humanism* and used by Teilhard de Chardin—in relation to other "avatars," "ethical geniuses," and "prophets," to each other and to mankind. This is not the question of "top priority"; for us the real philosophical problem is broader and deeper than that.

As I understand the thesis of the *Stranger,* the *Christ principle* (substitute *Logos, Yahweh, Mazda, Atman, Tao, Allah,* if you wish) dwells in each person, each individual being an incarnation of it, so that the number of sojourns he has had from the beginning to the present time would indicate whether it is his second, third, or umpteenth incarnation. Jesus was an incarnation, but no more so than the rest of us. In the Hindu tradition, Christ would be the equivalent of Vishnu; Krishna and Jesus would be no more and no less than anyone else, except in their ability to tap the fount of truth in their own *unconscious.* Each of us is the temporary home of the Vishnu-Buddha-Christ principle insofar as our bodies are concerned. We do not know how complete or incomplete consciousness is ("we

are all racing under sealed handicaps"). There could be one iota of something a person knows or does not know, so that to complete his consciousness and realize Man's potential, the most enlightened individual may have to incarnate again to complete the circle of understanding. The "sage" could therefore come again as a "primitive," but he will not have lost what he has gained before—he will carry it along in the inner kingdom.

Obviously the answer we have just given is in terms of the more widely held version of reincarnation. But when we try to translate this into our own concepts of the bipolar theory of the nature of the soul, some readjustments seem called for. In earlier sections we have developed the view that the soul has two parts: 1) a contribution from the cerebral cortex of the Psychosphere, and 2) a contribution from the cerebral cortex of the human being. At death, on this theory, the matter waves (particles) of the organism are dispersed ("dust to dust"), but the group wave system, which is the body's guiding field while the organism is alive, goes back into the Psychosphere. Perhaps the immortal part goes into orbit, as it were, around the earth, as a kind of "ghost wave," until this disembodied wave system joins up again with another matter-wave system, the human fetus and infant provided by the father and mother through the chromosomal *DNA-RNA* complementarity that builds the earthly body.

When I once suggested to a certain lady that perhaps after her bodily death the immortal part of her soul would go into the orbit of an earth-bound helium layer, until this part was ready to descend again and take up habitation in another body, she was not in the least enamored of this prospect. But likes and dislikes may have little to do with the actual facts, whatever they may turn out to be.

It could be that the fact that some persons seem to recall the events of their previous incarnation requires the notion of a single, self-identical soul. But one wonders, could this not perhaps be explained in terms of one's tapping the "akashic records" of Hindu metaphysics? Of course, the indivisible identity soul theory also seems more reasonable as a basis for the doctrine of the "working out of one's *karma*"—"as ye sow, so shall ye reap." But this, too, may be more a matter of a social rather than an individual phenomenon—*social karma.*

In any case, it still is true that for the Harold-Babcock-Reiser synthesis Christ is not absolutely unique in history. As pointed out in *Cosmic Humanism* (p. 416), the birth (rebirth) of Christ is the reincarnation of the love-wisdom principle. The *Christ-in-you* is the "ideal self" of Carl Jung. For us it is the *Avatar of Synthesis.*

But one wonders, what then happens to the "sacraments" of

religion that were incorporated in the institutionalized teachings of the New Testament Patrologists, even though Jesus himself never intended to start a new religion? For example, the *Communion Service?*

The best answer to this question is to recall that Harold's philosophy, as interpreted by its unrivalled expounder in her *Palestinian Mystery Play,* regards Jesus as a symbol of light, a seer, who 2,000 years ago conveyed the teaching that the life-giving principle begins with the ingestion of light—*photosynthesis!* And this, for a *Cosmic Humanism,* is the symbolic meaning of the "Last Supper." The body and blood of light, the "photon," is the food necessary for living matter and mind to assimilate. And if, next, we relate this to the "cosmic love song" mentioned previously we see that this is not so much a love between Mother Earth and Father Sky as it is between the brother beings that mankind represents—each gives of his flesh and blood that another life can express itself in the flesh. This does not mean that there is not a marvelous romance going on between earth and sky. For the *Synthesis,* this is the caress of the Q force as it passes earth—as tender as ever was made in this wondrous musical comedy of life.

Now for the next and final congeries of problems. This surely deserves a separate section.

X. THE MENTAL PATTERN OF COSMON

The reader will have noticed that in her expositions Winifred Babcock, following the *Stranger's* world-view, leans toward *Cosmon* as the name for the Reality that traditionally has been denoted by the name "God." My feeling is that her interpretation is not very different—if at all—from the connotation of the "Cosmic Imagination" as I have defined this term. But all ideas about such profound matters are subject to growth and reinterpretation.

For one thing, there is the danger that the reader will yield to the temptation to read into my terminology a personalistic meaning—more "anthropomorphic" than I have intended—even though it has been stated explicitly that "Imagination" has been generalized beyond its earlier psychological connotation. In this respect, the term *Cosmon* seems more neutral. The tendency to "subjectivize" Imagination has been encouraged by my use of the organismic analogy, as illustrated by the frequently employed term, *World Creature,* and similar language. Let us clarify this, if we can.

I think it is correct to say that for the three of us the "Cosmic Whole" is not viewed as an organism in the usual (biological) sense.

The whole of reality is regarded as *living*, and to a degree *conscious* (from proton to gorilla to man, as stated in *TSS*); but this is different from viewing it as an organism. The distinction is not easy to make. Perhaps the best approach is to suggest that the term *living system* be substituted for organism, where this seems right.

Apparently Harold's concept is that the *Cosmon* is more a pattern laid down in nature than an organism operating according to that pattern; or we could say that it is more like mathematics in relation to energy—a description or guide lines. And yet these guide lines plan the life-systems.

In this connection we should think of an aquarium—or the ocean itself—as a *living system*. Neither is a creature in itself. And yet the laws of nature reflect the Cosmic Mental Pattern, laid down in the nature of things. And this—talking in circles—brings us back to the subject of the Cosmic Mind. Clearly Harold did not mean to imply that the Cosmic Mind exists apart from the "Sonons" into which it has been given (for the meaning of this, see *The Single Reality*,). The Cosmic Imagination is not incomplete—it is complete. The Cosmon—to use Mrs. Babcock's terminology—is a pattern of operation, with governing laws and/or possibilities that are laid down in nature and in the mind of man. There is one universal Cosmic Consciousness, but it is not "personal." The inter-relatedness of all things is such that anything whatsoever that happens within the Cosmic Whole is felt throughout the system, just as when we cut a finger, and the finger hurts, the whole being is aware of the injury. Therefore, the principle of balancing applies throughout; the pattern and laws governing the whole set up counter-forces that deal with, alleviate (if necessary), or compensate for (if desirable) whatever happens. These laws, limits, and operations are programmed into universal energy; they are eternally operative. Therefore, the Cosmic Mind is more associated with the inorganic than the organic. The inorganic mind enters into the organic mind as, for example, the synthesis of the two "orders" of energetic expression unite in blood.

Again we appeal to the ocean as an example of a living system: the "mind" of the ocean in its actions and reactions must guide the lives of the fish; but the fish has a creature-mind in which fear and desire and satisfaction operate to some degree. These elements do not enter into the behavior of the encompassing ocean. It is a living system that operates automatically, and does not itself act or react in relation to the hopes and fears of the creatures within it. In overall pattern, it is a perfect environment for aquatic life to continue.

Of course, the major unsolved problem for our own Cosmic Humanism has to do with the mode of operation of the Psychosphere: what bats the psychons back and forth, if that is the

route? Could it be that the integrating force of the planet is "summed" at the center, and this force repels the slightly positive neutrinos which convey the psychons and this sends them outward to the point where they reach the field of the positive force of space and that sends them inward again?

This, of course, is thinking in terms of *The Single Reality* world view. The problems here are difficult to think through. Perhaps it is even possible that when we humans send our thoughts "outward," the shortest path ("geodesic") they can take is "inward"—through the earth—and since the earth is always revolving on its axis, the only "still" point is at the center of gravity in the inner plasma core, and thought-waves take their bearing from this point. In that case the *World Sensorium* has its nucleus at the earth's center. Doubtless, the entire system, from the outermost plasma layers, including the magnetosphere and the solar winds, to the inner core, and everything in between, is involved in the evolution of life on the earth and the growing expansion of inner consciousness among humans. Perhaps the galactic disk also enters in, as indeed we have proposed in our "cosmecology" hypothesis.

The reference to "system" reminds us that there is a limit to what a system can explicate and make "rational." The work of Kurt Gödel has taught us this.[10] This is especially the case when we find ourselves immersed in the problems of the Infinite, with all the problems of the "theory of aggregates." We cannot escape such issues when we try to bring Divinity into the picture. There is a point at which our present human logic fails us.

If the Cosmic Humanist calls *Cosmon* ("God") infinite, he may fall back on Harold's characterization of infinite as "more than can be comprehended in Homo sapiens' generation." God is the primordial cosmic energy spent or fixed in space. As a whole, which cannot be increased or decreased, God is transcendent. The Whole is undivided containment of that which exists. A complete containment represents a whole which has not and cannot be divided, because, being all, there is nothing to disturb it from an outside way. Human activity is subjective in relation to it as the Whole. A part may be in the Whole, but the Whole is more than any, or the sum, of its parts.

Therefore we recognize a place in the Cosmic Imagination for the independent mental *pattern* that conceived of self-division into wholes resembling the originator, but not isomorphic with the originator, because the original source would have to be reorganized to permit this.

Although Harold proposes that the Cosmon is God, whole and indivisible, a mental pattern or living system which cannot be

conceived of in terms of human life or a living organism, he does suggest that the measure of God which each person enfolds involves God as a living entity within him. In this sense God lives in human terms:

> within each person the God-seed enfolding the power, glory, grace of One-Parent-Being is to him as loving Father . . . entirely involved in his life, personal to him, perfect in understanding, sufficient unto his every need, insuring his growth, his *humanity*, and his ability to communicate with itself, Himself, and humankind through expression of word-power. (*TSS*, p. 394).

Therefore, Harold's is a trinitarian concept of God: *Holy Spirit* (Cosmon and universal energy operating within its pattern), *Father* (God-cell within each human being), *Son* (the Yahweh-Christ-Vishnu-Mazda-Buddha-Allah principle), which operates as God-consciousness in each person. God, therefore, is the living system within which God-life operates.

There is something uniquely symbolic in the "seamless robe"—the house of the whole idea—that tries to convey the mystery of wholeness or the unbroken unity of a Cosmic Being, whatever its inner divisions. The whole face of the ocean is rippling with waves, and yet the face is a containment of them which is greater than any wave-group operating upon it. So God—or Cosmon—or the Cosmic Imagination—is an attempt to express the inexpressible. And that is the secret of the undivided whole—it cannot be told—it cannot be shared. But it must be there. That is the mystery of the Cosmos.

NOTES AND REFERENCES

1. See the articles, "Light, Wave Mechanics, and Consciousness," *Journal of Philosophy*, 25, 1928, 309-317; and "Energy the Soul of Matter," by O. L. Reiser, *Journal of Religion*, 12, 1932, 61-79.
2. Cf. "Life and the Wave Properties of Matter," by Andrew A. Cochran, *Dialectica*, 19, 1965, 290-312; and "Mind, Matter, and Quanta," *Main Currents in Modern Thought*, 22, 1966, 79-88.
3. See for example, "Production of Coherent Radiation by Atoms and Molecules," by Charles H. Townes, *Science*, 149, 1965, 832-840; and "Lasers," by A. L. Schawlow, *Science*, 149, 1965, 13-22.
4. Cf. "Neurophysiology of Remembering," by Karl H. Pribram, *Scientific American*, 220, 1969 (May), p. 73.
5. See the Editorial, "Coherent Matter Waves," *Scientific American*, 212, 1965, (June), p. 61.
6. Cf. "Field Ion Microscopy," by Erwin W. Muller, *Science*, 149, 1965, 591–601.
7. Cf. "The Biological Action of Ionizing Radiation," by Ernest C. Pollard, *American Scientist*, 57, 1969, 206-236.
8. Cf. "Temperature and the Earth's Upper Atmosphere," by J. C. G. Walker and N. W. Spencer, *Science*, 162, 1968, 1437-1442.
9. Cf. "Plasma Physics," by Sanford C. Brown, *American Scientist*, 50, 1962 (March), p. 59.

10. Kurt Gödel's theorem is one of the great formulations of modern logic and mathematics. Its philosophical implications are developed in my book, *The Integration of Human Knowledge* (see Index). The relevant portions of this exposition were written by Dr. Beatrice Bruteau when she was a graduate student at the University of Pittsburgh. See also, "Gödel's Proof," by Ernest Nagel and James R. Newman, *Scientific American,* 194, 1956, pp. 106 ff.

6

Cosmic Humanism and the "Space Age"

I. MAN'S VOYAGE INTO SPACE

It is generally agreed that the astronauts' first journey to the moon was the most dramatic single event in mankind's history. Now that humans have landed there and are exploring it—and perhaps other celestial bodies later on—one feels that we need a new term to describe what formerly, in colorless language, was termed the "space age." The earlier "space" labels no longer seem suitable. Much more is unfolding than "space exploration." Something numinous is in the making, or can be, if man's inner vision is equal to the sweep of the expanding outer horizon.

Of all the terms that have been suggested, the name "cosmic humanism" strikes me as the most suitable description of this new universe-in-the-making. Perhaps this is so obvious to me because the term compresses an entire philosophy—as Charles Francis Potter pointed out when he labelled the philosophy and religion of Dr. Albert Einstein as *Cosmic Humanism.*

It is not necessary at this point to propose a definition of the term as we have adapted it to our own world-view in the present volume. As a part of a description of the philosophy it will be noted that it is committed to the belief in a universe everlastingly able to generate and support life and consciousness. To those who have followed the recent discussions of life and entropy, it will be clear that cosmic humanism regards the second law of thermodynamics (increase of *entropy*) as only half the story. The cosmos is not "running down" to a dead level (*wärmetod*) where there is "nothing doing" because all the available energy has been dissipated; on the contrary, the path

of emergent evolution represents a "running up" (a *negentropy*) wherein more complex integrates are synthesized.

Life on our planet, therefore, is not a chance episode on one of the smallest specks of cosmic matter; life and consciousness are inherent in the nature of things. In this sense cosmic humanism is anti-materialistic.

Of course, the word, "materialism" is vague; so let us give it a more precise connotation. One of the most succinct statements of this philosophy—a statement true for ancient Greek Atomism and modern Dialectical Materialism (*Diamat*)—was given by William James, and I quote his passage:

> That is the sting of it, that in the vast drift of the cosmic weather, though many an enchanted cloud-bank floats away, long lingering ere it can be dissolved—even as our world now lingers for our joy—yet when these transient products are gone, nothing, absolutely *nothing* remains, to represent those particular qualities, those elements of preciousness which they have enshrined. Dead and gone are they, gone utterly from the very sphere and room of being. Without an echo; without a memory; without an influence on aught that may come after it, to make it care for similar ideals. This utter final wreck is the essence of scientific materialism as at present understood. The lower and not the higher forces are the eternal forces, or the last surviving forces within the only cycle of evolution which we can definitely see.

This is an elegant statement of a depressing point of view.

But if, on the other hand, this titanic cinerama of evolution is a part of something else, something not yet revealed, it may appear—as the story unfolds in the next chapters—that, as Prof. W. F. G. Swann once put it,

> this material universe constitutes merely the chrysalis from which a very much more beautiful structure has been born, or is to be born, a structure in which the things to be spoken of are of such things as souls, things which have left behind the battles of their birth, and formed a spiritual world where strife no longer is to be found . . . and where death is no longer the inevitable end of the strife.

Now what, according to a cosmic humanism, could be the purpose of the strife of the forces that are the dialectic of creativity? The shortest possible answer is: *the evolution of consciousness.*

But before we expand this idea in more detail, let us epitomize our general viewpoint. We here affirm:

1) the ability of the everlasting cosmos to sustain life unendingly;

2) the uniqueness of man in the biological world as life has evolved on planet earth;

3) the ongoing life of man through purposeful evolution of life toward a complete consciousness;

4) the implicit spiritual unity of mankind resident in the guiding

field behind the sense-perceptible world and the eventual emergence of this unity in the manifest psycho-social world.

5) the high probability of the existence of intelligent life in other planetary systems in the cosmos and the eventual establishment of communication with such entities;

6) the necessity for a more creative approach to the problem of the sexual life of the humankind. The sun and sex will be found to be linked in syntropic relations.

7) the wider and cheaper generation of atomic power for the fabrication of the coming "electromagnetic society" and the harnessing of nuclear energy sources to a global communications satellite system; the exploration of planetary systems; and the attainment of human freedom, leisure and education for moral growth.

Now it is obvious that we cannot consider all these propositions at one time. So let us ponder the first several, as time permits.

The simplest way to compress the content of the present form of Cosmic Humanism is to state that it calls for a new conception of the relation of man to the cosmos. This is especially so, now that man has moved into "outer space"—formerly the celestial abode of the gods. Of course, the entire world was electrified by the telecast journey and landing of men on the moon's surface. As a consequence of this success, there is now much talk about man's journeys to the other planets of our solar system—the "grand tour," as it is called.

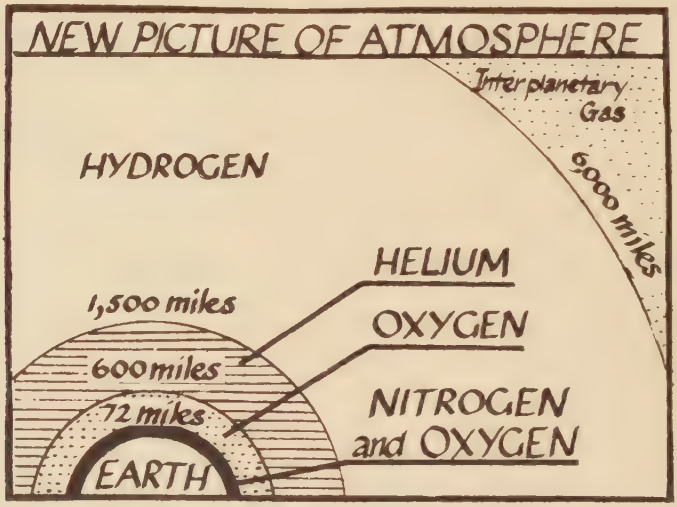
But here a caveat must be registered. The propulsion of human beings into outer space is a waste of time, money, and energy—*so long as the genus Homo remains as we know him today.* This is not even a decent way to get rid of your obnoxious relatives, not to speak of a way of solving the "population explosion" problem.

If an exciting future for mankind requires the extrusion and expulsion of masses of humans, increasingly armed with electronic gear carried aloft in complicated hardware for space probes, with the consequent ceaseless urbanization and mechanization of the moon and the planets of all sidereal systems, then this "age of space conquest" is not what it is cracked up to be.

We humans have confused the priorities. The first goal of man should be to develop the syntropic relations between man and the earth, and the earth and the sun, in a manner that will perfect the configurations of man's mind and brain for resonance with the solar system dynamics. *What I am saying is that the development of human consciousness (as previously mentioned) is toward the evocation of a complete (cosmic) consciousness, thus giving a new lift to the evolution of life on this planet.* In brief, cosmic

consciousness is sun consciousness, and this comes to man by way of the Helium Psychosphere. Helium—the "sun element"—is the vehicle of synthesis. How sex figures in this is still to be revealed to man.

Vague phraseology is being employed in the above description—and vagueness should be frowned upon. So clearly the next job is to give substance and meaning to such nebulous language as the "Helium Psychosphere," "brain resonance ' and the rest, i.e., demonstrate how the "mind properties of the cerebral cortex" and the "mind properties of the circumglobal helium layer" are able to establish a synchronicity or syntony with each other. As noted in *Cosmic Humanism* the helium layer we have in mind appears once again in the following diagram:



THE EARTH AND ITS ENVIRONMENT

Parts of the new knowledge concerning the earth and its interior and exterior environments come from information which is supplied by the artificial satellites circling the earth. The discovery of a 600-mile layer of helium in the upper atmosphere illustrates this. Beyond the helium is a belt of hydrogen, after which comes the interplanetary gas, a plasma called the magnetosphere, and the Van Allen radiation belts.

This is a baffling problem. Fortunately however, there are other starry-eyed dreamers who are attempting to provide help in its solution: Mr. Andrew A. Cochran, Winifred Babcock, and now Mr. John Wester. In response to some discussions we have had, Mr.

Wester summarized his thoughts in this manner:

> My knowledge of the synapse between the "radiation belt of thought" and the biophysical energies of the cerebral cortex is intuitive and incomplete. It is my feeling that in the super-granular layer of the cerebral cortex *RNA* coils and pyramid cells are coupled to make a tank circuit. The *RNA* coil (an 8 stranded molecule shaped like a helix) acts as the coil, and the pyramidal cells act as capacitors. The waves of energy from the *Psi* field moving through the coil produce a current. This current oscillates at a frequency determined by the capacitance of the pyramid cells producing brain waves of different energy levels. Thus the energy from the *Psi* field is transformed. These frequencies moving through the coil allow an expression of our genetic code and if intense enough will cause a mutation. The more the frequencies move through the coil and the greater the range of frequencies that move through the coil determine the rate of our consciousness expansion. And this is determined by the regulation of the capacitance of the pyramid cells by the pituitary and pineal glands. These glands produce an acid which interacts with the electrolytic compound (a base) of the pyramid cells to form a salt and reduce the capacitance. This allows the coils to pick up higher (more cosmic) frequencies, i.e., *interact* with higher frequencies. Sleep or meditation will stimulate the glands to produce the acid. It might be that the glands do not produce the acid directly but rather stimulate the sinuses at the top of the brain to produce the acid. The pyramid cells will take in *LSD* as though it were the body's acid as well as the alkaloids from marijuana, peyote, etc. That may cause, however, the reduction of acid produced by the body.

This is an interesting hypothesis. Unfortunately it is not possible at the present time to test the scientific validity of the ideas set forth. Such terms as "coils," "condensers," and "tank circuits" are radio terms. Therefore, what Mr. Wester is saying is that the *Psi* field (from the earth's radiation belt—my "Helium Psychosphere") is an electromagnetic influence that is picked up by receiving circuits in our bodies, and that these circuits consist of *RNA* coils and pyramid cells.

Up to this point, the formulation is at least coherent. One does wish, however, that Mr. Wester had buttressed his speculations with some real evidence. It is probably true, as J. C. Eccles points out in his volume, *The Neurophysiological Basis of Mind* (1953), that the transmission of impulses in the brain over the synapses, from cell to cell, must be understood in quantum-mechanical terms. But as to the two types of functional processes in the cortex cerebri, via the *RNA* and pyramidal cells, this is still to be established. And the other conjectures, involving the pituitary and pineal glands, the bodily produced acids, and the effects of *LSD* and other drugs—these formulations are not confirmed in terms of our present knowledge.

Aside from the foregoing formulations, one may note also one additional line of thought. A Russian scientist, Dr. E. Parnov (chemist) has speculated about the possible role of neutrinos in

parapsychological phenomena. This leads to the observation that Winifred Babcock and the writer have also supposed that the elusive neutrinos—the "little ones"—have a part to play in this field of the paranormal. An essential part of the argument will appear in the forthcoming volume, *The Palestinian Mystery Play*, by Winifred Babcock. The systematic exposition is an integral part of my own forthcoming book, *This Holyest Erthe*. The nature of the hypothesis is incorporated in Diagram XVIII.

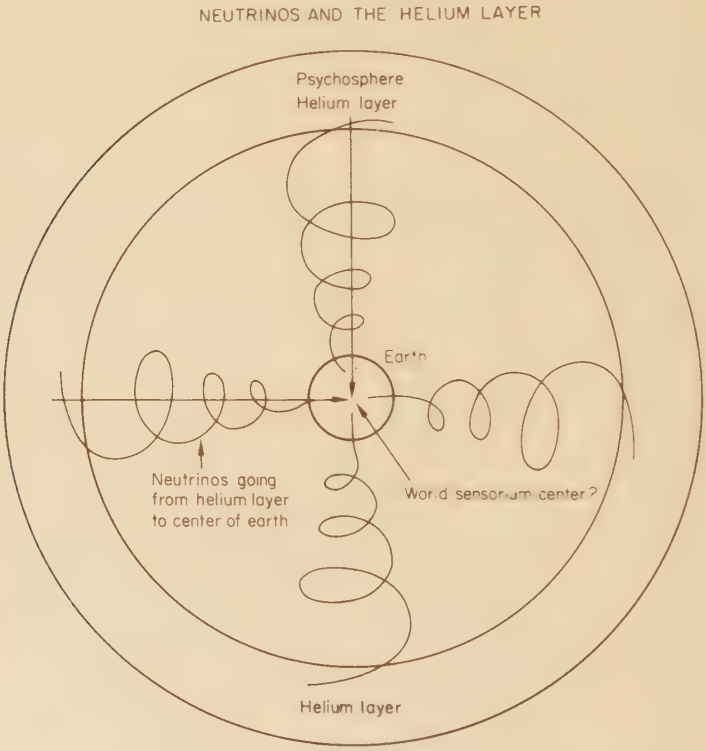


DIAGRAM XVIII

THE AIM OF THIS DIAGRAM: To combine the "mental radiations belts"—the two coil fields of Yang and Yin—of Diagram LIV (p. 465) of *Cosmic Humanism* with the later diagram in the "Helium Psychosphere" (Ch. VI) of the new book manuscript, *Man's Search for Cosmic Meaning*.

PROBLEMS: Why should there be any neutrinos coming from the *Helium Belt* (Psychosphere)? Do the neutrinos come from the sun, through the circumglobal Helium Layer, on their way to the earth? Or is it possible that the hydrogen of the hydrogen layer is transmuted into helium, and in the process neutrinos are emitted? (See *Scientific American* article.)

This kind of alchemy (transmutation) of hydrogen into helium requires more energy than is available? How does Preston Harold's idea about synthesis of helium fit into this scheme?

There are many potentialities and unsolved problems wrapped up in the structure of this diagram. First off, let us glance at one of the major problems.

This is the question: what is it that bats the psychons of the *World Sensorium*, back and forth, from the Helium Layer to the cortex cerebri of the human beings on the earth? Is it that when we send our thoughts "outward," the shortest distance they can take is also "inward"—through the earth? The positive force of the planet is "summed" at the center, but since the earth is always revolving on its axis, the only "fixed" or "still" point is the center of gravity, so that thought waves take their bearing from this point.

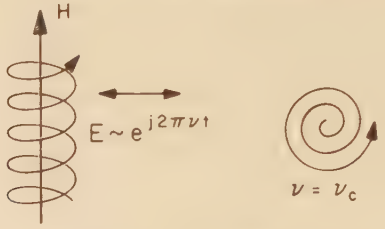
Now according to the theory, the mental pattern is laid down in every neutrino, and Yang-Yin is a good picture of the make-up of the neutrino. Perhaps the neutrinos convey the psychons to the "edge" of the gravitational field and there release them toward the helium layer, while the neutrinos go off on their own courses in space. Therefore, so far as "direction" is concerned, thought waves (psychons) are directionless (or all-directional), for in this scheme it turns out that "up is down and in is out."

This latter goblet of heady stuff is of more recent vintage. It will need to be mixed in with the earlier conception of the earth-dynamo, its geomagnetic field and reversals of polarity reminiscent of the alternating current of the earth armature for the generation of the planetary brain waves ("electroencephalograms") from the two hemispheres or "lobes." To be sure, all this sounds like metaphysical moonshine . . . nevertheless, it is rapidly becoming a sober part of present day science. There are two possible ways in which the neutrinos—as messengers of the *Psi*-field—could move toward the earth's center: (1) the neutrinos issue from the sun (this is established) and penetrate the helium and hydrogen and other circumglobal layers and then penetrate the earth. Physically this is plausible, since the neutrinos don't interact readily with matter. Or (2), it is possible that the hydrogen atoms in the hydrogen layer surrounding the earth are transmuted into the atoms of the helium layer, at a rate much slower than in the sun because of the lower temperature. This alchemy of *hydrogen → helium* has its analogy not only in the sun, but also on or in the earth. My own guess is that (1) is the more likely to prove correct. But need they be mutually exclusive?

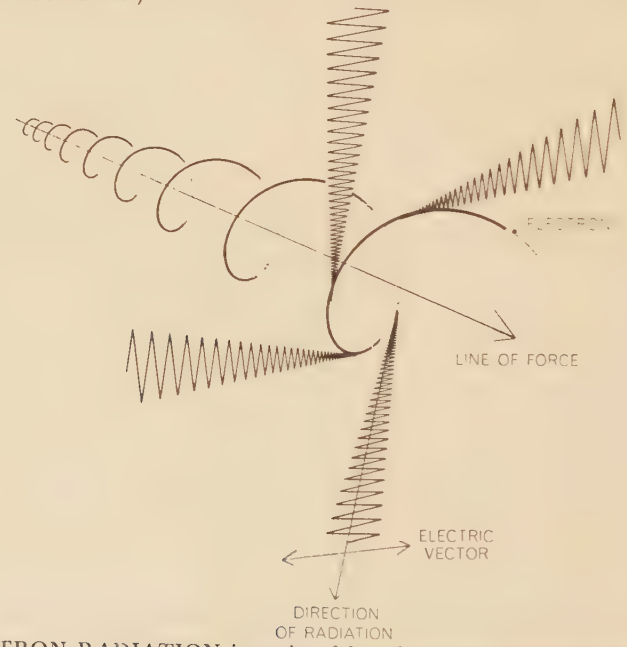
As I look back at the picture of the Helium Psychosphere (Diagram XVIII), I am reminded of the diagrams the physicists construct to represent *Cyclotron Resonance* and *Synchrotron Radiation* (see Diagram XIX). The discovery of synchrotron

radiation opened the way to the study of cosmic rays as they make their appearance in remote parts of our own spiral galaxy.

CYCLOTRON RESONANCE



The helical motion of the electron (on the left) about a magnetic field H with transverse micro-wave electric field E is shown. On the right side we visualize the spiral motion of electrons in the transverse plane of resonance; that is, the cyclotron frequency is equal to the micro-wave frequency. (These matters are discussed in Benjamin Lax's article, "Cyclotron Resonance," in *Science*, Vol. 134, 1961, 1333–1340.)



SYNCHROTRON RADIATION is emitted by electrons spiraling along a line of force in a magnetic field. The radiation can be in the visible or radio part of the electromagnetic spectrum; the wavelength depends on the velocity of the particle and the strength of the magnetic field. Radiation produced by the synchrotron mechanism is highly polarized, with its electric vector perpendicular to the line of force and to the direction of radiation. It is important to note that although cosmic rays themselves travel on erratic paths from their sources to the earth, they generate electromagnetic radiation that propagates in straight lines.

DIAGRAM XIX Cyclotron and Synchrotron

Just how it can be demonstrated that the principles involved in the above "resonance" and "radiation" may have analogues in the domains of biological and psychological phenomena here on the earth is certainly not at all clear. If we try to work this out in terms of Preston Harold's "particle" theory, we will need to bring in the neutrinos and psychons as part of the wholistic mental resonance between the pulsing circumglobal helium layer and the human cortex. For Harold a "thought wave group" is composed of two neutrinos plus the psychon. This wave group would travel freely through space, since it is not confined to the postulated Q fields.

The next step in the development of a comprehensive theory would seem to require that neutrino-psychon wave groups enter into resonance with the Psychosphere by a process that is comparable to cyclotron resonance. The most that one can hope for here is that the resonance be *analogous* to cyclotron resonance (not identical with it), since the wave frequencies in the two cases surely are not the same. Also, in relation to the chronaxic mental pattern, it must be kept in mind that the production of neutrinos is an essential part of the hydrogen → helium transmutation, in the sun (and around the earth, if the latter alchemy also occurs), and that in all this the neutrinos constitute the "virtual energy" from which units of positive and negative energy packets are produced. But at what stage, and by what precise processes, the supposed Psychosphere-human cortex resonances take place—these are problems.

The situation, however, is not hopeless. We do know that if there is a transmutation of hydrogen into helium (via atomic fusion) between the earth's two circumglobal layers, this could result in the production of neutrinos that go off into space. Of course, such alchemical changes *do* occur *within* the earth (one end-product of radioactive transformation being lead); and we know that the earth's radioactivity must generate helium, which evaporates to the outermost layer of the earth's gases because it is so light and therefore least of all subject to the earth's gravitational attraction. But fusion in the sun of hydrogen atoms to form helium requires some millions of degrees of temperature, and this kind of density and temperature is not available in the earth's outer environment.[1]

There is no question, however, that the transmutation of elements does occur in the earth. The conversion of chlorine into radioactive argon is one example. Again, as radioactive potassium ages, it decays and becomes argon, an inert gas. Thus, by measuring the ratio of the two elements in a rock sample (from the moon, for instance), and knowing the rate at which a particular potassium isotope decays, it is possible to calculate the age of the rock. But these examples, we must admit, are not *synthesis of the more complex elements from*

the simpler, which is the type of alchemy we seem to require for the circumglobal *hydrogen → helium* transmutation. If this type of transmutation were essential—and we stress that *it really is not*, since the sun can supply the needed neutrinos for Psychospheric functioning—we would have to look to other mechanisms in the scientist's repertoire of equipment.

Perhaps all that is available is what was put on exhibit in the preceding Chapter 5, where we played with the concepts of *laser beams* and the *Cosmic Lens* . . . or the "galactic lens," if we fall back upon and utilize Dr. Andrija Puharich's emendation of my theory. Whether such mechanisms as the "beam" and the "lens"—either or both—could operate high above the earth and assist in the hypothecated process (a *deus ex machina* device, if there ever was one) is a matter to be investigated. To my knowledge, the idea that laser beams could function in chemical transmutation processes has never been taken seriously by scientists—at least not for any phenomena that happen in the earth's environmental gases and plasmas. But it is interesting to note that it is proposed that in the galaxy there is a "celestial maser"—this being postulated to explain the polarization of the hydroxyl radical ("mysterium") which astronomers have reported, making itself known in the findings of celestial radio emission.[2] It is claimed that "only some form of maser action can account for both the polarization (of radiation) and the extreme narrowness of the line width."

These advances into new and unexplored fields cannot yield definite answers to our problems—not at the present time. But our own unorthodox ideas do serve to loosen up our conceptual synchro-mesh systems and stimulate secretions of the psychic lubricants. Perhaps, then, if lenses and lasers fail us, can "cyclotron resonance" and/or "synchrotron radiation" come to our rescue? Who can say?

So much for one major problem. Now let us turn to the future possible applications of the Helium Psychosphere conception. Of course, it goes without saying that the Psychosphere can be related to Teilhard de Chardin's *Noosphere* formulation; but that is not our present concern.

Also I am not surprised to find that the implications of this notion are congruent with research in what looked like another and quite different area—the origin of the Glastonbury Zodiac in England and the Celtic-Druid mystery religion which served as the preparation for the later Christian developments, as indicated in my book, *This Holyest Erthe*. But my own interest is not in the orthodox Christianity of the organized churches; rather it is a "Cosmic Christianity" with the "Messiah" being an extra-terrestrial Saoshyant

descending to the earth from the sun-realm. This quite obviously requires some explication.

II. COSMIC CONSCIOUSNESS AND "SERPENT CURRENTS"

The present line of speculation goes back in origin to some tentative gropings in my earlier article, "Building the World Sensorium," which appeared in the British journal, *Systematics,* 4, June, 1966 and which will appear in a revised form in the forthcoming book, *This Holyest Erthe.*

My own vagrant thoughts at that time came about as a result of my contacts with the views of Eduard Schuré. My sources of information in this area were (and still are) limited to my reading in Eduard Schuré's book, *From the Sphynx to Christ;* the summary statements sent me by Blodwen Davies, based on her readings of Schuré's two books, *The Great Initiates* and *Rama and Moses* (neither of which have I had access to); and more recently, some information supplied me by Dr. Arthur A. Moor.

According to Miss Davies (deceased, 1966), Schuré was writing of the war of science versus faith, the eternal versus the present, and so on. He calls this polarity the "current of Christ" and the "current of Lucifer." He talks of these in terms of radiation—the two psychic currents that have always enveloped the earth "like two moving serpents of electricity." According to Schuré, Moses named one of these the current of *Horeb,* a centripetal force with its center in the earth, drawing everything back to the earth, so that it is something like Purgatory.

The other current was called *Iona* by Moses, and it was the centrifugal force of expansion and linked up with the whole Cosmos.

It enables souls to rise again to the sun and to heaven; it is the vehicle for divine influences, and by means of it Christ descended in the form of a dove.

Schuré states that initiates in all ages knew how to enter the current of Iona; the great mass of mankind seldom produces anyone who can do this and so men have rarely left the earth's current of Horeb between incarnations. Christ's ascension opened the Iona spheres to man. He (Schuré) says that the whole meaning of the Christian movement was to teach the way of spiritual resurrection into this centrifugal current. The existence of the etheric body after death was implied in the doctrine of resurrection.

Now, in this connection, comes the following remarkable passage:

There is a queer clue here to the emergence of all these theories of space travel. Even outer space ventures are a projection of this deep-rooted timeless idea of freedom from earth and a coming and going of entities and teachers from other realms of being.

(This is a verbatim quote from Blodwen Davies' letter to me, dated June 27, 1965.)

The point is (Blodwen Davies then writes me):

what can you find out about this term *Iona* from any Jewish scholar? I never heard of it before except in terms of the Island of Iona, where Celtic Christianity flourished for so long . . . where the Culdees survived and the Mysteries. It seems to be a magnetized spot just as Somerset is.

Miss Davies did call attention to one clue concerning Iona, as it appears in Schuré. In his story of the baptism of Christ, he calls the dove—a symbol of light and energy—by the name *Iona,* and avers that this energy became the third person of the Trinity—*Holy Spirit*—or, of course, *Sophia.* It marks the point of reversal from the magnetism of earth to the magnetism of space. The bird symbolism is detachment from earth. According to Blodwen Davies, the "Pulsing Ionosphere" is a notable contribution here . . . "and Horeb and Iona come so close to your own spiral ideas." She adds:

the intertwined spirals or cones are a part of a universal mystery teaching . . . and whether it be Horeb and Iona, or Yang and Yin, are a teaching method deeply ingrained in human consciousness.

Blodwen Davies did not live to learn of the conclusions of Geoffrey Russell concerning the Cretan labyrinth on Tor Hill (Glastonbury), which he considers also a mandala or "teaching device."

When I presented these groping but penetrating thoughts to my friend, Dr. Arthur A. Moor, he wrote me as follows:

Horeb, which in Hebrew means *waste* (according to my concordance and a Bible Dictionary), referred to the whole range of mountains in which Sinai is the chief eminence, and to the desert region around it. It may have been used especially with reference to one of the deep ravines by Sinai, but I do not find evidence of this in the Old Testament.

Iona suggests ions, in modern physics, or the ionosphere, as you suggest; one is also reminded of AION (with Omega) in Greek, referring to an aeon, or eternal, or everlasting. AIΩ as a verb root, also has a meaning (1) to perceive, become aware of, and (2) to breathe, or breathe out (as expire). This suggests emanations, and developing consciousness—but none of these hints may be on the right track. Perhaps the centripetal force, earth-bound, would be called the Current of *Lucifer* by some. One is reminded of Rudolf Steiner's polarity between Lucifer and Ahriman; the Ahriman forces seem ever more materialistic, concrete, while the Lucifer influence is all sweetness and light—but therefore dangerously unrealistic ("off the earth"). Steiner and Schuré met first in 1906, and had many associations thereafter; Marie Steiner (de Severs, before her marriage to Steiner) had translated Schuré's "Children of Lucifer" and had produced it.

It seems clear that "Horeb" and "Iona" in Dr. Moor's etymology can be regarded as parallel to Schuré's use of the terms as related, respectively, to the centripetal and centrifugal forces. It is also evident that as Schuré is using these terms, they refer more obviously

to the "spiritual" world. On the other hand, our own terminology of the "radiations belts," and the like, even when brought into line with the Harold-Babcock neutrino concept and its "in is out" and "up is down" of the global serpentry, is closer to a scientific ("materialistic") world-picture. It is not yet clear how the Schuré-Steiner and Harold-Babcock-Reiser cosmologies can be integrated into a unified cosmology. But I cannot escape the thought that "cosmic consciousness" is in some sense the awareness of the "birth" and "resurrection" of the Christ and that this is related to the descent-ascent of neutrinos in the Psychosphere.

But how this all coheres is not yet clear. We don't know enough to penetrate the veil. The mystical experience must supplement the rational analysis. If men are ever to be united on a spiritual plane, the "new world religion" will of necessity have to be a *scientific mysticism*, and it must be born out of the very raw data of the sciences. Such a religion will never be fully "revealed," for the task of synthesis is always incomplete. Mankind is only at the beginning of a fearful and awesome journey. The biggest undertakings are still ahead of Man.

III. GEOMETRIC ETHERIC LINKS

One of the encouraging things about this adventure is the manner in which comrades-in-ideas contribute suggestions. Recently Dr. David V. Tansley of England sent me a paper on "Geometric Etheric Links." The "etheric geometry," he urges, constitutes the field within which the formative forces in the cosmos must operate.[3] Like the "triangles" of Buckminster Fuller, these geometric fields are the "signature of God."

Tansley is gripped by my suggestion concerning the role of the *DNA-RNA* double helix, this helix being for him, the "supreme archetypal pattern which imprints its design on all levels, from galactic systems to atoms, and to man in between."

In thinking about the "synapses" between the "radiation belt of thought" and the biophysical energies of the cerebral cortex, Dr. Tansley supposes that this may imply that the *Psi*-field *is* the synapse between the radiation belt and the cortical force field. If this be the case, then the *RNA* belongs *outside* the human cerebral cortex, while the DNA would belong *inside* the human brain (to provide the complementarity). Tansley's diagram (based on my own) is as follows:

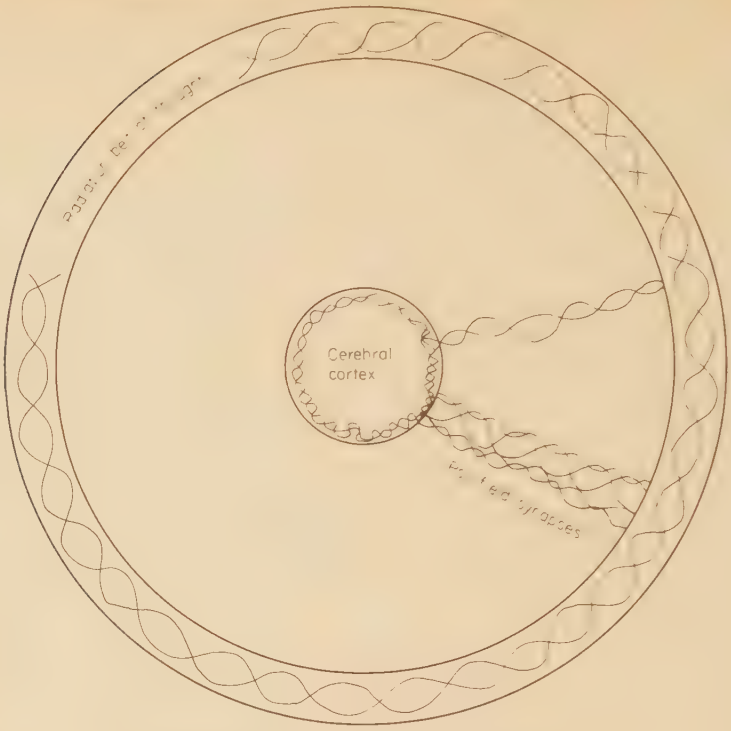


DIAGRAM XX Psychospheric Synapses

For my part, I do not yet see how all this fits together. But what is especially interesting to me is Tansley's comparison of the posture of the "yogi in the bound lotus asana" and the *DNA* helix. He suggests that when a photo of this posture is available,

take note of the way the arms and legs could well be fitted into the vertical and horizontal patterns of the helices.

Perhaps, he surmises, when in this position the yogi hooks into the universal force field and this centralizes the kundalini (the "serpent current") in the physical vehicle for the expansion of consciousness.

Dr. Tansley is willing to extend this analogy to my own picture of the two halves of the earth-armature of our global dynamo as it spins out the electromagnetic lines of force of the Eastern and Western Hemispheres to form the double helix around the earth, as pictured in *Cosmic Humanism* (pp. 461, 465). Given this, the next major problem is how to visualize the flow of psychons-neutrinos as they incurve across the brain lobes of man's cerebral cortex to generate and sustain his consciousness.

When I use the phrase "incurve across the brain lobes," there arises a feeling of familiarity with the language. And when I trace it down, it turns out that this phrase was employed as part of the speculation set forth in my book of 1946, *The World Sensorium*. Since this book is long "out of print," and since the idea still seems to me to constitute an essential part of the total picture, I take the liberty of quoting the relevant passages. On page 218 it is stated:

It will be recalled that we speculated (on page 160) that in the embryonic development of the vertebrate eye the optic stalk develops from the brain itself and grows outward towards the light because the nervous system, which was formed by an infolding of the ectoderm to produce the neural tube, has retained a biological memory of its former environment of radiation, so that the outward folding of the cerebrum, prolonged into the optic cup which reaches the external world, is a result of a "desire" of protoplasm to be stimulated again by the radiant energy (light) to which that protoplasm was originally sensitized. As the biological link from the inner to the outer worlds, forming a kind of bridge for the biological foresight whereby in the course of phylogenetic evolution the organism eventually fulfills its desire to see, we have recommended Kappers' well-known theory that the developing neuroblasts are polarized and grow toward those regions from which the largest number of excitations come: the doctrine of neurobiotaxis.

After a brief digression, the argument then continues (on p. 220) as follows:

Against the dynamic background of the psychic domain of the unconscious, we human beings look out upon the world. The first half of the act of vision arises out of the world pressing in upon the eye-brain system. The last half of the act, following upon the absorption of whatever is taken in, begins with the recording of the energy-plaque, *incurving across the brain lobes*, producing a twisting whirl and energy bursting out against the area surveyed. Perhaps sometimes at this point, by concentration or meditation exercises, the energy flowing out to the point where the right optic tract intersects the left optic tract, there is a torque [analogous to the *cyclotron resonance* or *synchrotron radiation* previously mentioned?] in which some energy is turned into a rising channel, creating the condition which is responsible for a psychic vision. Concentrating on that center between the eyes might have an effect on the point of intersection, and vision might be, in a sense, reversed to provide a condition which makes possible activity in the psychic ether outside the three-dimensional world of Euclidian-Newtonian physics . . ."

This, in briefest form, was my idea of a "psychic eye looking through a psychic ether." Is the idea still "good"?

In actual fact, I think I do see the possibility of integrating this earlier line of thought with the later suggestions of Wester and Tansley. But in turn, all this must eventually be shown to be consonant with the much wider conception of the galaxy as the archetypal pattern for our "cosmobiology" (*Cosmecology*). If, indeed, a galactic maser (or laser) is a functional reality, and if a biological laser beam is (or can become) operative, they—together or

singly—could perhaps serve as the vehicle of the Cosmic Mind *(Cosmon)*, lifting mankind to a new level of synthesis and awareness. In that case, for the first time in history we humans can give credence to the idea: *mind does rule the universe!*

IV. THE LENS OF COSMON AND THE EYE OF GOD

In a passage in the *Integration of Human Knowledge* (p. 339), the following confession of faith appears:

> That there is some deep kinship between cosmic light and human sight; that there is some electromagnetic bond of fealty that unites man and nature; that in some sense the Cosmic Image-forming Lens visualizes the universe into existence; and that man in investigating nature uses light as the link that spans the abyss that separates logic and physics—these are ideas that have haunted me for years, and the working out of a satisfactory theory about them has become an ineradicable philosophical obsession.

This philosophical obsession still holds sway and in fact has become more potent with the passage of time. Some rethinking of earlier themes and reflections on more recent discoveries have confirmed this fixation to the "point of no return."

For one thing, my abiding acceptance of certain aspects of Goethe's theory of vision and color has not wavered. On various occasions I have quoted Goethe's affirmation that "the eye forms itself in order that the light from within may meet the light from without." For Goethe this had a spiritual (metaphorical) application; but for me it was also good evolutionary biology, as was indicated in the lines quoted from *The World Sensorium* in the preceding Section III. Here the invagination-evagination process of embryology was referred to.

In *Cosmic Humanism* this doctrine is related to the view of Meister Eckhart:

> The eye by which I see God is the same as the eye by which God sees me; my eye and God's eye are one and the same thing—one in seeing, one in knowing, and one in loving.

This of course, is pantheism and panpsychism—long a part of the present cosmology. In such a view it is entirely correct to urge that *the Cosmic Lens is the Eye of God, and that when Cosmon looks into the manifest world of physical reality He creates hydrogen atoms in the process.*

We have also pointed out that this kind of "inside-out" cosmology can be made understandable only if we call to our aid the field of geometry that deals with "doughnuts"—or more technically, the properties of toroidal topology. Here the operation known as

circumversion comes into play, as we shall see in a moment. Empirical illustrations of such toroidal structures are provided in physical science by the *stellarator;* also in computer technology where the "magnetic core" employs a doughnut shaped structure which utilizes Faraday's principle of electromagnetic induction (the "right hand rule"). Let us consider several such examples of "doughnutology."

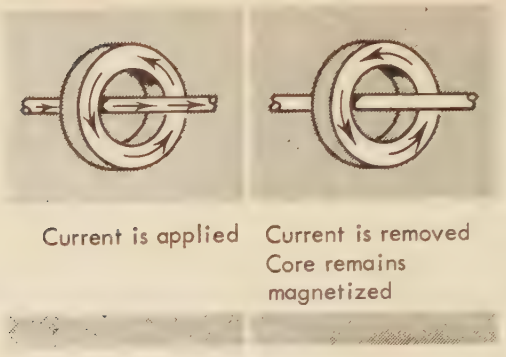
V. "DOUGHNUTS" AND COMPUTERS

The first example of toroids in physics is provided by computer technology. As Professor William H. Desmonde explains in his book, *Computers and their Uses* (1964, pp. 52-53), magnetic cores are frequently employed for the purpose of information storage. The components (cores) are doughnut-shaped devices threaded with two different wires; they are made of ferromagnetic materials and can be magnetized in either of two directions. The time required to store a "bit" of information—ready for retrieval when needed—is only a few millionths of a second.

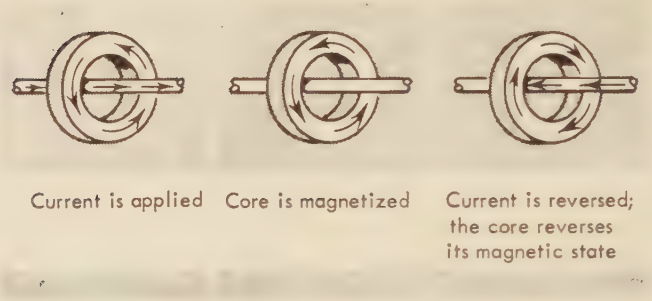
These cores are arranged in a matrix, and the electric current flow through the wires of the matrix determines the manner in which the core is magnetized. By reversing the direction of the current, the magnetic state is changed. Accordingly, the two states can be used to represent 1 or 0, yes or no, on or off, and this becomes the basis for the linear binary system for storing information.

The diagrams representing these core units, shaped like doughnuts (Diagram XXI), exhibit the basis for information storage and the mode of operation of the reversals of polarity of the cores, all of which makes possible the subsequent retrieval of the "stored information."

Perhaps something like this type of mechanism is operative in the brain. Here, by some marvelous and mysterious alchemy, the "language of the brain" is translated into the "language of the mind"—and *vice versa.* Is the protein molecule the "core"? Or possibly do the two strands of the *DNA* helix provide the Yang-Yin, positive-negative, polarity? Here we return to Wester's idea that pyramid cells (or other brain or tissue cells) could act as capacitors, and the helix of the *RNA* molecule could function as an electric coil, and insist that this makes no sense in terms of present orthodox scientific concepts. But if one were thinking analogically, in terms of a supra-cortical ("supramental") energy, rather than cortical energy, this formulation could have validity. Supramental energy, though functioning somewhat differently from electrical energy, could flow



Magnetizing a core



Reversing a core

DIAGRAM XXI The Cores ("Doughnuts") of Computers

freely through each entity (neuron) to induce in each neuron (or possibly *DNA-RNA* couple?) a force with attributes similar in nature and degree to the nature of each lower entity and this homomorphism could supply the pattern for our above postulated transmutation as based on the transformer principle.

The idea that toroidal structures do play a role in biological phenomena is not at all absurd. In his little book, *One Two Infinity* (1953), Dr. George Gamow, while considering the "unusual properties of space"—such as turning right-handed objects into left-handed objects by using Mobius's twisted surfaces—discusses the possibilities of an inside-out universe. His surrealistic picture (p. 65) represents a man walking on the surface of the earth and looking at the stars; and then this picture is transformed topologically so that the earth, sun, and stars are crowded into a narrow channel running through the body of the man, surrounded by his internal organs.

As already mentioned, the topological figure which makes this possible is the doughnut, which has the properties of a torus. Such toroidal figures are extremely interesting.

It has been pointed out that topologically a multicellular animal with an alimentary canal is a *torus*, i.e., one with a ring which does not divide the rest of space into separate parts. But rather than rest the case for our cosmology on the analogical properties of the alimentary canal ("man is a long tube—with one end he praises God and with the other he defiles the earth"), we have found it more elegant to choose the heart-circulatory system as our cosmological model.

In the eight-dimensional cosmology of Cosmic Humanism this inversion requires the "rounding of the curve of dimensionalities" through ascent into the higher dimensions by way of a generalized concept of Mobius's surfaces. And this—to repeat—requires a projective geometry of hyperspaces. As we have seen, the operation of turning a figure inside out is called circumversion. A circumversion in an N-space is possible through a transformation into an $N+1$-space wherein homomorphic images are preserved.

Retracing our steps for a moment, we recall that circumversion plays a dual role in mind in man and mind in the cosmos. In man the mind does not create the brain. This has already been achieved by guided biological evolution. But to understand fully how the mind and the cerebral cortex work together in cybernetic circuitry, we need to know how the organismic patterns make the transition from the 4-dimensional brain mechanisms to the 5-dimensional psychic experiences. The solution to this great riddle—as we have urged—requires that we discover how nature "rounds the curve of dimensionalities" from level to level. And with respect to the problem of the relation of mind to the cosmos, the one scientist who comes closest to the present solution in terms of layers or shells of reality is Professor John R. Wheeler. I shall deal with Professor Wheeler's views in a subsequent discussion.

We see, therefore, that in our cosmology we need this concept of circumversion for two purposes: 1) for the creation of matter out of the cosmic field of energy via the Lens of the Cosmic Imagination; and 2) for the guidance of the biological evolution of the visual eye-brain-hand synthesis so that man could finally emerge and gaze upon and manipulate the outer universe. Thus we confirm Meister Eckhart's formula, though we emend it to read: *the eye by which Cosmon sees me is the same as the eye whereby I see him and the manifest universe.*

This though is not something that emerged suddenly and quite recently. As we have put it in the *Integration* book (p. 153):

Hydrogen atoms are the thoughts of the Cosmic Imagination. The process by means of which man sees the universe is the reverse of the process whereby the universe was created. The world is created through lenses and is seen through lenses.

VI. VISION, IMAGINATION, AND REALITY

This kind of thinking suggests the possibility of a bright future for Cosmic Humanism. But that, of course, is still in the lap of the gods, or—more appropriately—should we say that the future of Cosmic Humanism is a latent image in the eye of the Cosmic Imagination? Whether the "image" will be developed and emerge into the manifest world will depend upon the chemistry of the solution in which it is immersed. And the chemistry, in this case, involves the evolution of the stars and galaxies for the proliferation of man's eye-brain-mind synthesis, so that man may resonate to the Helium Psychosphere that father sun and mother earth have provided.

Another development which has emboldened me to embrace and extend this cosmology is the introduction of new concepts in the field of astronomy and physics. A recent example of this possible break-through in physics is illustrated by Professor Julian Schwinger's search for a magnetic counterpart to the electric charge. If the Nobel Laureate is successful, this will enlarge the quiver of ideas from which scientists and philosophers may draw out and shoot their arrows of thought into cosmic space. Indeed, some decades back Professor Felix Ehrenhaft claimed experimental evidence for a similar thesis that there is not only the recognized force of the magnetic action of electric currents, but a new force, the electric force of magnetic currents. If it were confirmed that there are magnetic forces which flow through the universe, we would have here, along with the magneto-hydrodynamic waves of plasmas ("Alfvēn waves"), a rich assortment of forces for Cosmon to work with as He plays His logarithmic spirals of music upon the galaxy, the solar system, the Helium Psychosphere, and Man.

Parenthetically, we must note in passing that the helium we utilize here on the earth—in the space program, for example, where liquid helium is so essential in rocket propulsion—is not a "child of the sun." It is a radioactive byproduct of the decay of the uranium and thorium in the earth's crust as this is produced over the span of geologic time. Its ancestor in the cosmos is in the helium-rich stars, such as our own sun. Without helium, neither the sun nor man's mind would be possible.

So far as we can now envisage it, the meaning of cosmic evolution is summed up in a message that is simple and clear: celestial optics of the galaxies and psychophysical optics in man are one and the same—in seeing, in knowing, and in loving.

Thus the programming of the cosmic cinerama appears in a light that is completely fantastic and entrancing: Cosmon—the Cosmic Imagination—is asleep in some remote region of space. But when he

awakens, He opens an eye (a cosmic eye) and through His Cosmic Lens "sees" the form of atomic hydrogen as an image in a birthing galaxy, and thereby energy is focalized into discrete structures that then evolve on the rungs of the ladder of emergent evolution—from the simple inorganic to the complex organic forms . . . And when, eventually, Sonon (man) and his solar system habitat die and disappear in the "black hole" of collapsed matter, or perhaps collide with some other system and go up as blasts of radiation, they—man and his resident system—submerge into the timeless Cosmic Field of Energy. But the minute sonon dies to himself, he merges with Cosmon. And again the Supreme Imagination opens His cosmic eye and restarts the creative cycle. Accordingly, Cosmon never dies and sonon eventually comes to see that he is in fact an *idea-image* in the mind of the Cosmic Imagination. This means that the mind of the Supreme Imagination is everlastingly simulating an idea of mind by giving it formed bodies in the manifest world. At this point, however, the cycle of birth and rebirth (*samsara*) seems to become a bit confusing—for sonon no longer is sure that he must always be merely man, and aspires to become Cosmon. But is this not, perhaps, the goal of Cosmic Humanism?

Such is the meaning of man, the avatar of synthesis. The proponents of Cosmic Humanism are everlastingly seeking to carry forward the enterprise of integration, intellectual and social. It is hoped that this world-view may provide a conceptual framework for the wholistic aspiration that is as broad and deep and wide as the name implies. The emerging thought-form for the new age will grow with the human adventure; but there is now a philosophy to which people may turn for a statement of principles that can strengthen their impulses toward world unity and the search for cosmic comprehension.

NOTES AND REFERENCES

1. On these matters see the article, "Neutrinos from the Sun," by John A. Boheall; *Scientific American,* 221, 1969 (July).
2. See the Editorial, "Celestial Maser," *Scientific American,* 214, 1966, January.
3. The literature in the field of the "geometry of ethereal spaces" is sizeable. The little book by George Adams (Kaufmann) was reprinted by the Anthroposophical Press (1965) under the title, *Physical and Ethereal Spaces.* The volume, *The Etheric Formative Forces in Cosmos, Earth and Man,* by Guenther Wachsmuth is obtainable through the Goetheanum, Dornach, Switzerland.

   Much of this work relates to the earlier investigations of Dr. Rudolf Steiner, Howard Hinton, Claude Bragdon, Fritz Kunz, and others. The more

experimental approach is illustrated by the research being done by the de la Warr laboratory in Oxford, England. The more orthodox viewpoint will be found in H. S. M. Coxeter's volume, *Regular Polytopes.* The writer's book, *Cosmic Humanism,* deals with the morphogenetic role of hyperspace forces.

7

Wisdom's Cosmic Temple

I. TOWARD A MASTER SYNTHESIS

WE ARE approaching the end of a long journey. As the "guide" on this "grand tour of the universe," I have come to feel like a multiple personality—sometimes like a "Knight of the Round Table" questing for the *Holy Grail;* sometimes like the legendary "Wandering Jew" seeking the *Promised Land;* and frequently like the "Flying Dutchman," driven relentlessly on an interminable flight over the wide, wide world of all that is.

In the course of our travels we have surveyed the kingdoms of the cosmos, from metagalaxies at the top to elementary particles at the bottom of the ladder of reality, including various strata in between. We have even built a Jacob's ladder to the higher dimensions of being.

The three domains that seemed most likely to possess the keys to unlock the doors of the cosmic mysteries were: (1) the realm of individual galaxies; (2) the domain of mathematics that can teach us how to ascend and descend the helical staircase of dimensionalities; and (3) the kingdom of logarithmic spiralities. This latter labyrinth has led us into the secret chamber of the Ezekiel pattern of music researches, and this, in turn, has required the rebuilding of Solomon's *Temple of Wisdom.* This latter, however, then takes on cosmic proportions and a universal meaning. What this is will, at long last, be revealed in the next and final chapter, where we recapitulate the journey and project the vision as the stars of the celestial sphere rise over the horizon of an emerging cosmic humanism.

Any of the foregoing domains would seem to contain enough mysteries to overwhelm any sensible explorer; but if it turns out that somehow the key to the riddles in any one area has relevance to analogous problems in other areas, we may have a master key to unlock all the gates.

This, we concede, looks a bit fanciful; but tradition does seem to support the possibility of an "open sesame." For example, we find that the ancient and arcane Hindu wisdom teaches that the structure of man has a seven-fold (septenary) constitution, so that if indeed man is a microcosm that mirrors the cosmic pattern (macrocosm), then perhaps what, e.g., Ezekiel "saw" when he had his vision of the "wheels" was nothing other than his *projection* outward of the basic inner structure of an 8-dimensional universe (seven so far as man is concerned). That is to say, in the mystical experience possibly man is resonating to other energy levels of reality, human and cosmic. Perhaps the "wheels" refer to the seven chakras of Oriental yoga; or the seven tones of the musical scale as their archetypes appear in the "Seven Cosmic Notes of Creation"; or the seven colors of the rainbow as these emanate from the Cosmic Lens of White Light and then filter through the prism of human consciousness. In any of these cases we may be vibrating to several levels of the spiral staircase of reality to achieve a kind of "synchronicity" between layers of the laminated structure of man and the cosmos.

If we do in fact discover the key, and if we find that it is the master key that turns seven times, we have before us the real possibility of encompassing a marvelous world-view. But this job of enfolding the master synthesis may be like chasing a chimera that leads us further over and beyond the visible horizon. Time and patience will tell. Let us pursue the ontological Odyssey.

II. THE GENERAL STRUCTURE OF THE GALAXY

Until recent times, it was not possible to think of our spiral galaxy, the "Milky Way,"—of which our own little solar system is a part—as an individual entity. This doubtless was due to the fact that we humans did not realize that we, on earth, were a part of the galaxy, looking outward from within it. The perspective was not right for thinking of our spiral disc as a totality. But now we can imaginatively place ourselves in the position of a super-observer and in a sense look down on what goes on. And what we see is nothing short of majestic.

Galaxies are the most stupendous aggregations of matter that are visible to man. Our own Milky Way has been recognized in the sky for as long as humans have gazed into the heavens at night. However,

the *Via Lactea* was not known to be a "galaxy" until comparatively recent times. Clear ideas about the galactic disc, as it is now known to be, were not possible until Galileo constructed the first practical telescope and resolved the Milky Way into an assemblage of individual stars. But it was not until Thomas Wright (in 1750) proposed that the Milky Way is a flattened disc of stars, and Immanuel Kant and Sir William Herschel supported the notion that our "local system" resembles a lens across which we on earth look toward its remote edge, that modern astronomy began to "tell it like it is."

As one would expect, all sorts of myths and fairy tales have enfolded this magic tapestry, which as Dante put it, "so gleameth white as to set the very sages questing." The best known of the "myths" is, of course, the folklore about the "constellations" or "signs of the Zodiac." Equally wondrous is the Zoroastrian legend concerning the souls of the deceased and departed who journey to the stellar world where they join their astral doubles, their "guardian angels."

With the supplementation of optical telescopes by radio telescopes, man's knowledge about the vast stellar universe has grown immensely. But there still is much about our galaxy, and other external galaxies, that remains to be explored and understood. Needless to say, the interest in astrology as the study of the supposed influences of planetary and zodiacal configurations on human lives is still very much alive and flourishing.

Today we realize that our "local galaxy" is only one of many millions of galaxies. Beyond these, there are meta-galaxies, and these number their constituent galaxies in the billions. The populations of stars, galaxies, and meta-galaxies are scattered out into remote regions of space—perhaps without end. The most distant galaxies so far studied photographically are four billion light years distant.

Some astronomers surmise that the limit of the *observable* universe may not exceed ten billion light years, at which point the receding galaxies in our supposedly "expanding" cosmos, rushing off at a speed which increases with the distance from the earth, attain the velocity of light—so their radiation never reaches the earth, and that is why they can no longer be seen by us.

Until quite recently astronomers believed that the sun was somewhere near the center of our galactic system. Today the astronomers report that the center of our galaxy is more than 25,000 light years distant, in the direction of the constellations (or star clusters) of Sagittarius and Scorpio (these are visible in the southern constellations), though the center of our galaxy itself cannot be seen because of intervening stellar matter. According to the galacto-

centric picture, the earth and its life-system is closer to the outer fringe of our galaxy, as this solar system swims in a universe of millions of stars.

It is known that our galaxy is a semi-spherical aggregate of millions of stars, with the space between the stars being filled with great clouds of dust and gas. This gas—or "cosmoplasma"—is mostly atomic hydrogen. Our galaxy—the Milky Way—is about 100,000 light years in diameter. The disc has a thickness of from 5,000 to 10,000 light years, from the edge to the center.

The spiral rotates majestically on its axis about a center which is screened from our sight. If one were to follow a modernized form of the "nebular hypothesis," the original shapeless cloud of gas, composed mostly of hydrogen, by contraction commences to rotate, and as the speed of rotation increases, the gas forms into the disc with the bulge at the center. The speed of rotation now is roughly once every 200 million years, so that, as George Gamow once calculated, if our stellar system is 3 billion years old, our sun and its family of planets would have made 20 complete rotations around the galactic center. Actually, present estimates place the age of the galaxy as closer to 15 billion years, so that 100 rotations may be closer to the correct estimate. But the peripheral portions of the rotating lens lag behind the revolving core, and this would make some difference in the period of rotation. As already indicated, the center or nucleus of the galaxy is far distant—approximately 30,000 light years away from our system.

The rotating spiral disc has spiral arms that spin out from the center. The streams of materials that spurt out from the core take the form of S-shaped patterns. This is part of what makes the galaxy a "spiral." There are reasons for believing that star formation is more rapid in these spiral arms that spin out from the core. Our own solar system is located about two thirds of the way out in one of the two spiral arms. Something is happening in the core to replenish the hydrogen clouds that are spurted out.

There are magnetic fields that permeate the galaxy. The natural magnetic fields on the earth are rather weak, but apparently in outer space the reverse is true—magnetism increases in importance, and this begins to appear even in the earth's radiation belts (the *magnetoplasm*). The galactic field is not smoothly uniform. Cosmic rays, travelling at a velocity that approximates the speed of light, distort the magnetic field that pervades the galaxy. Formerly it was thought that the magnetic field of our galaxy is the major ordering force that regulates the spiral arms. This view has since been modified, though it still is recognized that such fields do have some influence on the details of their spiral structure.

III. THE GALACTIC HALO

One of the most interesting parts of our galaxy is what is known as the galactic halo. This part of the galactic disc was discovered through the use of synchrotron radiation (see Diagram XIX), the study of fast electrons in large-scale magnetic fields. As will appear later, the plasma that pervades this galactic area is ionized by the photoelectric effect of the stellar light, and this type of radiation shows a high degree of polarization.

One of the supposedly "safe" predictions of the preceding century was that made by Auguste Comte, founder of "Positivism," who asserted positively that no matter how much men might learn in the future, they would never discover the chemical composition of the stars. Today we see how wrong he was—as Positivists usually are. The invention of the spectroscope changed all that. Now we know that the vast bulk of cosmic matter in different galaxies is composed of the same elements—hydrogen and helium—plus some heavier chemical elements. According to some cosmologists, this points to a common origin for the galaxies. But here present knowledge is inadequate to settle the question.

One theory of the origin of the galactic disc is that it was (is) formed by the collapse from the halo. The reverse theory would be that the halo may have originated, early in the history of the galaxy, from a gigantic explosion in the galactic nucleus. One wonders: are these two theories necessarily exclusive of each other? Another possibility is that the nucleus or/and halo may have been formed from a "rain of hydrogen" into the region of the galaxy and the synthesis of hydrogen into helium thus is a focal point for condensation at the center (nucleus).

Whatever the explanation, it must be admitted that whatever it is at the core of the nucleus, or the halo above it, that pumps matter and energy into the disc constitutes one of the great unsolved problems of cosmogony. Whatever the origin or source, the hydrogen nucleus must be replenished somehow, since the nucleus is not drained by the constant flow of hydrogen into the spiral arms of the galaxy. According to Professor Jan H. Oort (*Galaxies and the Universe,* edited by L. Woltjer, 1968), we may be witnessing here an aspect of the formation process of the galaxy which has continued up to the present time.

IV. THE GALAXY AND HYDROGEN

As we have seen, astronomers and cosmogonists are especially puzzled by the high velocity clouds of hydrogen that seem to be

raining down on the galactic disc from outside, then to spurt out into the revolving pinwheel. This phenomenon points up two major problems that confront the astrophysicists: (1) what is the origin of the clouds of hydrogen gas plunging into our Milky Way, apparently from above and below the spiral (though seemingly the clouds are twice as numerous from above as below)? And (2), what is the cause of the movement of the hydrogen flowing out from the core of the galaxy?

With respect to the first problem, Professor Fred Hoyle of Cambridge University (England) recently proposed (cf. *Nature*, Nov. 1, 1969) that matter and antimatter particles are generated in equal amounts in the cores of these galaxies, but our part of the universe is composed of matter while the antimatter remains in the nucleus. This would maintain the symmetry of nature—the balance of matter and antimatter—but it leaves the real mystery unsolved. However, these speculations are still incomplete and may be a part of the total picture when it is complete.

In addition to the theories already mentioned, there is another possibility. This takes us outside our own galaxy into inter-galactic or supra-galactic regions. We have in mind here not the space between the stars of our own galaxy, but the space outside or above the entire galaxy. Here we turn to the indications that there seem to be leaks of cosmic rays and particles from the meta-galaxy that contains our own, and other galaxies. Also some galaxies are connected by bridges of plasma. But we go beyond orthodox ideas in our extensions of this into higher regions, something Sir James H. Jeans once conjectured.

Following up this line of thought, we return to our own speculations about "lenses" in various dimensions (see Diagram VII). We request consideration of the idea that it is in the hierarchy of universes that our own gets its *energy → matter* endowment for our first-level galaxies. This surely is no more incredible than the suggestion of some astrophysicists that a new set of physical laws may be necessary to deal with phenomena at the heart of our spiral disc.

V. SUPERGALAXIES AND HIERARCHICAL STRUCTURE

My own speculations would not only take us outside our own galaxy, and other first-order galaxies, but would also take us into higher dimensionalities. This vast extrapolation of cosmic structuring into super-universes takes us back evermore to the problem we have previously grappled with—the relation between galaxies, meta-

galaxies, and meta-metagalaxies, residing within their own realms of being. Of course, this also raises the ineluctable problem of how we "round the curve of dimensionalities" as we ascend and descend the Jacob's ladder of levels in the hierarchy. I have tried to make a diagram of these systems and supersystems, representing the lower and the higher by diagrammatic inclusions; but my technical skills are not equal to the demands—and so the best that I can do is what is presented in my book, *The Integration of Human Knowledge* (page 354). For the present, this must suffice.

VI. GALACTIC BACKGROUND OF ORGANIC SYNTHESES

One of the amazing things about the composition of the galaxy is the discovery that the "interstellar dust" that fills the space surrounding the nucleus of the galaxy contains earth-like stuff—even organic substances. For example, radio data indicate that ammonia molecules are quite abundant in the turbulent gas clouds in the constellation of Sagittarius, which, as we have noted, is in the direction of the galactic center. And these remarkable findings suggest several possible implications.

In the first place, this discovery probably has some bearing on the time-honored problem of the origin of life. Among the compounds present in the interstellar spaces are "celestial ammonia," previously mentioned, and "embalming fluid" (formaldehyde), both of which float about in the gaseous clouds of the Milky Way. This seems especially interesting when one recalls that biochemists have learned how to manufacture important organic compounds (e.g., amino acids, the building blocks of proteins) by sending electrical charges through substances containing carbon. Simpler chemical substances than those just mentioned, namely water (H_2O) and methane (CH_4), have also been found.[1]

A second possible implication of the foregoing discoveries is that it now seems much more probably the case that there are other planetary systems, similar to our own solar system, with creatures inhabiting them. How highly evolved such beings might be—what their I.Q. is—we have no present way of knowing. If here and there, in other reaches of astral reality, there are other systems containing intelligent beings, then man (Sonon) may eventually learn to communicate with such creatures. In passing, however, one should remember that Giordano Bruno, in his book, *The Infinite Universe and Its Worlds,* warns us that we might not find it profitable to converse with such creatures: modernizing his point, we could perhaps find here the conditions for a cosmic parallel to the "cold war"—or even H.G. Wells' "war between the worlds"!

These foregoing reflections lead us directly into the broader topic of the galactic background of biological evolution here on the earth, and our own "cosmecology" in which the sun acts as the "pace-maker of evolution." But before following up that idea, we must first examine the connections between astrophysics, the Helium Layer, and the terrestrial ionosphere.

VII. PLASMA PHYSICS AND COSMOLOGY

The word "plasma" comes from the Greek word for "matrix." In a general way "plasma" now refers to a gas (though it can also exhibit the properties of a solid), which is in such a state of ionization that it becomes conductive enough to be affected by magnetic fields.

It is clear that the exploration of the nature of extra-terrestrial space of the solar system ("solar winds") and inter-stellar space (the "cosmoplasma"), no less than the interior of the earth, will depend on the progress of plasma physics studies. The astrophysicists have found that there is much more matter in the plasma state than the usual three states of matter ("solids," "liquids," and "gases"). The relative abundance of plasmas may be as high as 99% by weight in the accessible parts of space.

Plasmas have many remarkable characteristics. Among these is the fact that plasmas can be controlled by magnetic fields alone, without the presence of material walls. Indeed, a magnetic field *is* a "wall," since the plasma is constrained to move along such lines of force.

Waves in Plasmas

Let us consider briefly the types of wave phenomena possible in plasmas. It has long been known that the energy that is transmitted through space travels not with the speed of the waves, but with the speed of the group velocity. Here, once more, we come upon the distinction between group waves and velocities and phase waves and velocities.

These two appear in different roles in different physical situations. It is even possible for the phase waves to exceed the velocity of light in a vacuum. Group velocity differs from the phase velocity especially in dispersive media. In an earlier day (1925), Louis de Broglie postulated a phase velocity greater than c (velocity of light *in vacuo*). Among other things, the line of thinking opened up by de Broglie seemed to indicate that the wave theory of light and the wave theory of matter might both be true. But this, of course, is not the end of the story.

In a domain where the "unexpected" is constantly turning up, we

should not be surprised to discover the considerable variety of waves that can be transmitted by plasmas. In plasmas, when an external magnetic field is applied, both longitudinal and transverse waves intermingle and may even interfere with each other; no sharp distinctions can be made between the two types of waves. Indeed, complications of all sorts result from wave interactions where non-linear phenomena occur. Here "whistler hisses," resonance effects, and laser-like phenomena may make their appearance.

The Ionosphere

The ionosphere is a plasma of highly ionized gas, containing a mixture of positive ions and free electrons. Here in this area the distinction between group waves and phase waves comes back into the picture and takes on importance for us earth creatures. The bending of radio waves by the ionosphere which encircles the earth depends on the fact that the phase velocity is increased in the ionosphere.

For us the practically important "medium is the message" lesson is that since the circumglobal medium is out there in space, and since the wave-trains of radiation with group and phase waves are propagated through it, the discrepancy between the two velocities of the two types of waves is responsible for the bending of radiation back toward the surface source. This is why radio waves don't go off into space.

What are called Alfvén waves (magnetohydrodynamic waves) were a novelty at first. In these waves the lines of force are like strings in the magnetic field. Here the motion of the plasma is at right angles to the direction of the wave propagation. Alfvén waves are not possible in the earth's atmosphere below the level of the ionosphere, though below this lower boundary energy can be transmitted by ordinary electromagnetic radiation.

Superlight velocities

Microwaves sent through plasmas may attain a phase velocity greater than c, the speed of light in a vacuum. The increase in velocity is related to the density of the free electrons in the plasma—the greater the concentration the greater the velocity. In general, the group velocity can be less than or equal to the phase velocity; but for small capillary surface waves, the group velocity is greater than the phase velocity.

Some plasmas, at very low temperature—helium for example—become superconductors. In such a state, the plasma is capable of producing and transmitting vortex rings through space. It is not yet understood how these supercurrents may interact with each other.[2]

VIII. MATTER WAVES AND LIGHT

In trying to assemble into understandable form all that we have surveyed, it is necessary, again and again, to turn to the subject of *waves.* In returning to this topic, we will glance at areas previously covered; but new territory will also be opened up. The repetition provides continuity, and the novelties represent the efforts to keep abreast of new developments. In this fashion we move from homely water waves to exotic phonon and Alfvén waves, and beyond that to "psi-waves" of the Psychosphere.

At the outset, let us list the types of waves that the scientists have to deal with.[3] These are:

1) Water waves (surface; capillary).
2) Sound waves in air and other gases.
3) Elastic waves (vibrating strings; ringing bells; earthquakes).
4) Electromagnetic waves (radio; television; radar; light; x-rays).
5) "Matter waves" of de Broglie; Schrödinger; Dirac).
6) Gravitational waves.
7) Magnetohydrodynamic ("Alfvén") waves.
8) Brain waves (Alpha; Kappa; etc).
9) Mass social waves (mass hysteria; social movements; collective hallucinations).
10) Thought waves; *Psi*-radiation.

Fortunately, despite some important differences, several of these physical wave-trains can be handled by the same mathematical equations (e.g., sound and light waves). In the mathematical handling of these situations we employ what is known as the Laplace equation. Here the partial differential equation is:

$$\frac{\partial^2 \phi}{\partial x^2} + \frac{\partial^2 \phi}{\partial y^2} = 0, \tag{1}$$

known as the Laplace equation. The applications embrace gravitation, electricity, magnetism, hydrodynamics, conduction of heat, stream lines, isothermal families, conformal mapping.

In three dimensions, the corresponding equation is

$$\frac{\partial^2 \phi}{\partial x^2} + \frac{\partial^2 \phi}{\partial y^2} + \frac{\partial^2 \phi}{\partial z^2} = 0. \tag{2}$$

The physicist tells us that the differential equation for the steady flow of heat, light, electric waves, and magnetism, where a is the velocity of transmission, is this:

$$\frac{\partial^2 y}{\partial t^2} - a^2 \frac{\partial^2 y}{\partial x^2} = 0. \tag{3}$$

This equation expresses the *orderly* displacement in space, progressing along the time-axis. In all such cases, when the properties of a given differential equation are developed, the results are applicable to heat and light, and in these cases there is a continuous spreading out of the waves from their sources.

As a student of the philosophy of science my original interest in "waves" was in the use of this phenomenon as an example of the "creativity" exhibited by "emergence." This appears in an article as early as 1927, where this is proposed.[4] The example of the water wave emergence was supposed to apply to the novel properties of emergence on some other levels. In such cases the molecules of water as a fluid medium move in one direction—up and down—*and yet the crest of the wave moves forward in a new direction (dimension) horizontally.* In such cases of "emergence," we suppose that each rhythm represents the averaging effect of the overlapping fields of the particles of a statistical ensemble of elements. where there is an integration of molecular fields to produce a macroscopic rhythm. This process whereby particles-in-interaction produce continua in which wave motions occur has been generalized. Since then, the role of field forces—nuclear, atomic, molecular, organic, and super-organic—is something we have always stressed.

For us, in the historical development, the next step was the passage from ordinary water waves and sound waves as "emergents" to the new and surprising unfoldments in what came to be known as "wave mechanics," i.e., the undulatory theory of matter of de Broglie and Schrödinger, as already indicated.

It was here, in seeking to master the wave-theoretical language, that it became necessary to study the types of waves denoted as *group waves* and *constituent (phase)* waves. One source of information was provided by the book by Sir J. J. Thomson, *Beyond the Electron* (1928). From this small volume, I select the following relevant passage as giving a clear idea of the two kinds of waves and their velocities of transmission that are fundamental in this area:

"The velocity at which the disturbance or the energy moves is called the group velocity; the velocity of the waves, the wave velocity. Let me illustrate the difference by a simple example. Take the case when there are two sets of waves, and let us represent one set by a procession of men, walking in a straight line at a

constant speed and with a constant distance between each man and his nearest neighbor: the speed with which they walk represents the wave velocity, the distance between them the wave length. Let the other set of waves be represented by a procession of girls moving at a different speed from the men and separated from each other by a different distance; suppose the two processions are walking side by side. If the men represent the crests of one set of waves, the girls the crests of the other set, then when a man and a girl are together the crests of the two sets coincide and the disturbance and energy are maximum at these places. Let us concentrate our attention on these places and find the velocity with which they travel. If an observer stands still at one place and waits long enough he will see a man and a girl side by side; but since the two processions are out of step the next man that passes will not pass at the same time as the next girl, and it may be a long time before he sees another couple. Could he get a richer harvest by walking forward, and if so, what is the pace at which he ought to walk?"

To answer the question, Sir Joseph enters into a mathematical analysis of the situation (here omitted), and then concludes: "We see from this analogy that though the velocity of the energy may lag far behind that of the waves, the path of the energy will be that of the waves; the waves guide the energy along the path it has to take."

It will be noted that in this situation the greater the velocity of the waves the smaller is that of the energy. The remarkable thing is that the product of the two speeds in electromagnetic phenomena is always the same,—the square of the velocity of light. In other words, *the velocity of light is a mean between the velocity of the group waves and the velocity of the guiding or constituent waves.*

It will be noted that group waves are a resultant of superposed constituent waves. Applying this type of approach to the electron, wave mechanics of four decades back then sought to show how the undulatory theory made it possible for *guiding waves* to "show the electrons where to go." The "guiding waves"—which later were interpreted as "probability waves"—were not limited to the speed of light; they could travel much faster, and the slower the electrons (group waves) move, the faster the constituent waves would move. That is, if U is the velocity of the group waves (wave packets), and v is the velocity of the constituent waves, then $Uv = c^2$, where c is the velocity of light. But a "sub-ether" had to be invented to have the required properties for this. This aspect was well stated by G. P. Thomson (son of Sir Joseph), in his book, *The Atom* (1930, p. 186). We in turn found this useful in our thinking, but in employing the concept of a sub-ether, we always insisted that this medium has the properties of a super-dispersive medium. This "sub-ether" was later termed the *cosmic field,* and was enriched in terms of fields requiring supplementary (higher) dimensions—these fields subsequently related to the newer *plasma* phenomena and concepts.

One interesting footnote to the earlier line of wave mechanics theorizing was the manner in which the doctrine was generalized to provide a "mechanism" whereby "guiding fields" could solve the

problem of the interaction of life and protoplasm and mind and matter. One of those who saw the possibilities was Niels Bohr, whose "complementarity principle" was applied to the dualism just mentioned. My own theories were a part of this ongoing effort at synthesis, as illustrated by my article, "Light, Wave Mechanics, and Consciousness" (1927).

One of the best expositions of this philosophy was set forth by Sir Oliver Lodge in his article, "Interaction of Life and Matter" (*Hibbert Journal,* April, 1931). Here Sir Oliver stated that he would supplement the physicist's conception of the electric and magnetic fields with the notion of a "biological field," which could provide a medium whereby life and mind, themselves non-material, would operate on material bodies. Thus we have a mode of operation whereby life and mind act on bodies without upsetting the laws of mechanics of physical science.

This completes our survey of the significant stages in the developments in cosmology and physical science in so far as these are tributary to our own efforts over the years at building a Cosmic Temple of Wisdom. For us it is important that we have become somewhat better acquainted with our galactic disc, though to be sure we have not yet become so "familiar" with the spiral that we can now grab its two arms and dance a ring-around-the-rosy. But give those astronauts time—and who knows?

Now let us move a little closer to our planetary home—this holiest earth and its emerging World Sensorium. There is still much work to be done, if we are ever to build that Psychosphere.

IX. MATTER, MIND AND MUSIC

In various places we have previously examined what we have termed the DeLoach-Tipple *psychodynamics.* But these earlier sketches have not been complete and integral. Following some further research in relating these investigations to other collateral studies, we are ready for further ventures in psychodynamic synthesis.

This, once more, takes us back into history. My own drive behind these "regressions" reflects the idea that "nothing must be lost," since it is through the close research into the "magnetic moments in human history" that we can discern the "pointer readings" that mark out the guide lines for man's evolution. So for the moment I turn once more to Mrs. Tipple's efforts at recall of the fragments of what may be an important world-view. This connects up with what has previously been set forth.

According to our fellow neo-Pythagorean, the aim of Major

DeLoach's speculations was to span the gap in time in idea-patterns between ancient astrology and the Old Testament preview of New Testament "fulfillments" as this, for example, is symbolized by the story of the "Star of Bethlehem."

In our own integration, we will reinterpret these archetypal myths as symbolic of man's search for a timeless "Temple of Wisdom," now however conceived of as the astral home for a cosmic harmony. This is suggested by the title of the present chapter.

As we have seen, a major part of this sequence is this:

Glastonbury's Temple of the Stars → Stonehenge's Astral Computer Temple → Galactic Temple of Cosmic Music.

Other "temples," such as the Sumerian Ziggurats, and the Egyptian and Aztec-Inca pyramids, also fit into the picture.

The homomorphisms of these archetypal structures are not accidental. As noted, there are scholars who hold that Solomon's Temple was constructed in accordance with musical proportions and that these later were incorporated in the great cathedral of Chartres. According to this account, the builders of the Cathedral of Chartres had discovered these and embodied them in their constructions (in prehistoric times Chartres was a center of Druidism). As Rudolf Wittkower points out in his study, *Architectural Principles in the Age of Humanism,* Pythagorean doctrines of proportion and musical consonance had a powerful seductiveness in the design of much Renaissance architecture. The same point has been made by Otto von Simson in his book, *The Gothic Cathedral,* where it is noted that many other cathedrals were also conceived as "music in stone"—and that is why the proportions of 1 : 2 (octave), 2 : 3, and 3 : 4, were the result of deliberate architectural designing.

More than that, it needs to be remembered that Kepler announced the discovery of his third law of planetary motion in his book, *De Harmonie Mundi* (1619) *(Concerning the Harmonious World),* and that this book, thoroughly Pythagorean-Platonic in spirit, is one of the most astonishing productions in the whole history of human thought. This famous law of planetary motions (i.e., *"For all planets, the squares of the times of one complete revolution around the sun are as the cubes of the mean distances"*) applies also to the paths of the motions of man's artificial satellites around the earth. In simpler language, this means that the relative periods of planets, or satellites, going around the sun, or the earth, are proportional to the 3/2 powers of their radii, as Kepler announced it. This would coincide with the Hermetic axiom, "as above, so below"; and would accord with Swedenborg's "law of correspondence" . . . in either case, an astronomical confirmation of musical consonance.

These several analogies remind us of how easily the religious devotee can be carried away by the esotericism of numbers and proportions that supposedly are built into the pyramids, temples, and cathedrals. On the other hand, we must not reject out of hand this idea of the magic of resonance chambers as cavities for the synergic integration of energy patterns. This concession, of course, does not confirm Madame Blavatsky's thesis in the *Secret Doctrine* (Vol. II, p. 573) that the "sacred unit of measurement" was faithfully observed, whether in the Ark of Noah, the Tabernacle, or Solomon's Temple.

Accordingly, insofar as musical harmonies doctrine is sound, our search for the musical "geodesics" of the Temple of Cosmic Humanism is quite within the frame of an ancient musical-mathematical tradition. But now this doctrine must be translated into modern idiom and conceptual contexts.

This brings us back to the DeLoach-Tipple psychodynamics.

Esther Watson Tipple informs me that she worked with Major DeLoach during the sixteen years he lived in Athens, Georgia. There he put together (matched) the colors and the blocks of the Mercator tuning fork set. This helped Mrs. Tipple comprehend the "message"—but it does not make my own task any easier. It sometimes seems to me that all this is but one more illustration of the principle termed by Georgio de Santillana, *ODTLCWA,* "one damn thing loosely connected with another." But as an integrationist, my faith is that everything *is* connected with everything else, more or less and indirectly or directly.

And so, if some ingenious researcher-integrator discovers that, for example, among the ancient Egyptians and Hebrews, the acacia or tamarisk was held in highest esteem, and that the children of Israel constructed the Ark of the Covenant from a species of acacia—a tree which grew around the body of Osiris and from which also the Crown of Thorns was made and placed around the forehead of Jesus of Nazareth—then these trees, like the thorn of Glastonbury, are symbolic of resurrection and part of the legendary fabric of myths that includes Hiram Abiff whose cedars of Lebanon were cut down to build the Temple of Solomon. All this assemblage of fact and fancy, the integrator must assume, somehow fits into the greater master puzzle picture of a sacred music-drama.

My own considerable job of collating and synthesizing these fragmentary insights is complicated by the fact that Mrs. Tipple has added her own conjectures, this time in the form of what she describes as the ideas of the "Hindu-influenced prophet Ezekiel." The whole scaffolding arises to still dizzier heights when she then takes on the task of trying to recall the ideas of DeLoach, who

apparently left little or no record of his conceptual apparatus in printed form. Thus Mrs. Tipple is doing in her own way what Mrs. Babcock is trying to achieve in her "recordings," the difference being that Mrs. Babcock is working from her recollections of the "unknown and deceased author" whom—so far as she knows—she never met, but who left a sizeable unpublished manuscript; whereas Mrs. Tipple knew and communicated with the then-living author whose proposals were ignored and neglected while he still lived.

If one is able to follow Mrs. Tipple, the last chapter of the book of Ezekiel ties together the color scale from the Hebrew seven tone scale, the Zarlino-Helmholtz seven tone musical scale, and the twelve tone or chromatic scale as this latter is related to the Zodiacal pattern. If this seems off-center, remember that the great Newton also was interested in the analogies between the color spectrum and the tone scale. This part of the story still remains to be told, and this will be done in the proper time and place. These additions will include the recent extensions of the frequency range of the Mercator cycle into regions beyond the visible portions, and utilizing the electronic equipment of Paul Beaver and Erwin Wilson who employ the 53-tone scale.

Even now things are changing. At the time of the publication of his book, *Science and Music* (1938), Sir James H. Jeans predicted that musicians a thousand years hence will be writing and playing their music on a scale that contains 53 notes to the "octave." But must we wait so long? Already musicians are hearing tones outside the old scale. In time musicians will add more and more notes and new complexities will find their places in the music of the future. I shall return to this thought at a later stage.

One source for the color scheme on Mrs. Tipple's diagram, which gives the "sons" and "colors," is provided in *Exodus* (Chapter 28, 14-28), where the Breast Plate of the Jewish High Priest is given, as follows:

15. *And thou shalt make the breastplate of judgment with cunning . . .*

16. *Foursquare it shall be being doubled; a span shall be the length thereof, and a span shall be the breadth thereof.*

17. *And thou shalt set in it settings of stones, even four rows of stones: the first row shall be a sardius, a topaz, and a carbuncle: this shall be the first row.*

18. *And the second row shall be an emerald, a sapphire, and a diamond.*

19. *And the third row a ligure, and an agate, and an amethyst.*

20. *And the fourth row a beryl, and an onyx, and a jasper: they shall be set in gold in their inclosings.*

21. *And the stones shall be with the names of the children, twelve, according to their names, like the engravings of a signet; every one with his name shall they be according to the twelve tribes.*

22. *And thou shalt make upon the breastplate chains at the ends of wreathen work of pure gold.*

23. *And thou shalt make upon the breastplate two rings of gold, and shalt put the two rings on the two ends of the breastplate.*

24. *And thou shalt put the two wreathen chains of gold in the two rings which are on the ends of the breastplate.*

As we have previously pointed out in connection with Mrs. Tipple's diagram, there are three brothers at each of the four gates (walls) of Solomon's Temple. These brothers are indicated by name and for Mrs. Tipple symbolized by musical notes. I have been puzzled by the role of the musical notes and inquired of Mrs. Tipple about the "why" of this.

Back to Solomon

By putting together the expositions that have come to me in letters over the years, it has become clear that there are a number of reasons for all this symbology. Mrs. Tipple's last response to my inquiry stressed a religious motivation: the Ezekiel pattern uses the names of the "sons of Jacob" to build up the Jewish scriptural record in *Ezekiel,* Chapter 48, 35:

"The city's name shall be 'Eternal There'." (Moffat version);

"And the name of the city from that day shall be 'The Lord is There'." (King James Version).

Chapter I of *Exodus* starts with the names of the "household" of Israel, which are the names of the twelve sons of Jacob as listed in Ezekiel's specifications of the "city" (see Matthew I, 1-3, for the later tie-in with Israel). Matthew starts his Gospel with the genealogy from Abraham to Jesus Christ by way of David: Abraham begat Isaac, and Isaac begat Jacob, and Jacob begat Judas (the Moffat translation has his name Judah as written in Exodus's list of the twelve sons).

Pausing for a moment, one might note by way of collateral support for this genealogy a recent statement by Edmund Wilson, as this appears in *The Dead Sea Scrolls,* 1947-1969. It is interesting to note that since his earlier report on the Dead Sea Scrolls, Edmund Wilson reports that still another scroll has been found—the longest that has turned up so far. Apparently it was written in the first century before Christ, in the latter part of the second Temple period.

This Temple Scroll deals with rules for services in the Temple and also plans for rebuilding the second Temple. The important thing (for us) is that late as it was, it was indicated that the courts are to have twelve gates, named for the twelve Tribes, as according to the specifications given in *Ezekiel* and the Apocalypse.

Why Rebuild the Temple?

From what has preceded and the more that is to follow, it is clear that considerable time and study has gone into the labors that have resulted in the present "psychodynamics." The reader may well wonder: why all this effort at what you call the rebuilding of Solomon's Temple? This is a fair question and deserving of an answer—more than already has been given.

It is the thesis of Cosmic Humanism that certain mental patterns are archetypal structures that provide the guiding fields for emergent synthesis. As already indicated, the whole conception of the "galaxy" is archetypal in form; that is, it is the source of one of the great myths implanted in many by the Cosmic Imagination. These archetypes guide mankind's orientations toward teleological goals. Accordingly, the signs of the Zodiac have functioned as a kind of "teaching machine" for mankind, serving as a mental action-pattern in human evolution.

Given the fact of cosmic archetypes, it is inevitable that mankind try to construct models of such morphogenetic patterns in the basic levels. One such that we have already studied at some length is exhibited in my book, *This Holyest Erthe,* and here is portrayed the sacred drama of King Arthur's Knights of the Round Table (Zodiac) as this was enacted in the vicinity of Avalon and Camelot.

Coming down to contemporary times, we urge that the conception of the *United Nations*—or better yet, Tennyson's dream of the *Parliament of man*—is one of the dominant myths implanted by the Cosmic Imagination, driving man on toward superpersonal goals.

Over the long span of time, as we have seen, at various places on the surface of the earth architects have tried to construct replicas of archetypal forms in their pyramids, temples, and cathedrals—these on the basis of the harmonies and proportions that men believed they could embody in the earthly images of the cosmic designs. This—for humankind—gives history a meaning; it salvages the human drama and fulfills an unspoken promise to posterity. Without such guiding fields, human life is purposeless and empty.

There are those who believe that the ancient prophecy of Armageddon—a final warfare between the "children of light" and the "children of darkness," as proclaimed also by the Mazdaism of the Zoroastrianism and the final warfare of the "children of light" and the "children of darkness" of the Dead Sea Scrolls will be fulfilled, and that the planetary holocaust will start in the Middle East, before this century is finished, and that atom bombs will destroy man's wicked societies.

Without committing ourselves to any such nightmare of a catastrophic nuclear denouement, we can certainly predict that

unless the Arab Moslems and the Jews of Israel find a common ground of coexistence, some kind of disaster is likely to come.

In general, what this means for us as builders of the *World Sensorium Temple* is that we humans—Moslems, Jews, Christians, Hindus, and all the rest of us—must together labor to build the Temple of Wisdom.

But now we come to an astonishing proposition. The fact is that *to talk about "rebuilding" the Temple is the wrong use of terms, for the truth is and here we come to the important point that properly understood, the Temple was never built in the first place!* The history books tell us that Nebuchadnezzar, King of Babylon, destroyed the first Temple (in 586 B.C.) and that it was rebuilt by Zerubbabel 70 years later. Later called the great Temple of Herod, it was destroyed once more in A.D. 70 by the Romans, set afire when the Jews sought refuge there. Small wonder that the "Wailing Wall," last remnant of the second Temple, is so precious to the orthodox Jews even today.

But all this represents a materialistic conception of the Temple. The devotees of the Secret Doctrine of the *Kabala* inform us that the Temple of stone in Jerusalem was not what Moses, the Lawgiver, had in mind. And so, one may argue, it was really a restitution of the original spiritual conception of the Temple that Jesus had in mind when he prophesied the destruction of the second Temple ("not one stone shall be left upon another stone, which will not be torn down. . ."). This was nothing less than Jesus's repudiation of the Messianic dream of priestly Judaism in favor of the design of a universalized Temple—*a Temple of Cosmic Humanism?* This, if correct, means that we must globalize into spherical proportions King Arthur's Table—the great geodesic dome itself—a Temple of Wisdom with the harmony, proportion, and consonance of a spherical music, made possible by the integration of all human understanding into a neotype for the World Sensorium.

In many places in this book reference has been made to my volume, *This Holyest Erthe.* We cannot escape the snares of this serpentine maze—so here it appears once again, and this time in a different guise—seemingly.

David's Harp at Glastonbury?

Somewhere in *Man's Search* there is reference to the famous line about "Little David play on your harp." Now David is the one who gave the plans to Solomon for the Temple, with its seven pillars of wisdom. Perhaps the first "stones" of the Temple, as originally conceived, have only now been laid by the Cosmic Humanists, this in accordance with Mrs. Tipple's revised Ezekiel's pattern of the music

spiral. When Mrs. Tipple converts the walls and the gates of the Temple into the chromatic musical scale (seven white notes and five black notes), and relates these to the twelve sons of Jacob (who in the Glastonbury legend are also the twelve knights of Arthur's Round Table), this may seem "way out"—but please reserve judgment.

Stranger still would it be if the "harp of David" were to be found implanted in the Glastonbury Zodiac. To be sure, there is a "Dove" there among the "effigies"; but by what kind of magic does one transmute "Dove" into "David"? This kind of transfiguration requires that—once more—we thread our way through the labyrinthine convolutions of the World Sensorium to unravel the traces of the spiral path of human history.

One audacious student who has ventured into this field is Mrs. Mary Caine, whose unorthodox ideas have shocked others who are working in this same area. Her film on the Glastonbury Zodiac has been criticized because of the construction of the Dove—assuming as she does that Dove and David have a common derivation. She writes me as follows:

May I clear up one point? Our film has been criticized for the construction I put on the dove—saying dove and David have the same root in old Welsh. This is perfectly true—they have a common origin in Sumerian too. Welsh scholars simply haven't got around to this yet. Duer Dovydd, a name for God, is variously translated by different scholars. Some say Dovydd means ruler, others say the "Tower." Dovydd as a word seems to have been dropped by the Welsh. I understand from Webster's dictionary that dove is perhaps an old past participle of "to dive." This I think is right, because it is the Holy Spirit, even in Sumerian myth. God *dove* and sent word to earth. "Diva" must come from the same Aryan root—flying angels or messengers of the Most High. The story of the Dove is the Iona or Jonah story. God sent his word into the deep, from which it emerged clothed in flesh, but remembering (unlike us) its origin.

The trouble with my critic is that she knows the word for dove in Welsh is colomen, not dovydd. But what she hasn't seen is the original meaning of colomen—a column, a pillar, a tower. This I understand to be a continuous speaking tube or umbilical cord from Heaven to Earth, down which communication can be sent. Else why call a bird a column?

German has two words for dove—Taube (from tauchen, to dive) and Turtle—our turtle-dove—from Tor, Tower. The D of Dove also means door in primitive Celtic—Dot—hence Dolmen, etc. It is a door between Heaven and Earth again. A door between two elements, like Jonah and the whale; incidentally, Iona the Holy Isle, was *colonized* by *Columba* from the sea!

Now David was the son of Jesse, the Rod, stem—in fact the column through which in history the spirit was passed, ending in Jesus, the Flower of the Rod of Jesse. Jesse is Esse, the Spirit (Essenes), Jesus of course. In Welsh Jesus is still pronounced 'Esse.'

David's seven stringed harp is his power to interpret harmoniously, coherently, the message he transmits. In Saint David, which is on the head of our Dove, there is an old picture of the biblical David with his harp . . . But all Davids bring us back to Jonah and the Great Fish. Oannes the Chaldean sea-God

had a fish tail, and appeared from time to time (like Jonah) out of the sea to exhort the people and correct error. Oannes is obviously Johannes (John the Baptist) also associated with water, and the Dove of the Holy Spirit . . . David's chariot is also on the Dove—the words of Creation in Sumerian star-myth (cf. Brown's *Primitive Constellations*).

Certainly these are interesting ideas presented by Mrs. Caine. The reader will also note that Mrs. Caine appeals to the Sumerians and their role in the mystery drama.

Mrs. Caine has good support for this view on the origin of the Zodiac figures. Dr. L. A. Waddell has insisted that detailed proofs are available for the Sumerian origin of the "Cymry" of Wales and that migrations to the British Isles could and did occur from as far back as the Sargonic period of 2700 B.C. onwards. In his book, *Origin of Britons and Scots,* this same author has asserted that "Cymry" derive their name from "Sumer." This claim is also affirmed by Mrs. Katherine Maltwood when, on several occasions, she notes that the "Land of Summer" is one form of "Somerset" and that this harks back to Sumer. But on other occasions Mrs. Maltwood is content to say that the knowledge of the stars evident in the Glastonbury Zodiac came from Asia Minor. Those more romantically inclined will urge that this does not necessarily exclude the "lost continent of Atlantis" from providing the antecedent archetype.

From all this it is clear that our glance at the prototypal civilization of Sumer is by no means irrelevant. What *is* quite unusual about our own seeming digression is that it also takes us into the field of "ethnomusicology," as will soon be evident.

The Sumer Temple Culture

One reason for our interest in Sumer is that it was here, in this country, about 4,000 B.C., that the mesolithic villages of the herdsmen gave way to the Temple Community. The "temple" was the house of the city of God. As one would therefore expect, the Sumerian ziggurats, like the pyramids of Egypt, had a *via sacra,* a sacred path for festival processionals.

The temple community developed the concept of "cosmos" as a state within an astrological-mythological framework of celestial powers to maintain order, "on earth as it is in heaven." As Noah E. Fehl points out in his superb volume, *Science and Culture* (1965, Chapter I), this is the background for the rise in the Mediterranean East of the concepts of covenant, law, stewardship, human community and responsibility. This same idea is stressed by Werner Jaeger, who points out in his work, *Paideia,* that the idea of "cosmos" first of all referred to a community of men living under law. Of course, we contemporary neo-Pythagoreans would add that

this terrestrial-celestial harmony is beautifully illustrated in the Pythagorean way of thinking, where the concept of an orderly structure whose pattern can be comprehended by the human soul is illustrated in the human community and the stellar universe of outer space. This idea is older than the classical Greek culture and traces back to Sumer for one of its roots. Such a cosmo-conception is sadly lacking in our floundering contemporary world.

Ethnomusicology and the Dialectic of History

Our brief glance at the civilization of the Sumerians must be selective. As indicated, this takes us into the science of musicology. Our hypothesis of an emerging World Sensorium requires some sort of causal nexus between the planetary field of the Psychosphere and the micro-fields within the gene cells (the *DNA-RNA* polarity). A parallel of sorts might here be mentioned. Just as—so I have heard—the patterns on the wings of some species of butterflies reproduce the patterns of the earth's electromagnetic fields of force in those regions wherein the butterflies are living, so we may speculate that a globalized image of humanity might eventually reflect planetary man as the *Avatar of Synthesis.*

This "transubstantiation" would be a kind of biological "recapitulation theory" in reverse. The archetypal pattern that is prefigured on the cellular level would become a neotype—a guiding field of predisposition from "below," if not from "above."

One of the potent guiding influences available for such a social embryogenesis is music. Music is not only a psychotherapy for the mental health of the individual; it can also be an undreamt of factor for world peace. In this connection, perhaps we should study the volume, *Sufi Wisdom,* especially Vol. II, by Hazrat Khan, which has chapters on the significance of special sounds and syllables for the healing power of music. Beyond that, as we shall see in our final section, the "music of the future" may help to restore some of the sense of awe and reverence that has been destroyed by the organized authoritarian religions and the industrialized society with its polluted environment.

We have already noted that the study of music in relation to its social origins, its cultural evolution, and its future in a coming world civilization are integral parts of an emerging science. Without using the name of "ethnomusicology," we have here and there dealt with phenomena in this field. Indeed, Mrs. Esther Watson Tipple and the present author have collaborated in writing an article on "The Music Logarithmic Spiral and World Unity," which was published in *Darshana International,* V, 1965, pp. 10-30.

There is danger that this "barnstorming" over the plateaus of the

world's cultures may become a bit confusing at times; but like the staff of Mercury (the *caduceus*), the journey will, I hope, wind its way into the spiral of an overall unity. Let us therefore pause for a moment to pay homage to the Sumerians and their superlative achievements.

The Sumerian civilization had no known antecedents—it seems to have fallen out of the sky, and in time then to have vanished into thin air. Its symbolism for communication is not related to any previously known language, though to be sure it did survive in the modified forms of Akkadian and Babylonian cultures. Also, beyond doubt, the Hebrews of the Old Testament borrowed from the Sumerians, indirectly if not directly too.

Very little research has been done on the contributions of the people of Sumer to a planetary culture, in terms of the overtones that integrate into what we call the "spiral temple of music." Of course, in the earlier eras of history, this phrase can be employed only as a figure of speech; and it is only as a component of the "music of the future"—*electronic music of the spheres*—that the term can eventually take on a literal meaning. But come that will—someday.

For thousands of years the ancient Sumerians lived in the area between the Tigris and Euphrates rivers. Apparently they came from the East—Iraq or possibly India. These farmers and potters and builders, before 3,000 B.C., in the city of Uruk—a city already old when the name appears in the Bible as "Erech"—worshipped the goddess Innana, "Mistress of the Heaven." She became Ishtar of the Babylonians, while in the Bible she is known as Ashtoreth.

Like any woman who has human characteristics, Innana became involved with men—two especially. One was Enki, the water god, who eventually gave Innana over one hundred "divine laws"—laws to rule the world, which were put on woven baskets, metalwork, and musical instruments. Another human creature with whom Innana became involved was the famous Gilgamesh, a hero who strikingly prefigures Hercules (or the other way around).

What is especially interesting in all this browsing around is the recent discovery of a Sumerian tablet which has been called the "earliest musical scale." Dr. M. Puchesne-Guiblemin of the University of Liege states that the 4,000 year old tablet shows a Sumerian musical scale that predates any previously known system. These tablets were among the many excavated in the archaeological expedition at Nippur, the cultural center of Mesopotamia for many centuries.

One of the Sumerian epic poems of the fourth millennium B.C. describes an unrivalled and blissful state in an era of universal peace,

before there was a "confusion of tongues." Its contents[5] reads as follows:

> In those days the land Shubur (East), the place of plenty, of righteous decrees,
> *Harmony-tongued* Sumer (South), the great land of the "decrees of princeship,"
> Uri (North), the land having all that is *needful,*
> The land Martu (West), resting in security,
> The whole universe, the people *in unison,*
> To Enlil in one tongue *gave praise.*

This, of course, inevitably reminds one of the Edenic state in *Genesis,* while the four "gates" might be thought to prefigure the coming Temple of Jerusalem.

Now, having added another chord to the harmony of history that humanity needs to carry forward the next movement of the symphony, we return to the task of discovering what must be done to fulfill the vision of the Temple as a spiral edifice rather than the flatland mosaic that dominated Solomon's masonry. This takes us back again to Ezekiel—and what we have ventured to suggest was his distortion of the original architectural plans.

Ezekiel's Wrong Turn

One of the most agonizing adjustments the Jews had to face presented itself in the period following the return of the Jews to Jerusalem from the Babylonian captivity. As Professor Charles Guignebert pictures the situation in his scholarly work, *The Jewish World in the Time of Jesus* (Eng. trans., 1959), the most typical of the inspired writers of this crucial post-exilic period was Ezekiel. His heroic faith and strong utterances lifted up the spirits of the Jews and saved Jahwism from extinction. His harsh denunciations of wickedness made the Jews realize the need for a purification of their religion and the need for the *Torah* as a law requiring exact ritual. The Temple had been destroyed, and so of course it had to be rebuilt, if the cult of the "chosen people" was to be reconstituted.

In the proper order of things King David should have built the Temple; but because he had shed too much blood, he knew it was not his task to undertake. And so it fell to King Solomon, David's son and wisest of men, to build the House. This was accomplished with the help of Hiram, King of Tyre, and his thousands of laborers, so that in effect this was really an international enterprise.

After the Temple was rebuilt, a priesthood more authoritative than ever was reestablished and these officials made the Temple an exclusive center for the cult. The Temple thus became the focus of the life of the people. No matter where he lived, every Jew lifted his eyes and heart to this "Holy of Holies" on Temple hill.

All this was correct and proper, according to the guardians of the established order (the Sanhedrin); but according to Loisey (as quoted by Guignebert), *Ezekiel did more than any other individual to prevent Judaism from understanding its own history and religious role.*

The development of our own theme requires that we look with favor on the Loisey-Guignebert thesis of the Jewish "misconception" (*via* Ezekiel) of its role in the religious development of mankind. In support of this repudiation of the messianic "chosen people" notion, we appeal not only to the above analysis by Loisey and Guignebert, but we also at this point introduce the views set forth by Arthur Edward Waite in his treatise, *The Secret Doctrine of Israel.*

"The Secret Doctrine of Israel"

We know that the author of the above book, Mr. Waite, is a close student of a "secret doctrine" that is much wider than the *Sephir He Zohar,* for as he sees it, this Kabalism appears and reappears in the teachings of the Gnostics, the literature of the Holy Grail, the texts of Hermetic Art, the pageantry of the Rosy Cross, and the symbolism and ceremonies of Masonry.

For Waite and those who follow the Secret Doctrine ("Shekinah"), the Temple was not meant to be a material edifice—it was a temple not built with hands—"through wisdom is a house builded." Moses, Master of the Law, did not live long enough to complete his mission by revealing the true nature of *Shekinah,* and when the Tablet of Laws was broken, *this in effect predestined the ultimate destruction of the First and Second Temples* (*Op.cit.* p. 135). However, according to those who followed the political conception of the messianic role, another day will come and the Jews will have their Messiah and the promised Kingdom.

But unfortunately (or otherwise), the building plan for the Temple—allegedly sketched by a supernatural hand; delivered by David to Solomon; supposedly erected on seven pillars of wisdom, encompassing the Holy of Holies; built on the foundation stone that frames the central point of the world; symbolizing the union of the male and female; and identified by Ezekiel as the celestial throne—all this was unable to create the Temple, which failed twice in times of trial and tribulations. Thus the consequences of Israel's sin in the wilderness was the destruction of the Temple and the drying up of the inspiration of the Israelites. In sorrow and in penitence they have thereafter suffered the consequences—so say the gnostics of the "secret doctrine."

If this is true, *the Temple was never really built; nor has the city of Jerusalem truly been constructed.* Scriptural accounts say that in

the Temple of Solomon the Shekinah reposed between the wings of the Cherubim; but those "in the know" insist that in spirit this never really did come to pass.

For us, builders of a Cosmic Temple of Wisdom, the spiritual conception of the Temple is the only viable one. There is a lack of cosmopolitanism in the traditional Old Testament interpretation which reflects a spiritual introversion. Today this provincialism is everywhere being dissipated in all areas. As the world moves into a planetary civilization, the Jews of Israel must convert their "Homeland" into a global temple and transform the desert into a cultural garden for all humankind. At dawn the Jews of Israel may still turn toward "Temple hill," as the Essenes of old turned toward the rising sun, and the Moslems turn toward Mecca—*but now the Temple is a spiral temple of a planet that houses all mankind.*

Those who favor the spiritual conception as the right and viable one may well point out how the Temple of Solomon could readily become symbolic, for this is hinted at not only in the sacred numbers and astrological symbols, but also in the previsionary instauration of the "edifice" as imagined by Ezekiel in his dream of the "wheels"—to be discussed later. For Christians the Apocalypse foreshadows the demonstration of a new heaven and a new earth; but (as others might add) shows the Kabalistic meaning of the whole.

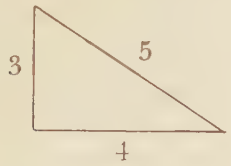
So much, momentarily, for Solomon's Temple. Now back to Psychodynamics.

X. THE TWELVE TONE TEMPLE

According to the present viewpoint, Christian theologians avoid the "vital statistics" of the genealogical record of Jesus of Nazareth because the concept of the "virgin birth" makes this somewhat irrelevant—in their eyes—but more importantly, we surmise, because this attitude is a part of the Pauline doctrine of the conflict of the flesh, which is carnal, and the spirit. But today emancipated thinkers consider as outmoded this alleged gulf between body and spirit. The understanding of Jesus as the "Son of God" does not require a "virgin birth"—not in Cosmic Humanism.

Some Christian theologians may prefer to forget the Jewish ancestry of Jesus. But this reminder is part of the motivation of Mrs. Tipple for placing the names of the twelve Sons of Jacob in her drawing of the "Ezekiel's Pattern." However, this does not explain the *Triads* of notes, where the three brothers at each of the four gates serve as symbols (personifications) of three musical notes. Nor does it explain the colors that appear in the diagram. So let us continue our explorations in this tantalizing field.

Parts of the rationale for the presence of the three brother triads—which apparently are like the tones essential to the "chordiness" of the musical harmony—is that the triads also express the 3 : 4 : 5 ratio of the Pythagorean theorem ("the square erected on the hypotenuse of a right triangle is equal to the sum of the squares on the other two sides"). As the reader will recall from his elementary geometry, Euclid explains the famous Pythagorean theorem by generalizing it as follows:



or

$$\begin{array}{r} 3^2 = 9 \\ 4^2 = 16 \\ \hline 5^2 = 25 \end{array}$$

But when we translate this into the idiom of modern concepts, the version of the triangle of three notes then must exemplify a logarithmic relation—something unknown to the classical Greeks—and here the shape is no longer that of a flat Pythagorean right triangle.

As we know, modern mathematics goes far beyond Greek mathematics to expressions for the "powers" and "roots" of numbers and logarithmic representations, which latter tie in with the physiology of man's sense modalities where, as psychophysics would put it, "the sensation varies as the logarithm of the stimulus." Moreover, in music appreciation, *harmonics* (or "overtones") are most important for consonance and dissonance effects.

In terms of the language of physics, the lowest pitch tone in a series of overtones results as the fundamental for the tones of the *octave* (or first overtone), the *perfect fifth*, or second overtone, above it—and so on. That is, the fundamental tone is the first harmonic in the logarithmic number line of the harmonic series; the octave is the second harmonic; and the perfect fifth is the third harmonic. Accordingly, 1 : 2 (2/1) is the *octave;* 2 : 3 (3/2) the *perfect fifth;* 3 : 4 (4/3), the *perfect fourth.* The perfect fourth interval is the inversion of the interval of the perfect fifth, since the two intervals add up to the octave: (3/2 x 4/3) = 2/1 (octave). The scientific pitch for middle C is 2^8, which equals 256 *cps.* These familiar ratios grow out of 96 *cps,* the fundamental or lower tone, as follows:

3 x 96 = 288 *cps* (third harmonic of 96 *cps*)
4 x 96 = 384 *cps* (fourth harmonic of 96 *cps*)
5 x 96 = 480 *cps* (fifth harmonic of 96 *cps*)

Accordingly, the way the auditory system of man hears sounds, if the ratio is 3 : 4 : 5, this is basically 3 x 96; 4 x 96; 5 x 96.

Referring now to Mrs. Tipple's Ezekiel's Pattern (Diagram XI), it should be remarked that the "triangles" are a reflection of the expansion of a structure into a dimension that is more inclusive: the shadowgraph triangles, with the subscript numbers as musical letters, then becomes representative of logarithmic spirals. That is to say, by introducing *log.* terms, we discern the difference between the Euclidian triangle previously diagrammed and the "triangles" as pictured in the Ezekiel's diagram. Here the "Yin" direction is the reversed direction from that which provides the major triad in overtone phenomena. It is also evident—so Mrs. Tipple states—that the diagram shows the open position with the octave interval between $F^{\#}5$ and $F^{\#}4$ (i.e., 6 : 5 : 4 : 3).

If the reader begins to feel a bit overwhelmed by all this, please recall that Mrs. Tipple has confessed that it took her twenty years to understand what Harry T. Partch had expounded in his study, *The Genesis of Music.* Mrs. Tipple and Dr. Frye changed Partch's terminology so that "Odentity" (from the "overtone direction") becomes the *Yang* direction (counter-clockwise), and "Undentities" becomes *Yin,* the reverse of *Yang,* and this—Mrs. Tipple avers—makes it clear what Major DeLoach was describing.

Having mastered all this, it then is possible to invent and play a musical game—and Esther Tipple informs me that "the name of the game is Cosmic Humanism." So be it!

I must confess that it may require more than twenty years for me to understand how to "play the game." But one simple thing I *do* see, namely, that "chordiness" of the three notes (triads) rests upon the mathematical simplicity of sound vibrations, as Pythagoras of old had informed us and as Browning's *Abt Vogler* so beautifully re-echoed it.

Mrs. Tipple's ponderings over Dr. H. Baravalle's term "near-coincidence"—between the perfect fifths on the spiral rounds and the octave points of radial intersection—led her to conclude that this phenomenon is not mere "coincidence," but that here a field of electromagnetic force is built up to the place where the never-ending spiral approaches the radii, and the cycle can be rounded off to a circle, which provides equal interval measurements so that all the tones involved are infused with vitality.

Some students would suggest that the building up is not in the "physical field"; but it is subjective. That is to say, in the nervous system there is the "gravitation" that is experienced. But one wonders: if this is like "chordiness" in music, is the interaction between the part-processes in the "physical" situation? Or better

still, does this not become an unreal problem in the panpsychistic philosophy of a cosmic humanism?

It is interesting to note that something like this does occur in physics, and in the very field with which we have been so much concerned—the field of superconductivity. I quote here from an article on "The Elusive Code of Life," by Barry Commoner (*Saturday Review,* October 1, 1966, p. 74), as follows:

> For a number of years physicists labored to explain superconductivity. Many attempts were made to discover which of the known properties of separate electrons leads to the prediction that superconductivity would occur at low temperatures. None of these efforts succeeded. Success came only when it was realized that in superconducting metals there are no separate electrons but only a kind of collective electrical fluid. Calculations were then developed which showed that although separate independent electrons exist in a metal at ordinary temperatures, at very low temperatures they interact with the metal's orderly atomic structure in such a way as to lose their individual identities and form a coordinated, collective system which gives rise to the phenomenon of superconductivity.

The "uniqueness" here is a property of the whole; it is an example of "emergence"—the kind of thing the *gestalt* theorists have also emphasized (as pointed out long ago in my own article, "Gestalt Psychology," *Philosophical Review,* 39, 1930, 556-572).

Spirals Within Spirals

For us, the moral of the foregoing story is that there seem to be integrative forces at work on all levels to produce atomic fields that result in molecular organizations, molecular fields to create macroscopic cellular structures, neural brain structures to produce mind fields, and mind fields to assist in the integration of the *Psi*-field of the World Sensorium. The musical logarithmic spirals can therefore be regarded as additional exemplifications of a general process of creative evolution from the "lowest" to the "highest" levels.

To be sure, it is good to know that there are forces in the cosmos—at all levels spurring emergent entities on to the next level of evolution. But in a sense man may only be returning to some pre-existent level with which he once maintained a communion service—as indeed the Helium Psychosphere concept seems to imply. If many millennia ago man had a consciousness of interaction with the Psychosphere—psychic energy in its free or unbound-to-man state—and if subsequently this consciousness was lost, and if, still later, tomorrow in fact, this co-consciousness is to be developed, then our surmise of a "social karma" must be correct.

But beyond all this—the earth, the spiral Temple of Wisdom, planetary music and ethnomusicology, and the Helium Psycho-

sphere—we still face the problem of the relation of human psychodynamics to the dynamics of the solar system and the galaxy. And when we thus broaden our focus, we face up to a return engagement with plasma physics and the magnetic lines of force and their interactions (sometimes non-linear), *via* longitudinal and transverse, helical and vortical, topologies—and don't forget the toroidal "doughnuts." Such are the involutions-evolutions-convolutions of World Sensorium building.

At this point, once more, we should point out that the problems of causal ramifications and connections are complex and sometimes baffling. Somehow, as we have pointed out: *how the possibility of what a thing might become actually helps to determine what it does become is the ultimate mystery of evolution.* The solution that is proposed in Cosmic Humanism is that on the biological level this calls for a synthesis of the theories of "preformation" and "epigenesis"—by way of a non-Aristotelian logic—a new type of causality that is wholistic and non-linear.

At this point one begins to feel like Ezekiel must have felt in the presence of the "fiery wheels." One can only wonder whether what he experienced was a part of this cosmic symphony of spirals within spirals—something so sublime and ecstatic ("psychedelic") as to leave him speechless and wrapt in wonder for seven days. Perhaps at this point we should try to recapture his wondrous vision—or dream—or whatever it was . . . So on with the final act of the drama.

XI. EZEKIEL—ON WINGED WHEELS

In several places in this book we have referred to Ezekiel's famous vision. This vision was indeed most remarkable—miraculous as some would say—though no more incredible than the story of Ezekiel's death, when his body supposedly remained in Babylon while his "double" was transported elsewhere by an angel who carried him off by a lock of his hair! This "levitation" or "teleportation" is sufficiently beyond the normal to engage any "paraphysicist." Let us recount the episode.

From *The Book of Ezekiel* in the Old Testament we have the story of the prophet Ezekiel. In Chapter One there is the report of this strange event in "the land of the Chaldeans . . . in the fifth day of the month, which was the fifth year of King Jehoiachin's captivity." From this Chapter, we quote the record, beginning with Verse Four:

4. *And I looked, and, behold, a whirlwind came out of the north, and a great cloud, and a fire infolding itself, and a brightness was about it, and out of the midst thereof as the colour of amber, out of the midst of the fire.*

5. *Also out of the midst thereof came the likeness of four living creatures. And this was their appearance; they had the likeness of a man.*

6. *And every one had four faces; and every one had four wings.*

7. *And their feet were straight feet; and the sole of their feet was like the sole of a calf's foot: and they sparkle like the colour of burnished brass.*

8. *And they had the hands of a man under their wings on their four sides; and they four had their faces and their wings.*

9. *Their wings were joined one to another; they turned not when they went; they went every one straight forward.*

10. *As for the likeness of the faces, they had the face of a man, and the face of a lion, on the right side; and they four had the face of an ox on the left side; they four also had the face of an eagle.*

11. *Thus were their faces: and their wings were stretched upward; two wings of every one were joined one to another, and two covered their bodies.*

12. *And they went every one straight forward: whither the spirit was to go, they went; and they turned not when they went.*

13. *As for the likeness of the living creatures, their appearance was like burning coals of fire, and like the appearance of lamps: it went up and down among the living creatures; and the fire was bright, and out of the fire went forth lightning.*

14. *And the living creatures ran and returned as the appearance of a flash of lightning.*

15. *Now as I beheld the living creatures, behold one wheel upon the earth by the living creatures, with four faces.*

16. *The appearance of the wheels and their work was like unto the colour of Beryl: and they four had one likeness: and their appearance and their work was as it were a wheel in the middle of a wheel.*

17. *When they went, they went upon their four sides: and they turned not when they went.*

18. *As for their rings, they were so high that they were dreadful; and their rings were full of eyes round about them four.*

19. *And when the living creatures went, the wheels went by them: and when the living creatures were lifted up from the earth, the wheels were lifted up.*

20. *Whithersoever the spirit was to go, they went, thither was their spirit to go; and the wheels were lifted up over against them: for the spirit of the living creatures was in the wheels.*

Ezekiel, of course, was so completely overawed by this weird and frightening affair that he fell upon his face. While prone, he "heard a voice of one that spake," and shortly thereafter, he reports,

I heard also the noise of living creatures that touched one another, and the noise of the wheels over against them, and the noise of a great rushing.

Finally Ezekiel was lifted up and taken away to a place by the river Chebar, where he "sat . . . astonished . . . seven days."

Ezekiel believed that he had been in the hands of God, and that the landing of the winged wheels carrying a voice was simply God's way of announcing Ezekiel's supernatural appointment as a "watchman unto the house of Israel."

Students of a naturalistic bent have always regarded Ezekiel's adventure as visionary. But as we shall see in a moment, some believers in "flying saucers" have insisted that the experience was not illusory and that Ezekiel actually saw four men in space suits who had dropped down to pay him a visit, and then took off in flight from him, with all the "fireworks" and "sound effects" appropriate to the occasion. Visitors from "outer space"?

There are several things in the foregoing account that interest the students of psychodynamics. The reference (in the full story) to the sapphire throne, and to the amber, crystal, and beryl, remind us of the colors that appear in the Tipple-DeLoach "Ezekiel's Pattern." Something like a justification for the Temple's pattern of colors and tones appears in *Exodus,* which, as previously noted, starts with the names of the "household" of Israel—the names of the twelve sons of Jacob as listed in Ezekiel's specifications for the "City."

Colors are also named as they appear on the Breastplate of the High Priest, as reported in *Exodus,* Chapter 28 (14-24). Here we are informed:

> And the stones shall be with the names of the children of Israel, twelve, according to their names, like the engravings of a signet; every one with his name shall they be according to the twelve tribes.

To be sure, it is not easy to make the transposition from this—which is rather vague—to the twelve tones of the "sons" at the "gates."

Returning to Ezekiel's vision, I shall consider several theories of his dream. Also we are not yet finished with his concern for reestablishing the Temple of Jerusalem. First let us glance at Jacob Böhme's mystical experiences.

XII. *THE AURORA* AND THE "SEVEN SPIRITS"

One of the several possible linkages of Ezekiel's vision with later speculations is provided by Jacob Böhme, famous Germanic mystic. In his book, *The Aurora* (Eng. trans. published in 1960[6]) the following lengthy passage occurs:

> 85. But if I should describe the Deity in its birth or *geniture* in a small round circle, in the highest depth, then it is *thus:*
>
> *In a Similitude.*
>
> 86. Suppose a WHEEL standing before thee, with seven *wheels* one so made in the other that it could go on *all* sides, forward, backward and cross ways, without need of any turning back or stopping. (See Chapter 19, par. 81 *et seq.*)
>
> 87. In its going, that always-one wheel, in its turning about, *generateth* the others, and yet none of them vanish out of sight, but that all seven be visible or in sight.

88. The seven wheels always generating the *naves* in the midst or centre according to their turning about, so that the nave stand always free without alteration or removing, whether the wheels go forward or backward or cross ways or upward or downward.

89. The nave always generating the *spokes*, so that in their turning about they stand right and direct from the *nave* to the *fellies* of the wheel: and yet none of the *spokes* to be out of sight, but still turning about thus one with another, going whithersoever the *wind* driveth it, and that without need of any turning back or *stopping*.

Now observe what I shall inform you in the application of this.

90. The *seven wheels* are the seven spirits of God, the one always generating the others, and are like the turning about of a wheel, which hath seven wheels *one in another*, and the one always wheeleth itself otherwise than the others in its station or position, and the seven wheels are *hooped* round with *fellies*, like a round *globe*.

91. And yet that a man may see all the seven wheels turning round about severally apart, as also the whole *fitness* or compass of the frame, with all its fellies and spokes and naves.

92. The *seven naves* in the midst or centre being as it were *one nave*, which doth fit everywhere in the turning about, and the wheels continually generating these naves, and the naves generating the spokes continually in all the seven wheels, and yet none of the wheels, as also none of the naves, nor any of the fellies or spokes, *to be out of sight*, and as if this wheel had *seven* wheels, and yet were all but *one* wheel, and went always *forward*, whithersoever the wind drove it.

Now behold, and consider:

93. The seven wheels one in another, the one always generating the others, and going on every side, and yet none out of sight, or turning back.

This is all very fascinating. And yet—up to this point—it certainly is not clear how Böhme's "similitude" clarifies the mystery—Ezekiel's or Böhme's. Perhaps the author of *The Aurora* only compounds the mystery: two minds separated by several millennia, and yet with but a single thought? How is that possible?

Now for another theory.

XIII. ATLANTEAN AIRPLANES OR *UFOs*?

When I sent a copy of Böhme's pages to Mrs. Tipple for her response, she replied as follows:

The four entities with six wings each, who faced in all four directions yet were attached to each other, made clear to me that when they moved they were going in a horizontal direction to the plane of the earth's surface. This made sense when tied in with the idea that airplanes were used in Atlantis and that Ezekiel had a correct racial memory vision ("retrocognition"?) of what was there before misuse of the power discovered by the Atlanteans caused their destruction so that their knowledge was lost to mankind.

This appeal to aircraft such as the Atlanteans supposedly built and navigated is one that grips the Atlantean seers and theosophists from Blavatsky to Edgar Cayce. But why limit Ezekiel's astronauts to the earth and its inhabitants?

We have already mentioned that Ezekiel's "craft" has also been suspected of being a "flying saucer." This line of thought has been advanced by the French-born mathematician, Jacques Valiee, who considers the possibility that Ezekiel's narrative might have been an experience of a *UFO* sighting. Even so sober a journal as the *Saturday Review* has presented hypotheses along these lines. In his article, "What Are the Unidentified Aerial Objects," (August 6, 1966), Mr. John Lear reviews the ideas of the Russian astronomer I. S. Shlovski and the Harvard astronomer Carl Sagan, two scientists who have coauthored a book on *Intelligent Life in the Universe*. Here they speculate about visitors from outer space.

It is even suggested that such ambassadors from another planet could have given mankind the "teaching culture" of the Sumerians, this being in addition to serving as the pilots of the space ship that Ezekiel encountered. But if one is going to indulge in such a plethora of imaginative speculations, why not also suppose that these visitors—from Venus?—were also the teachers of the ancient Atlanteans whom Plato wrote about?

XIV. SPIRALS WITHIN SPIRALS

My next "exhibit" in Ezekiel's gallery of visions will introduce the reader to Mr. J. K. Konn, a student of alchemy and the field of mysticism. This middle-aged gentleman devotes his leisure to the pursuit of the Hermetic arts, the symbolism of alchemy especially. Without any previous training in the visual arts, he rather suddenly felt impelled to purchase the necessary materials to paint pictures of what appeared before him in his mind's eye.

Mr. Konn works with visual symbols which are very old, he believes, some of them in remote times being considered "Sacred." One of them—the Cosmic Cross—is to be found in the works of Giordano Bruno. Now the time is right, he says, to make these drawings public and he has given me permission to reproduce them. For the present, I shall reproduce the one diagram that is relevant to the present inquiry. This is the picture of Ezekiel's "wheels within wheels," which appears here as Diagram XXII.

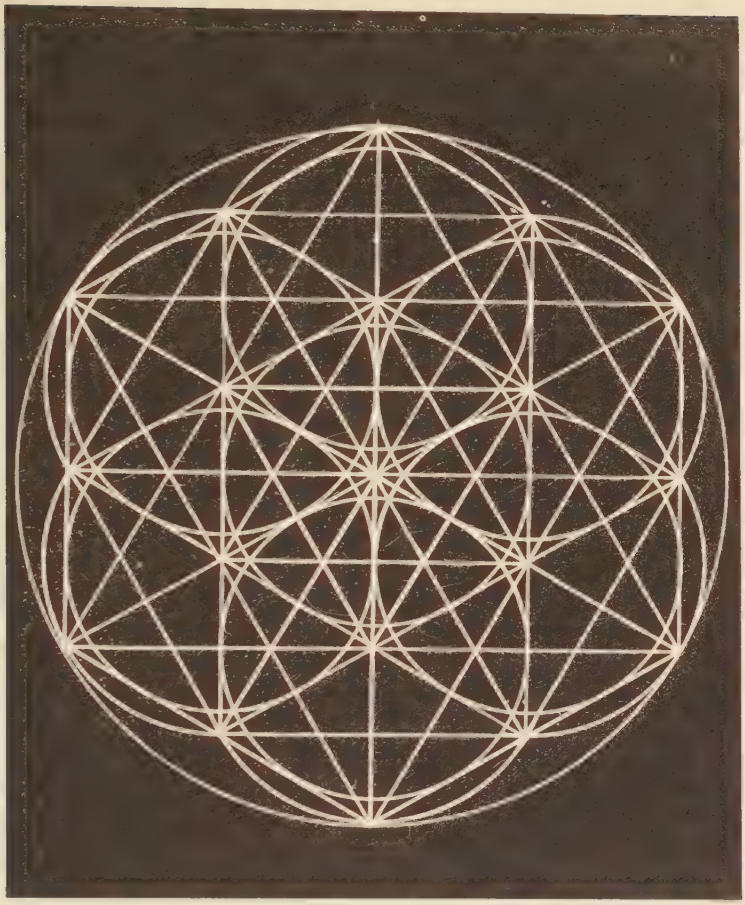


DIAGRAM XXII

After a comparison of his own visual diagram with Böhme's verbal description as given in *The Aurora,* Mr. Konn is convinced that the two are similar (*homomorphic* in my terminology). His circle symbols are like a map and each item can be transferred from one to the other. According to Mr. Konn,

> the straight lines are the Holy Ghost, the inner circles the Son, and the outer circle is the Father.

Having made these identifications, Mr. Konn felt impelled to share this "message" from a "light" under whose influence he has lived for fifteen years. The person who happened to be chosen by Mr. Konn is the present author. After some study, I find these creations most intriguing; but I must also say that the language of Christian "trinitarianism" has, thus far, not been congenial to my own ways of

thinking—though the reader will recall that we have previously given the equivalents of "trinitarianism" in our developing Cosmic Humanism. So far as I know, there are no germs of "trinitarianism" in Ezekiel, and so one wonders how far Ezekiel and Böhme could be harmonized, if we follow Mr. Konn's particular symbolism.

But it does seem that Mr. Konn's paintings and the verbal descriptions in *The Aurora* are two different languages for representing Ezekiel's pattern. Also it happens that in the Tipple-DeLoach psychodynamics the seven tones and colors could be said to correspond to Ezekiel's "wheels." But what do we do about the twelve tones of the chromatic scale and the twelve sons of Jacob, which play a "key" role in the psychodynamics? Do they have a proper place in Ezekiel's vision? And are the "wheels" transposable to Solomon's Temple as reconstructed by us neo-Pythagoreans?

Reply to a criticism

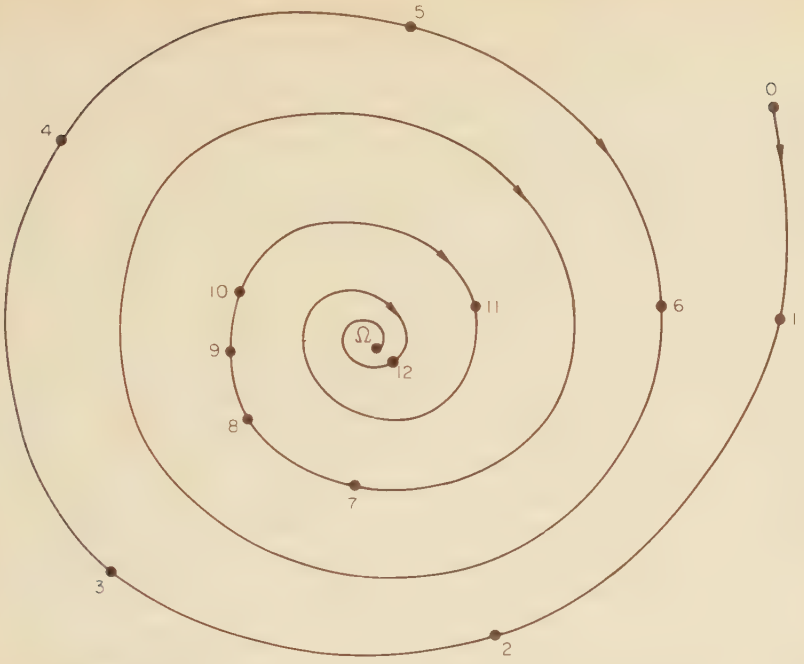
I showed this picture to an informed student of Jacob Böhme's mysticism, thinking that she might enjoy the diagram. This turned out to be wrong. This knowledgeable student replied in part:

I don't see any relationship at all between the seven wheels in *Aurora* and Mr. Konn's diagram. One is the direct transmission in words of a realm which neither the senses nor reason can penetrate, while the other is a pleasant mechanical drawing from Chicago! Ezekiel's wheels within wheels instantly come to mind when reading *Aurora,* but not from looking at the diagram, in which there is no life. Or so it seems to me.

My response to this negative reaction is that it may be unfair. Of course, "there is no life" in a picture-diagram; but in that sense, neither is there "life" in the words of Ezekiel or Böhme. If our critic could have translated the "static" into the "dynamic" through the use of a bit of imagination, the analogy might "spring to life."

As a pictorial representation, "wheels within wheels" is static; and I am much interested in the dynamics behind wheels and circles—and spirals too. If we could pull out this diagram of Konn's into an orthogonal direction, like an accordion, and convert the "wheels" into "spirals," what would appear? I would like to think that the "picture" would then resemble the diagram as shown in Diagram XXIII. For this diagram, I am indebted to my former student, Mr. Donald C. Hewitt, at the University of Pittsburgh.

But no amount of wishing can lead one to conclude that Ezekiel or Böhme ever anticipated that this "angel craft" or "Trinitarian doctrine of circles" would turn into the logarithmic spiral which now animates the reincarnation of Solomon's Temple of Wisdom. But such is the alchemy of chemical weddings!



0. Cosmic field of energy
1. Sub-atomic particles
2. Atoms
3. Molecules
4. DNA–RNA
5. Cells
6. Metazoa
7. Man (reflective consciousness)
8. Fire, tools, language
9. Countless socializing and
10. Integrating steps
11. World sensorium
12. Cosmic temple of wisdom
Ω The omega point

DIAGRAM XXIII Spiral Quantum Jumps of Evolution

Perhaps some anticipation of this astonishing transubstantiation appears in Madame Blavatsky's *The Secret Doctrine,* where (II, p. 629) she tells us that Jacob Böhme proved himself to be a great Occultist when he enunciated the seven (septenary) properties of nature. For H. P. B. and other Occultists (cf. II, p. 623), seven is a preeminent number—*six concentric circles around a seventh, and seven rings within one another around a central point.* This latter surely must be a reference to the wheels that Ezekiel envisioned. According to Blavatsky, these seven circles are symbolic of the seven planetary Logoi that sustain the world. For me they are the seven cosmic energy levels of the 8-dimensional Cosmos. Is that a fair exchange?

One final word about Ezekiel. It seems to me that Ezekiel never really comprehended what Israel's Temple was meant to be. His

blueprint for the "masonry" was too materialistic. And not at all surprisingly, history has buttressed his misconception. And so when someone with more than the usual endowment of Cosmic Imagination—incurving across brain lobes and refracted through the human cortex—sees through the mind's eye what the Cosmic Lens is focusing, this individual is dismissed as a "visionary."

When I transmitted Mrs. Tipple's color print of "Ezekiel's Pattern" to Isaac Asimov, because he authored a book, *Asimov's Guide to the Bible* (though he is also well-known as an interpreter of the sciences), he replied as follows:

> The men who built Solomon's temple were probably as prosaic as any bricklayers and masons today and that mathematics had nothing to do with their work beyond what was needed to keep the structure from actually falling down.

Of course, Mr. Asimov—in this instance—is no different from other exoteric students. For such, the Temple requires no "secret doctrine." But the archetypal form is still there—somewhere, somehow—a morphogenetic pattern awaiting its embryogenesis. Perhaps the Platonic Idea is resident in the Helium Psychosphere as a vehicle for planetary "information storage" and "data processing"—and eventual "retrieval."

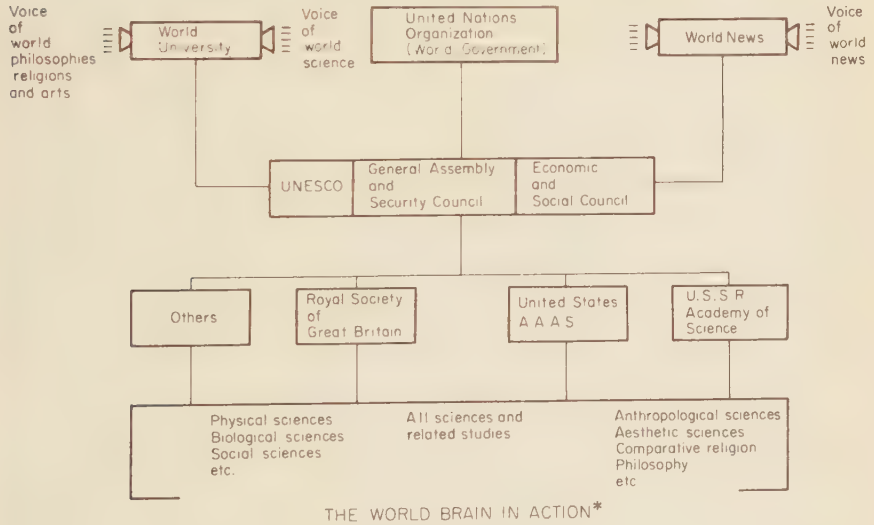
Is it possible that when Ezekiel was granted his adventure with the "winged wheels," he was—without realizing it—being called back to the lost vision of Moses and the "secret doctrine" of the true Jerusalem? But Ezekiel never learned what his vision was all about—or if he did, it was too late—so he "sat . . . astonished . . . seven days"! He did not see that, through him, the Israelites were being offered a second chance. Perhaps it is still not too late to rectify the "wrong turn,"—*no Armageddon, please, "Revelations" or not.*

The satellite Temple as here proposed is the vision that man should be projecting. It will not have its foundations in any one spot on the surface of the earth. It will be a Temple in the Sky, where the festival lights can be carried outward from the heavens on wings of song and sight. *What we are saying is that Ezekiel's vision of the "winged wheels" was perhaps a kind of precognitive consciousness of the fiery architectonics of the global communications satellites, the "fireworks" of lightning and the rushing sounds being nothing other than the TV and radio waves bouncing back and forth between the pulsing ionosphere and the earth-but programmed via the Psychosphere!* In that day, as Robert Browning proclaimed toward the end of his poem, *Abt Vogler,* "On earth the broken arcs, in the heavens the perfect round."

It will surely seem like a startling development if mankind discovers that the priceless load of dust and rocks—glazed rocks and

glass beads of extraordinary beauty—brought back from the lunar surface by the astronauts has a contribution to make to the theory and construction of the Satellite Temple. But observe: we know that among the many astounding discoveries about the moon, not the least of these is the fact that *the moon resonates like a gong!* Much is still a mystery—for example, whether the moon's magnetic field and the solar wind collaborated in producing the metallic-like minerals of the lunar surface—but when one reads the description of the seismic tracings resulting from the landing of Apollo 12 as being like "Kicking the Gong," one can immediately envision Pythagoras with his hammer striking the musical anvils of the planetary gongs of the solar system. And if Mercury is "plated with glass," is this part of the symphony of "singing flames," or perchance is it more like Krishna dallying with the maidens of Venus as he blows his flute and they all dance to a celestial choreography? Good Heavens—do we have here the adumbrations of the "music of the future?" And if so, do we have the plans for the United Nations satellite system we projected in June, 1962? Now broadened to include two *syncom* satellites, *Prometheus & Krishna,* the following sketch may still provide the:

PROPOSED UNITED NATIONS COMMUNICATION SATELLITE SYSTEM
(Project Prometheus and Krishna)



THE WORLD BRAIN IN ACTION*

DIAGRAM XXIV

Now some final words about possible programming. This brings us back to the topic of the "music of the future."

*From *The Integration of Human Knowledge,* by Oliver L. Reiser (Porter Sargent, Boston, 1958).

XV. THE MUSIC OF THE FUTURE

Much of the thinking of the present and previous chapters has been given over to a consideration of the possibility of a symbolic transubstantiation of the ancient Temple of Judaism—with its Twelve Tribes of Israel and its Twelve Sons of Jacob—into a Temple of the New Jerusalem, a home for a heavenly consonance of planetary wisdom.

To attain this transfiguration, we have pursued diverse excursions into remote domains. But the fundamental theme has had as its keynote the increasing consciousness of a human, planetary, and cosmic harmony. Man's gradual but growing awareness of what we have termed the "spherical music" of the "spiral brotherhood" is, or will become, the carrier wave of human cultural integration in religion, science, the arts, and philosophy. This "third culture" mass movement has, in one small area, been illustrated by the broadened range of the musical spectrum from the 12-tone chromatic scale into the 53-tone scale, this in order that modern music can be adapted to the "cross action" of the emerging electronic music referred to in our opening chapter, "The Book of Man." In a word, this is "man's message to the galaxy."

In terms of human time consciousness, the steps have frequently seemed halting and painful. Nor have they always been noted as steps of forward progress in the great human adventure. But in retrospect, the main stages stand out. The beginnings were related to man's religious invocations to the mysteries of creation. As Donald Hatch Andrews points out in his book, *The Symphony of Life,* for some primitive peoples the dance is a ritual that repeats the primordial act of creation. And for the Hindus, the universe stems from a cosmic rhythm which is expressed by the drum; and later the 12-tone scale derived from the relationship of musical sounds to numbers, so that the 1 : 2 relation of the vibration frequencies of the *octave* and the 2 : 3 frequencies of the *fifth* came to be embodied in the Pythagorean succession—and so on. Thus in the course of time the *idea of cycles* was established in musical history, and so we now recognize that the circle of fifths, which provides the transition from key to key, is a more modern form of the ancient concept of *circuit,* the annual cycle, the basic astronomical relationship between terrestrial and celestial phenomena.

In all this more and more abstract principles come into play, and the mathematics of tonal scales and structures, and the trends in the evolution of musical patterns, become more evident. Our own search for the forms of unity leads us to the concept of the spiral path, something that includes in its journey the caduceus—two serpents

circling around a rod—as perhaps the symbol of the seven levels of human nature as man's desire for "total experience" aspires to the cosmic spheres.

From the viewpoint of ethnomusicology, the entire dialectic of the evolution of musical scales and tonal combinations and sequences must contribute to the music of the future. The world music that can help to fabricate—or reestablish contact with—the World Sensorium is coming into view. We are already on our way—one can hear the "beat," the electronic thrumming.

There is nothing shocking about this idea. As already noted, in his book, *Science and Music* (1938), Sir James Jeans predicted that musicians a thousand years hence will be writing and playing their music in a 53-tone scale. Sir James foresaw that in the distant future, after all possible combinations of the present 12-tone scale have become boring to the human ear, we will find it tolerable to add more notes to the scale, thus splitting the octave until the scale has been enlarged. Already quarter tones scales have been utilized. With electronic instruments that are not limited to the 12-tone piano keyboard, these "purer harmonies" and "added complexities" will find their places in the music of the future. But—one wonders—must we wait so long? Our traditional limited scales have their origins in the limitations of man's hands and resulting auditory habits, and these are rapidly being overcome.

Aside from new tonalities, there are tentative gropings into novel forms of synaesthesia. Here we have in mind the experiments in light and color that are in progress, e.g., in concert halls, where one can "see" music, where spectators can listen to music accompanied by light and color effects. Here one thinks especially of Scriabin's color organ and Thomas Wilfred's *Clavilux;* while in the area of painting, the ideas of the artist Wassily Kandinsky should also be mentioned. Recently at a concert hall in Russia the "Prometheus" symphony of the composer Alexander Scriabin—who, as noted above, dreamt of the synthesis of light, color, and music—was performed in that mode of synaesthesia.

All such experiments, by way of psychedelic electronic synaesthesia, will certainly open up new forms and levels of consciousness expansion. But just how the kinds of "total experience" we are here envisioning might be enhanced through the utilization of global communication satellites—for all the world to see and hear as *GAEA* broadcasts and televises the programs through PROMETHEUS-*KRISHNA*—remains for the future to reveal . . . So . . . make way for *TOMORROW'S TEMPLE OF THE PSYCHOSPHERE!*

NOTES AND REFERENCES

1. Cf. "Celestial Ammonia," *Scientific American*, 220, 1969 (Feb.), 43-44; and "Spectra, Variability, Size, and Polarization of H_2O Microwave Emission Sources in the Galaxy," by S. H. Knowle and C. H. Mayer, *Science*, 163, 1969, 1055-1057.
2. See "Quantized Vortex Rings in Superfluid Helium," by F. Reif, *Scientific American*, December, 1961.
3. See the survey, "Water Waves and Hydrons," by J. L. Synge, *Science*, 138, 1962, pp. 13 ff.
4. Cf. "Probability, Natural Law, and Emergence," by O. L. Reiser, *Journal of Philosophy*, 23, 1926, pp. 421-434. See also, "Light, Wave Mechanics, and Consciousness," *Ibid.*, 25, 1928, 309-317.
5. Quoted from *Sumerian Mythology*, 1961, by Samuel Noah Kramer, *Frontispiece* (Harper Torchbooks).
6. I am using the English translation of *The Aurora* by John Sparrow, published in London in 1960 by John M. Watkins and James Clarke and Co. The latter publishing house is now located in Cambridge, England. My passages are herewith reproduced by Publisher's permission.

8

From Astrophysics to Cosmic Humanism

Cosmic Humanism is the name we give to man's ongoing search for truth. By the word *Cosmic* we indicate that our search for the truth must range from nuclear physics to biochemistry, involving all the sciences. By the word *Humanism* we indicate that we must also search for truth through the whole range of life sciences, history, psychology, anthropology, the arts, and the religious expressions of mankind. A cosmology that affirms the creative principle inherent in universal operation will lead to a release of the creative capacities in man.

I. THE GOALS OF COSMIC HUMANISM

In all our presentations we have sought to exemplify and confirm the above formulation. The program as announced is ambitious; but certainly it is a worthy and urgent project—one in which all "avatars of synthesis" are invited to join.

In the relentless search for synthesis, as recorded in the previous chapters, we have undertaken a grand tour of the universe—on all levels—from the top to the bottom and from the left to the right, and back again. One wonders: what have we learned from this round trip through the wilderness of worlds? Before we evaluate, let us recapitulate. Then let us make one final effort to understand what we have surveyed.

As the reader will recall, in "following the gleam" we have maintained our sense of direction by using all the "markers" that are available, including the mental laser beams provided by Preston Harold and Nikolai Kozyrev (see later). True, in our voyages beyond the horizons we have had some difficulties with the "left" and

"right" symmetries that seem to rule the universes in the cosmic hierarchies. But we have concluded that if we are permitted to refer the "clockwise" and "counterclockwise" motions to the more inclusive reference frames of the higher universes—on the way to the top—we can achieve a concordance with the Harold-Kozyrev synthesis.

As part of this general viewpoint, we are inclined to accept the conventional Doppler interpretation of the "red shift", which provides the basis for the "expanding universe" cosmology. But we have also noted that our hierarchical cosmology does not *necessarily* require this "Hubble recession." We certainly would not accept the Doppler interpretation, if this necessarily required also the acceptance of the "big bang" cosmology. We are committed to the concept of an unbegotten cosmos, eternal in time (no point of origin of $t = 0$ in the past); and this turns out to be a kind of modernized version of the cosmology of Giordano Bruno. Therefore—to repeat—we do not accept the idea that the universe *as a whole* started off 15 billion years ago (or any other figure) and that since that epochal event everything has been rushing off into the expanding world.

The supposition that the universe is expanding does not itself present the problem; after all, the advocates of the "steady state" universe also accept the Doppler interpretation of the "red shift" (the Hubble interpretation indicative of "recession"). However, the problem of the *distribution* of celestial materials does seem to present a difficulty to the "steady staters." For example, the thesis of Maarten Schmidt of the California Institute of Technology that quasars were much more plentiful 5 to 10 billion years ago than they are today would, if true, provide a strong argument against the "steady state" hypothesis, which holds that the universe has always looked pretty much as it does now. This is the so-called *cosmological postulate*. For us this has a relative validity.

We are trying to make it clear that one merit of our hierarchical model is that *both the expansionist and non-expansionist theories of the "red shift" are consistent with our cosmology*. We are not necessarily committed to either form, and indeed could accommodate both versions, but in different frames of reference. In our survey of this in *Cosmic Humanism* (Chapter III), we discussed four possible interpretations of the "Doppler effect." And in *Man's New Image of Man* (Appendix I, 1961), we elaborated on Stuart Carter Dodd's ideas (his cosmology is soon to be published in full), and dealt with his acceptance of the explanation presented by F. L. Arnot in his book, *Time and the Universe* (Australian Medical Publications Co., Sydney, 1941), where Arnot reinterprets the formulae of relativity theory *by using the antilogarithm of ordinary*

time. The effect of the employment of the antilog time scale *makes it possible to harmonize the Doppler red shift in the spectrum with a non-expanding universe that is constant in size as well as in its total matter and energy.* But this is at the expense of a slowly changing velocity of light.

Aside from Arnot and Dodd, the only other cosmologist who favors a dual time version of a "steady state" model is Prof. A. E. Milne. In his treatise, *Relativity, Gravitation and World Structure* (1935), Professor Milne proposed a "two kinds of time" scale. I presented my own analysis of and reaction to Milne's cosmology in *Cosmic Humanism* (pp. 127-132), and suggested the desirability of a study of the relations between Milne's and Arnot's viewpoints.

Now, more recently, it is becoming generally known that the Soviet scientist, Dr. Nikolai Kozyrev, has startled the scientific world with his ideas about *time as a form of energy.* This idea is set forth for the benefit of Western students, who may not have access to Soviet literature, in the chapter on "Time—A New Frontier of the Mind," appearing in the volume, *Psychic Discoveries Behind the Iron Curtain* (1971), by Sheila Ostrander and Lynn Schroeder. To what extent Dr. Kozyrev's approach can be assimilated to the Milne-Arnot-Dodd duality of time world view is a matter to be investigated. I presented my own first reaction to Kozyrev's concept of *time-energy* in my article in *UNIBUTZ, Out of This World* (published by the World Institute Council, 1971). Of course, much more study is called for.

The moral of the story up to this point is that in our hierarchical cosmology the foregoing problems of "expansion" are not crucial questions. In this cosmology we recognize that subsystems (galaxies lower in rank than their metagalaxies) may be in different stages of evolution and distribution of components, where this refers to nebulae, quasars, pulsars, "black holes" (see later), and whatever else may be resident in subsystems.

We conclude, therefore, that in terms of existing cosmologies the argument between the "steady staters," the "big bangers," and the "accordionists," can go on for some time; and whatever the final decision, we are at ease. In our scheme, whatever "expansion" and "contraction" there may be, this is not in terms of an overall cosmic time-scale or sequence. In other words, we admit the possibility of both contracting and expanding phases of subsystems within the hierarchical cosmos. In his article, "Arguments Concerning Relativity and Cosmology" (cf. *Science,* 171, 1971, 339-343), Professor Oskar Klein discusses the possibility that the presently conceived expanding galaxy is too small to represent the universe, there being metagalaxies in other phases of evolution, some expanding like our own and some

contracting. So far as I know, this is the first time that an astronomer has clearly recognized this possibility and discussed it.

This line of thought brings to mind the problem of *implosion-explosion* as posed in the discussion in *Cosmic Humanism* (p. 185). And this in turn leads us to the current discussions concerning the place of "black holes" in cosmology. I would especially like to clarify my own notions concerning the place of collapsing stars *(collapsars)* in the hierarchy of *galaxies → metagalaxies → meta-meta-galaxies.* Since this opens up such fascinating lines of thought, let us pause and study the matter more carefully.

II. BLACK HOLES AND THE HIERARCHY

Astrophysicists are becoming increasingly interested in the so-called "black holes" in space. These holes supposedly are created when a star has used up all its nuclear energy (the energy being the product of the transmutation of hydrogen into helium), and then starts to shrink, becoming ever more dense as its own increasingly powerful gravitational attraction causes the star to collapse still further until the imploding gases crush themselves out of existence at the center. Thus the collapsar shrinks itself into oblivion. Such, at any rate, is the theory as explained by Professors Remo Ruffini and John A. Wheeler in their extraordinary article in *Physics Today* (24, 1971, pp. 30 ff.).

First postulated by Dr. J. Robert Oppenheimer and a colleague in 1939, the hypothecated residue of very massive stars whose thermonuclear energy has been exhausted, has not and cannot be directly observed—for no light can escape from such dense masses. There could be indirect verification, however, as we shall see later. If a "flying saucer" were to journey into the vicinity of such a cosmic abyss, it would be drawn into the hole and disappear, and the travelers on the star-crossed space ship would never be able to communicate with the outside world.

In such holes some unusual cosmic phenomena could occur. In complete collapse there would be an actual warping of space and time in the vicinity, so that, could the space traveler but remain alive as he approached the collapsar, he would be sucked into the center of the hole *and would move in advance of time itself,* until he vanished. Such space-warps have been postulated by science fiction writers and parapsychologists, but sober scientists have looked askance at such mental pyrotechnics.

What is especially important for our cosmology is the proposal that "black holes" may provide a preview of the "ultimate destiny of

the universe," as Dr. Wheeler conjectures. Then, after the grand collapse of our universe, a new universe might be born, and thus we come around to the expanding-collapsing-expanding universe—a birth, death, and rebirth cycle that could have no overall meaning in any cosmic sense.

But the question arises: how can it be that the fate of one collapsing star points to the destiny of a collapsing universe—even though Einstein himself so informed us? True, in both cases relativity theory requires the curvature of geometry in the presence of matter, a curvature that increases with the density of matter. Of course, the interchange of space and time is a bit odd—as are some other features—but one can "in time" get adjusted to such conceptual contortions. But that in 70 billion years from "now" the universe itself will collapse into a black hole—perhaps someday to have a "rebirth"—is this not too incredible?

My own guess is that this picture is wrong—or at least incomplete—and that the full story, when it is known, will take us into the higher reaches of the cosmic hierarchy. In some ways the time-energy weld of the "black hole" seems to lead us to Dr. Kozyrev's ideas (more on that in a moment). On the other hand, the notion of Preston Harold concerning the self-sustaining nature of stars and his insistence that the universe will always be able to sustain life—for reasons fundamental to the "single reality" hypothesis—is certainly out of line with the "black hole" debacle. My own escape from this dilemma—once more—is by way of seeking refuge in higher dimensionalities.

We have mentioned the fact that there can be no direct testing of the hypothesis of "black holes." But there are several possible indirect tests. One such would be by way of the confirmation that one binary star may become invisible as its partner disappears into the black hole. One such celestial "drop out" from a pair of stars rotating around a center of gravity and exerting a measurable gravitational pull on its visible partner, pulling material out of it, may be found in the constellation Auriga. But this example is still too uncertain to furnish positive conclusions. And just how Joseph Weber's pioneering efforts at detecting gravitational waves would fit in is also too vague to furnish positive implications and testing.

We have already mentioned Dr. Kozyrev's views about time as a form of energy. Interestingly enough, he has studied double stars and the source of their energies. In his paper on "Physical Peculiarities of the Components of Double Stars" (*Observatoire Royal De Belgique,* Communications Series B, No. 17), Dr. Kozyrev concludes that

it is possible that all the processes in material systems of the Universe are the sources (of energy), feeding on the current of time, which in its turn can influence the material system.

Nowhere in this article does Kozyrev relate his views on double stars to the problem of "black holes"—though of course these are related to each other; but as he does note, his investigations do support his philosophical ideas concerning the "active properties of time."

As of now, it is not at all clear how all this fits together into a "universe." The suggestion by Dr. S. W. Hawkins of the University of Cambridge is that there can be a "collision of black holes" at the center of the galaxy, which then converts the mass of colliding holes into the gravitational radiation that Dr. Joseph Weber and his co-workers have been studying—at a rate 20,000 times the sun's mass every year, so it is estimated. This indeed is some kind of bizarre speculation. For the cosmologist the challenge of the problem is well-nigh overwhelming—especially for the Cosmic Humanist when he also recalls that all the skeins on the loom must be woven into a harmonious pattern which includes the "four forces" of physical science. Most difficult of all, these must also be fitted into the picture of the hierarchical cosmos. Perhaps a basis for this hierarchy of force-fields has already been provided in the section on the "Harmonics of Integration" in *Cosmic Humanism* (see especially Diagrams XXX and XXXIII, pages 200 and 211).

Those who have studied Preston Harold's "cross action" theory as set forth in his part of *The Single Reality* (Book III) know that his explanation of the "four forces" will have to be in terms of the *ratios* of positive, negative, and neutral organizations that are involved in "attraction" and "repulsion" as these build up and emerge in organizations manifestations. This, as we have stressed, also provides the basis for the symmetry aspects of the forces that are exhibited.

Some support for this "proportionality principle" is provided by the thinking of Dr. Abdus Salam, Director of the International Center for Theoretical Physics at Trieste, who seeks a unification of nuclear physics and gravitation through a new type of "coupling constant" which measures the strength of one kind of force relative to other kinds (see the Report on the Coral Gables Conference, *Science News,* 99, April 10, 1971). Somewhat along the same lines, and more important for our purposes, Dr. Stanley Deser offered a picture of the interrelations in which gravitation is capable of becoming a negative or repulsive force at short distances. This would have the important cosmological consequence that there is then a "natural stopping place for the gravitational collapse" that is postulated by the "black holes" hypothesis already discussed.

What is especially interesting in Dr. Deser's view about "negative or repulsive gravity at short distances" is that it hits close to Harold's concept of the role of positive energy in atomic matter becoming a repulsive force as bodies move into close or critical range, i.e., a

"stopping place for gravitational collapse," more of Harold's maximum *vs.* minimum and minimum *vs.* maximum principles?

Eventually, of course, these ideas must be related to the hypotheses about "implosions" and "explosions" cycles, especially as these are involved in the "collapse-expansion" phases of astral realities within the framework of the hierarchical cosmos. Before leaving this phase of the topic, we must reaffirm our own view that any such ladder of forces and structures must be "closed" at the top (i.e., circularly reentrant), if we are to have an overall order and symmetry and interdimensional harmony.

We must emphasize that the concept of the "hierarchical cosmos" is not merely a pot of metaphysical moonshine dreamed up in the brain of a "cosmic humanist." This architectonics was first proposed by the mathematician Lambert in the eighteenth century. The hypothesis is summarized in the monograph by E. Finlay-Freundlich on *Cosmology* ("International Encyclopedia of Unified Science," 1951). There by "hierarchical structure" is meant that stars combine to form star-systems or galaxies; galaxies combine to form super-galaxies; and so on, the elements of the higher order consisting of elements of the preceding rank, and up to infinity. My own version of this cosmology insists that the higher systems exist in higher dimensions, that the hierarchical order stops at eight dimensions, and does not rise to infinity in the vertical order. A discussion of the history of this idea and the supposed objections to it ("Olber's paradox," etc.) is presented in my volume, *The Integration of Human Knowledge* (pp. 353-356), and here the useful expositions of G. de Vaucouleurs are also discussed.

III. "IN THE BEGINNING WAS PLASMA"—SAYS ALFVEN

If the cosmos is bathed in an ocean of electromagnetism, then no discussion of cosmology can be adequate which does not pay homage to the role of plasmas. If also, closer to home, the earth's atmosphere is washed by waves of a vast sea which really are the currents of the solar wind plasma, which cause the variations of the planet's geomagnetics, then perforce we must immerse ourselves, again and again, in this universal ocean. Therefore another dip into the waters of life!

Scientists today know something that their predecessors did not, namely, that *space is not empty.* Our planet, the solar system, the cosmic spaces—all are surrounded by and immersed in plasma and constitute a fourth state of matter beyond the *solid, liquid,* and *gas* states. Interstellar space is a plenum of plasma. This abundance of

discoveries has given the scientists in various fields marvelous tools the use of which promises the unification of formerly diverse disciplines, such as ionospheric physics, astrophysics, and thermonuclear physics. Thus the influence of plasmas is evident in cosmic space, inside the stars, the sun, and the earth's central core. Beyond that, Cosmic Humanism seeks to discover and utilize the biological and psychological potentialities of plasma.

The term "plasma" was employed by Irving Langmuir in 1929 when he introduced it to refer to ionized gas composed of electrons and positive ions.[1] Today, beyond what Langmuir was familiar with, it is now possible to study the behavior of plasmas in terms of electron density and the collision frequency with other particles. In recent years a great deal has also been learned about the plasma state by using high frequency radio waves as "probes."

It is now known that plasmas are either transparent to electromagnetic waves, or non-transparent, as the case may be, according to what is called the *plasma frequency*. The formulation of the mathematics of the transition gave an equation in terms of which it became clear that the same mechanism which prevents radiation from emerging from the plasma also prevents outside radiation from penetrating into it. A completely ionized ("high density") plasma may emit no radiation whatsoever. The transition from a gaseous state into the ionized state involves the use of a large amount of energy.[2]

As studies broadened, it became possible to relate these electric wave phenomena to quantum physics. One writer, T. L. Eckersley,[3] translated this "critical frequency of the medium" into the duality of the "group" and "phase" velocities, as follows:

A Quantum Relation in Large Scale Electric Wave Phenomena.

It is well known that associated with a medium containing free electrons of mass m and charge e there is a definite critical frequency ν_o where $\nu_o^2 = \frac{Ne^2}{\pi m}$

This frequency is characterised by the fact that electric waves of frequency less than ν_o cannot travel through the medium.

The group and phase velocities of waves of greater frequency than ν_o are given by the relations:

$$V_{\text{phase}} = \frac{c}{\sqrt{1 - \frac{\nu_o^2}{\nu^2}}},$$

$$V_{\text{group}} = c\sqrt{1 - \frac{\nu_o^2}{\nu^2}},$$

so that they tend to ∞ and 0 respectively as: $\nu \to \nu_O$.
This relation:

$$\nu = \nu_O \text{ or } \frac{Ne^2}{\pi m \nu^2} = 1,$$

which determines the critical frequency of the medium, can be expressed in a way which connects it up with the quantum theory.

This is important for our own studies of the behavior of radiation in plasmas as well as for what was once called "free space." What makes the speculations especially intriguing is that in some situations both *longitudinal waves* (e.g. sound and phonon phenomena) and *transverse wave trains* (e.g., light) are possible. The mathematics of this is complicated.

Among the fascinating lines of research is the study of the effects of external magnetic fields on plasmas. There are several types of effects to be observed. One is the ability of such fields to exercise control over plasmas so that *there is no need for guidance control by material walls*, i.e., the plasma is constrained to move along lines or "strings" of force, whether these envelop the stars, the sun, the earth. The fact that a magnetic field can confine charged particles through interstellar and intergalactic space has important consequences, especially since such lines of magnetic flux are so pervasive. When this is related to what is known as "cyclotron emission" (see later), one sees that the understanding of cosmic phenomena depends in a large measure on progress in plasma research.

One of the most interesting types of waves is in the field of magnetohydrodynamics, more simply referred to as Alfvén waves. Here we see how the plasma field and the electromagnetic field are two systems in close interaction. Each exerts a force in determining the behavior of its associate, and which will prevail—the field or the plasma—is determined by the situation. In the Alfvén wave the magnetic field usually dominates. Knowing that fact, one wonders, of course, which came first—the field waves or the plasma? The answer to this cosmogenic question is wrapped up in the riddle of the origin of the cosmos—and that is still something to be unfolded.

IV. COSMIC RAYS AND CYCLOTRON RADIATION

Among the problems now being studied by the astrophysicists is older conundrum of the origin of "cosmic rays," those highly penetrating "rays" that come from outer space to penetrate matter on earth, explode atoms in the human body, and perhaps incite

mutations in the genes which spur on the processes of biological evolution.

It has been suggested that cosmic rays come from supernova or exploding stars within our own galaxy; but it is also possible that those with the highest energies may come from sources outside the galaxy—from extragalactic space.[4] The ingenuity shown by astrophysicists in inventing theories of the origin of cosmic energies is astonishing. The energies of quasi-stellar radio sources baffle the human mind. Many of these radio sources are brighter than a billion suns, and so the astrophysicists speculate about "colliding galaxies," "cataclysmic chain reactions of supernova explosions," "quasars collapsing inward under tremendous gravitational force"—only to be blown apart again to produce celestial fireworks, or be crushed out of existence completely.

Perhaps one of the most amazing discoveries was the one mechanism for generating cosmic energy by way of fluxes of relativistic particles, that is, particles moving with nearly the speed of light. In accordance with known relations embodied in Einstein's theory of relativity, radio sources are emitting energy by what is known as the previously mentioned synchrotron mechanism—radiation from relativistic electrons spiraling along lines of magnetic force.

This has many interesting aspects. Among them is the fact that radio emission from our galaxy confirms the presence of large-scale magnetic fields, as previously mentioned. Indeed, this has verified the *galactic halo*. Now the problem of the origin and nature of this "halo" at the center of our own Milky Way is the focus of much intensive study.

Another important property of synchrotron radiation is the high degree of polarization exhibited by its radio spectrum. This may explain the "glowing" region of the Crab nebula—possibly of supernova origin—where a magnetic field comparable to that which generates our own galactic halo may be operative.

The recent discoveries of sources of prodigious energies in "radio stars" may supply another piece for our picture of biological evolution here on earth. In our own speculations in the field of "cosmecology" (in 1937), we suggested that the cosmic rays that incite mutations could have their origin within our galaxy, *or the origin could lie outside our galaxy*. Today this idea of extra-galactic sources of radiation may have a double interest: not only because it may bear on the origin of the intensity and periodicity of cosmic ray influxes (from directions related to galactic rotation as related to extra-galactic agents), but also because the fact of extra-galactic influences may in some measure tend to confirm our hypothesis of

the hierarchical cosmos, with a ladder of lenses orthogonal to each other in the hierarchy. It has recently been announced (1971) that there are extremely powerful sources of X-rays in deep space, trillions of miles beyond the Milky Way. The constellation known as Perseus A produces X-rays of an energy of 10 trillion stars the size of the sun. True, it may not be necessary to go that far out into space to locate the source for radio-mutations here on the earth. Even the earth is radioactive.

In a moment we shall consider the biological aspects of astrophysics, with a closer look at the role of "magnetic resonance." Before that, however, let us turn to the broader problem of the possible origin of life in the extra-terrestrial space of our galaxy.

V. LIFE: A COSMIC ACCIDENT?

From time to time we have paid homage to Pythagoras of old. We believe that his pantheistic philosophy was sound, of course, but he couldn't reach far enough into space and time to see and hear the "music of the spheres" (Lenses) in galactic contexts. If by his own theory of metempsychosis he should return to pursue once more his cosmological journeys, *we Cosmic Humanists wish him God speed*—at superlight velocities!

And having thus mentioned metempsychosis, what implications emerge from the startling findings concerning the seemingly universal and everlasting prevalence of "life" in the universe? Since, as Cosmic Humanism views it, "life" and "mind" properties are inherent in the galactic hydrogen-helium field, this matter is important.

Scientists were understandably surprised when their radio telescopes revealed the presence in galactic space of organic compounds—formaldehyde, for example. But it was especially astonishing to find that hydrogen cyanide (HCN) was issuing from the center of the galaxy.

The meteorite that crashed into the earth at Victoria, Australia, in 1969, added an extra measure of surprise when it was discovered that the amino acids in the meteorite were an almost equal mixture of right-handed and left-handed molecular structures. Amino acids of biological origin here on the earth which contain the proteins so essential to life, are left-handed, i.e., levo-rotary, in the sense that they rotate a ray of light in that direction. This is due to the crystalline structure of the substance. This means that the acids found in the meteorite must be of extra-terrestrial origin, brought here perhaps by a meteor that came from the asteroid belt of our solar system. The two types of amino acids are chemically identical, but their optical properties are different.

The implications of these discoveries of complex organic compounds (hydro-carbons not of earth-origin) are several:

1) They present strong evidence for a theory of chemical evolution in outer space;

2) they suggest the probable existence of life elsewhere in the universe—either perpetually existent or a product of the above chemical evolution;

3) they may throw light on the time-pattern for the origin of life here on the earth and elsewhere in the universe.

What it all means is a riddle still to be unravelled.

What gives this problem of the source and nature of organic compounds such a superlative interest for us is that the "hydrogen bonding" mechanism is crucial for an understanding of the genesis and nature of consciousness. It is a fact of chemistry—or so we have surmised in our UNIBUTZ article—that the basis for information per se in biophysical signal detection systems is to be found at the atomic (not molecular) level in the hydrogen protons that are suspended in the protein C=O—H—N system, the hydrogen bonding system. This is associated with spin, precession, and the like, of atomic constituents, with respect to orientations, magnetic moments, and polarizations. This notion of the biological frame of spin, precession, magnetic moments, orientations and polarizations in geometric patterns, then allows us to move up to the biophysics of the *cortex cerebri* and speculate on the human brain as a laser-like instrument of the mind that produces holograms through its "interference patterns." Reasoning by analogy, one can then seek out the homomorphic images residing within the hydrogen-helium plasma of the galactic field. Thus the feed-back between cerebral cortex and the earth's heliosphere is part of the bipolarity that unites man and galaxy in cosmic consciousness. *This synchronization or resonance is made possible by the hydrogen bonding system of carbon compounds.*

Of course, what is obviously necessary is a more complete knowledge concerning the mechanism of chemical bonding. The various factors governing the phenomena of chemical bonding, atomic and molecular, are known. According to current theories, an atom has a shell (or shells) of electrons revolving around a central nucleus—how many electrons and how many shells depending on how simple or complex the atom is. In bonding these valence electrons may be shared by the protons in the nucleus. The "attraction" behind the sharing is like a sexual craving, and the interpenetration and sharing of electron shells satisfies this craving.

Here, as elsewhere, there is a kind of conflict going on—a war

between the vibrations that keep the constituents apart and the magnetic forces that draw them together. To have stability, the counter-acting tendencies of attraction and repulsion must be balanced. This seems to illustrate the Hegelian-Marxist formula of *thesis → antithesis → synthesis*, or the *cross action* formula of Preston Harold, namely, *organization → disorganization → reorganization.* Aside from the factors of electronic spin, magnetic fields, and the rest, there is also—if synthesis is to occur—the sheer fact of relative velocities. If atoms in space are moving at high velocities, they cannot latch on to each other and dance together.

In terms of intellectual constructs, the problem of chemical synthesis, from *atoms → molecules → cells* is enormously complicated, and we cannot hope to do justice to it. The fact of the matter is that the mechanism of even the simplest chemical reaction is not well understood, not to speak of the manner in which the chlorophyll of plants is able to synthesize organic compounds like the starches and sugars.

VI. HYDROGEN: THE STUFF OF CREATION

Students of science are not yet able to reveal the plot which underlies chemical synthesis; but they believe that it involves electron spins, orbital wave functions, nuclear spin resonances, and other exotic operations.[5] Our purpose here is to assemble what we know and apply this knowledge to the grand problem of the place of life in the cosmos and, if possible, confirm Cosmic Humanism's thesis that the cosmos endlessly supports life systems. When we understand the plot more fully, we surely will verify the idea that hydrogen "bonding" is the heart of the matter—the beginning of what is destined to develop into the cellular structure of living organisms. When hydrogen teams up with carbon and other elements to make formaldehyde and the rest, we see how nature has her "eye" on the synthesis of amino acids, proteins, the DNA-RNA helix, and the protoplasms. Of course, behind this there is, *for us,* the more ultimate problem: how does the hydrogen-helium galactic field or plasma undergird this, even to the manifestation of mind on the human level?

To digress for a moment: there is a theory offered by the workers at the University of California laboratory that the mysterious flashes seen by the astronauts are caused by the helium ions and neutrons passing through their retinas as the astronauts journeyed through space. This, however, is theory. But such doses of nuclear particle radiation could well stimulate the central nervous system. None the

less, the suggestion that the cause of the flashes may be the Cherenkov effect, which occurs when particles traveling near the speed of light enter a dense material (fluid of the eye), is indeed something surprising. That "superlight velocities" should produce supersonic shock waves in a perceiving organism—that surely is "shocking!" Does it indirectly support our hypothesis about the bipolar Helium Psychosphere?

In our discussion in *Cosmic Humanism* (pages 427-428) of the problem of the origin of the double helix of the DNA-RNA macro-molecule we pointed out that the bases of the four nucleotides (the "letters" of the "alphabet of Life") are stacked in planes somewhat perpendicular to the long axis of the helix. These planes are the rungs of the helix ladder. The two chains of the ladder (see diagram on page 425) are held together by the hydrogen bonds. Mutations supposedly are due to shifts in the units of the hydrogen-bonded chains. So for us the problem is that of finding the causal link between the morphogenetic field of the hydrogen atoms as a bonding unit of organic synthesis and the presumptive guiding field of the DNA-RNA helix. This, I suggest, is a case of orthogonal synthesis via electromagnetic spinors. If this be the case, it then turns out that the *scalars → vectors → versors → tensors → spinors → lensors* paradigm is much more than a figure of speech. But how can a spinor coerce a tensor? And is this force a *vis a fronté* or a *vis a tergo*—or is it possible that these are only two ways of looking at the same phenomenon, something like a mirror effect induced by circularly polarized light?

There is, however, an even more mystical-alchemical way to look at this. Hydrogen might be thought of as like unto *Aleph* of the Kabala: the first letter of the alphabet of the Hermetic language—the point in space that contains all other points—and Cantor's symbol for transfinite numbers. Or should we think hydrogen-bonding is like that of the angel of Ezekiel's vision that faces North, South, East and West, at one time?

In a sense, this panopticon reception is correct, for the evidence for the existence of celestial hydrogen comes from all directions of space. The panorama is breath-taking. To glimpse the action, we must pause for a moment and survey the scene.

VII. EXISTENTIALIST COSMOLOGY AND HARMONY

Atomic hydrogen is the simplest of all chemical elements, consisting of one electron revolving around one proton at the center. In the cosmic realm hydrogen announces its existence in several ways. In

the first place, it is known through the series of atomic spectral lines of the hydrogen atom in the Balmer series, something that is illustrated diagrammatically in physics textbooks (see also *Cosmic Humanism*, p. 204). Here the emission of light is from the atoms as the electrons jump from the outer to the inner orbits, thereby producing the lines in the spectrum that correspond to the quantum jumps.

One of the most amazing predictions in the history of astronomy arose out of this "existentialist" behavior—"to exist is to assert one's self." In the year 1944 the Dutch astrophysicist Von Hulst made the brilliant prediction that the hydrogen atoms in space should be giving forth 21-centimeter radio waves that could be picked up by radio telescopes. When later the observations were undertaken, the celestial hydrogen waves (1,420 megacycles) were indeed discovered. From the jumble of radio noise that comes from the Milky Way a single significant note was "heard." So now we know that cosmic space contains hydrogen atoms that sing a celestial song!

And while we are out in space, and still thinking of the personality of hydrogen as a syntropic partner, let us also note that this same charisma appears in the metals-to-hydrogen ratio as evidence of nucleosynthesis. Too, hydrogen's affinity for ferromagnetic grains in interstellar space is significant, for the grains are very magnetic and are responsible in part for the polarization of starlight.

Another and intricate method of learning about the structure and behavior of the hydrogen atom is through the study of the so-called "hyperfine" effects as these are correlated with the particle spins inside the hydrogen atoms. Both the electron and the proton in the hydrogen atom are like tops or gyroscopes—they spin on their axes, and the relation between the two spins is responsible for "flips" that electrons undergo. What makes this peculiarly interesting is that such spin phenomena have applications in the realm of biology, as we shall see.

This new line of investigation—generally viewed as the most important contribution to physics in the 1960s—was given its initial impetus by the research of Dr. Brian D. Josephson, Nobel Laureate. Dr. Josephson's work is based on the study of the macroscopic interaction between two superconductors. Here he was concerned with the cooperative effect of passing electron pairs through a very thin layer separating two superconductors as these were observed in superfluid helium. Strangely enough, there has already been speculation that some stars are superconductors that participate in such processes; and next it began to appear that DNA and other organic molecules may also have superconductive and superfluid properties.

We must say a few words more about this.

If we were to put this development in its proper technical context, we would note that, as already indicated, we are here on the trail of the "fine structure constant," the fundamental constant for electromagnetic interaction. The importance of this for quantum electrodynamics has been made especially clear by Dr. P. Kush in his paper on "Magnetic Moment of the Electron" (*Science,* 123, 1956, 207-211). This constant is derived from the study of the radio frequency of the spectra of hydrogen and deuterium (heavy hydrogen). The quantitative value of this coupling constant is 137 (approximately), a figure which, we may note in passing, had an almost magical significance for Sir Arthur Eddington in his unitary scheme of cosmology.

Perhaps the most fertile application today of the foregoing investigations is that it opens up a method for determining the ratio of E/h—the basic "fine-structure" of quantum electro-dynamics. The quantity represents the *ratio* of the spin axis precession frequency of the proton in the magnetic field of a hydrogen atom to the orbital motion in the same field. As already indicated, that spinning particles will "precess" like spinning tops, their axes of rotation slowly moving around a cone, like the earth on its axis, or the solar system ecliptic through the plane of the Milky Way—this surely is one of the great discoveries that should stimulate man's sense of awe and mystery. That it should also help to unify physics and biology in a higher synthesis is another reason for wonderment.

But there is more to come. In order to take the next step on our journey we must look to another and seemingly unrelated topic—the subject of "Brain Waves," no less. First, however, we must turn our attention to something equally fascinating—the field of *solar system resonance,* which we now consider.

VIII. SOLAR SYSTEM RESONANCE, THE GALACTIC AURAMETER AND THE *DNA-RNA* HELIX

In our ongoing presentations of the developing philosophy of Cosmic Humanism we have made the point that in order to solve the problems that relate to "cosmecology," we must find the answers to some high-level questions: how to interrelate the galactic plasma rhythms, the solar winds, the earth's pulsing heliosphere, ionosphere and magnetosphere, the DNA-RNA helices, and the alpha waves of the human brain. Quite an order! But as we progress in our understanding of these interconnected phenomena, we will be on our way to comprehending what man is, how his evolution is related to the "Cosmic Imagination," and what mankind's fate may be.

The most recent problem we have come upon may—at first sight—seem quite unreal: how to tune the "cosmic alphaphone" and receive the "World Sensorium" messages *(wholingua)* of the global cogitatorium. Hopefully all this will begin to make sense as we continue our studies. In a moment I shall turn with you to a consideration of that latest scientific tool, the alphaphone. But to understand that we must first outline the nature of the so-called "brain waves" of the human organism.

Brain Waves

It is now generally agreed that there are four sets of human brain waves issuing from the living brain. These brain waves can be measured by the EEG (electroencephalogram) as tracings on ribbons of paper. These types are:

1) *Alpha brain wave*—frequency of 8-12 cycles per second.
2) *Beta brain wave*—frequency of 13 to 30 cycles.
3) *Delta brain wave*—frequency of 0·5 to 3 cycles.
4) *Theta brain wave*—frequency of 4 to 7 per second.

The *alpha rhythm* is the rhythm given off when the subject is awake, but relaxed, with the eyes closed. This rhythm can be controlled by the use of feedback techniques (such as the "alphaphone"); the *beta rhythm* is identified with the state of mental concentration; the *delta rhythm* occurs in sleep; and the *theta rhythm* is linked to creativity. As with other "waves," one can translate the above frequencies into wave lengths by way of the familiar equation: $\lambda = C\frac{1}{f}$; which are then designated in terms of Hz (Hertzian cycles).

The alphaphone is a novel instrument of human experimentation. Perfected by Dr. Joe Kamiya of the University of California School of Medicine, the alphaphone is a cybernetic feedback device (a kind of sophisticated "head set") which enables an individual to listen in on his own brain waves (the alpha rhythm) and learn to control them to the point where he gains some mastery, not only of the inner world of the psyche but also of the autonomic functions of the body. Like "transcendental meditation," alpha is a tool for cultivating mental and physical health. Thus, in the tradition of Zen and Yoga, alpha training promises an elevation of consciousness, inner serenity, and facilitation of the learning process. In a euphoric mood, some news headlines have proclaimed that "people with a yen for Zen are linked to the wave of the future"; that this "turning on without drugs can produce the electronic high that can replace the use of psychedelics"; and so on.

Another remarkable development is reported by B. L. Collier in his article on "Brain Power: The Case for Bio-Feedback Training," in

the *Saturday Review* (April 10, 1971), where it is announced that when the brain waves of a musician are fed into a computer and a synthesizer, there can be produced a weird but not unpleasant concert. If, someday, experimenters are able to transpose these sound effects into visual experiences, the resulting synaesthesia might rival the "clavilux" symphony of Scriabin's *Prometheus?* Given that, I would wonder whether this could be adapted to the potentialities of *Prometheus-Krishna* as a United Nations communications satellite system for global radio and *ETV.*

Now let me carry still further this line of innovative speculation by proposing that the mastery of such technologies could constitute the first step toward learning how to orchestrate the "cortical dissonance" of the "planetary brain lobes"—to adopt the terminology I have employed for several decades—the resulting music of human consciousness thus being attuned to the galactic wave field in the form of what Maurice Bucke called "cosmic consciousness." The generation of this synergic consonance is part of the technology for the evolution of the *World Sensorium* (what Teilhard de Chardin terms the *Noosphere*).

We have tried to sketch the next steps in human evolution. One preview of the world-view was outlined in my article, "The Cosmic Lens, the Galactic Disc and Archetypal Holograms," as this appears in the symposium volume, *UNIBUTZ, Out of This World* (World Institute Council; 1971); another in my article, "Man's Image of the Galaxy" *Maitreya,* 1971, 71-78. In these two articles I have tried to show how human beings, immersed in the galactic hydrogen-helium field, may utilize the pulsing feed-back between man and the galaxy to build up the emergent Psychosphere.

The proper vehicle for this higher energy plenum (plasma?) of interactions is still to be explored. One student, A. M. Molchanov, is investigating what he terms the "Resonant Structure of the Solar System," and he sets forth his findings in an article under that title in *Icarus* (Academic Press, 8, 1968). The next development in this line of thought comes from Mr. H. Prescott Sleeper, Jr., whose earlier essay along these lines appears as an Appendix VI in my book, *Cosmic Humanism.* Mr. Sleeper thinks there is a correspondence between these solar resonances and the Alpha, Beta, and Theta brain waves. I am dubious about at least one aspect of Mr. Sleeper's interpretation of the findings, namely, in my view the frequency resonances probably hold between the brain's action patterns and the Helium Psychosphere—not the ionosphere, as Sleeper urges.

One shortcoming of Mr. Sleeper's fascinating hypothesis is that he provides us with no discernible bridge connecting the solar system resonances and the brain frequencies. It seems to me that the bridge,

if there be one, must reside in the DNA-RNA helix. And if, somehow, the earth's heliosphere (the circumglobal helium shell) comes into the picture, this assuredly will help to complete the total picture. I am now intrigued with the possibilities along these lines, especially by the fact that there are four helium cores and the same number of postulated units of the planetary DNA-RNA "radiation belts of thought," as described in Diagram LII, page 463, and Diagram LIV, page 465, of *Cosmic Humanism.*

As previously noted, there are four "nucleotides" in the double helix of the gases. There are four helium cores. But there are four types of brain wave frequencies. How, then, can there be a causal connection, at least of a one-to-one concomitance? And how can the resonant frequencies of the solar system correspond to the brain frequencies, if these in turn correspond to the core wave patterns of the heliosphere? Such a four-layer correspondence goes far beyond what is posited in the Hermetic-Swedenborgian doctrine of correspondence, "as above so below." And yet something like this is required to confirm the macrocosm-microcosm analogy.

According to the hypothesis, mental (thought) wave patterns are made possible by the four types of nuclei that are exhibited in the four kinds of spontaneous decay, and these are posed as possible "inorganic" precursors to, or perhaps parallels of, the four components of the DNA helix. But where can one find any causal nexus, except for the quadruple character of each? If, however, in our "cosmic humanism" we are to find a causal connection beyond mere numerology, we will need to discover if, and how, the same four nucleotides of the DNA helix get from the level of biochemical phenomenology of the gene helix to the DNA-RNA chain placed around the globe as the spiral of planetary embryogenesis. We have struggled with this before, and, as already indicated, the hydrogen bonding synthesis must play a key role. We cannot turn our back on this ineluctable riddle.

With respect to a fifth, and still missing, frequency of brain waves, could it be that it is "missing" because it is still to come? Could it be that there is a master rhythm yet to emerge? If so, will it be in the upper harmonic brain waves of the ensemble of human beings—something not to be found in the cerebral cortex of the individual's lobes, but manifest in the form of what we have termed the "planetary electroencephalograms" of the evolving world organism?

In our version of the embryogenesis of the World Sensorium (or Noosphere), we have proposed that human beings are the neuroblasts of the planetary brain lobes of the Eastern and Western hemispheres—the global *cortex cerebri.* In that case, the wires of the rotating earth armature are in literal fact spinning out the patterns of

the planetary electromagnetic society (far beyond what Marshall McLuhan has envisioned), and we humans are like the electronic tubes in the evolution of the World Sensorium. And here is where the global DNA-RNA "radiation belts of thought" must be hooked into the heliosphere. Moreover, if it turns out that there are "intelligent beings" in other, extra-terrestrial, systems who are on the basic DNA-RNA code of the cosmic alpha (alphabet), they will have frequencies transposable into human brain wave frequencies, and they, too, can share in the phanograms transmitted by the galactic alphaphone.

As I look back over our repertoire of concepts, the following arrows are available in our quiver of ideas: *atomic helium* → the *circumglobal heliosphere* → the *DNA planetary spiral* → the *galactic hydrogen-helium plasma* → the *Psychosphere.* In trying to find the missing links between atomic helium and the DNA, we Neo-Pythagoreans will be tempted to experiment with the possibility that the geometry of the classical *Platonic solids* may play a role. The nexus here is not clear and may be quite illusory. But we must have a look at it.

In thinking about this baffling mystery, I recalled the statement of Prof. H. M. S. Coxeter in his masterly work, *Regular Polytopes* (1947), that the tetrahedron, cube, and octahedron occur in nature as crystals, but that the two more complicated regular solids cannot form crystals, "but need the spark of life for their natural occurrence" (as Coxeter so beautifully puts it on page 13), and so the sea animals called radiolaria provide perfect examples of icosahedra and dodecahedra. Plato inherited the idea of these five regular solids from Pythagoras (and so they are termed the *Platonic solids*) and these regular solids in turn provided the geometrical basis for the later development known as the *theory of groups* and the more ambitious excursions into hyper-dimensional spaces, with analogous figures and symmetries in four and more dimensions.

All this may seem like a very tenuous fabrication, but as it happened, at the same time I read Linus Pauling's article, "The Close-Packed-Spheron Theory of Nuclear Fission" (*Science,* 150, 1965, 297-305), and discovered that the arrangements of *spherons* (nuclear constituents roughly spherical in shape and spaced in concentric layers) are according to Platonic solids (at least the tetrahedron, the octahedron, the icosahedron) and that "resonances" enter into the dynamics of nuclear properties.

Of course, we still do not have the picture of the connections between nuclear cores ("helions" is Pauling's term for "spherons") and the helium in the sun, the heliosphere around the earth, and the hydrogen-helium plasma of the galactic disc. Least of all do we see

how helium can assist in the synthesis of the DNA-RNA double helix, though we do know that hydrogen, the bonding element, can also be transmuted into helium and is, therefore, in that respect a precursor of helium. But, of course, there is no *known* biological alchemy that functions in the living systems of the organic kingdom to bring about the transmutation. It happens, however, that a French worker, Mr. C. Louis Kervan, has authored a book, *Transmutations Biologiques,* in which he claims to have produced experimental evidence that the human organism can transmute one element into another. This, to my knowledge, has not been confirmed by other scientists.

Aside from that, the fact that, on another level, I have converted the double helix into a planetary spiral presents no problem of topological transformations, for when the helix winds around the whirling earth-armature and its bipolar electromagnetic field the helix is transformed into a spiral.

To learn whether all these fanciful imaginings can have any basis in fact and truth we must next discover how to encephalize the globe—proliferate the functional World Sensorium and discover whether the higher alpha resonances do come forth. This, of course, brings us back to our long-standing problem of how to convert the power of resonant thought into the guiding field and vehicle for the embryogenesis of the global sensorium or noosphere.

Do you get the message? Are you with me on the alpha beam? If not, we must explore still further.

IX. MAGNETIC RESONANCE AND HELICITY

One difficulty facing the theorist who conceives of philosophy as a speculative synthesis of the sciences is that the job is never completed: novel "breakthroughs" are always cropping up that present new challenges. In contemporary astrophysics some of these new discoveries are breathtaking.

Part of the conceptual difficulty comes from the fact that science is trying to deal with novel phenomena by employing an old and perhaps obsolete language to conceptualize new data. Sometimes the only recourse is to apply the old terminology metaphorically when originally it had a literal reference. For example, we have a good bit to say about "spin" in electronic, atomic and molecular action-patterns. In some instances "spin" is taken as an "honest-to-god" fact; and in other cases the term is used analogically. Someday physical science will possess a unified language for the description of phenomena—but that time is not yet. Meantime we do the best we can.

In Cosmic Humanism we are much concerned with "magnetic resonance," "helicity," "mirror images," and a host of related phenomena, some of which are new and some of which—thanks to the projective symbolism of the Cosmic Lens—are familiar. Let us consider first the virtues of magnetic resonance.

For us, the discussion of the phenomena of waves in plasmas or ionized gases already is "old hat." We have paid attention to the wide variety of different wave train lengths and wave train types (transverse, longitudinal, and both together in the same plasma). One of the newer areas of research to be opened up is what is known as "solid-state plasma physics." Studies in this field have been especially fruitful in the case of the light alkali metals, especially sodium and potassium.

In this domain the phenomenon of spin-wave excitations makes itself manifest. In ionic lattices there are electron/phonon couplings. This is something exotic in science. But not to ignore previously established knowledge, let us keep in mind that our old friends, the *group* and *phase* velocities of wave trains are on occasion also to be taken into account.

Least of all to be overlooked in this enrichment of phenomena in solid state physics are the *circularly polarized* electromagnetic propagations. Because the electric (or magnetic) field vector traces a spiral path in metals, it is known as the *helicon.* This is similar to the radio-audio frequency termed "whistlers" that travel through the ionosphere along the earth's magnetic flux lines.

Ordinarily the notion of "helicity," at least as we have been considering it, is limited to the realm of the inorganic. But quite remarkably, spirals and helices also occur in the realm of living phenomena, and some sort of synthesis of the two domains is coming into view. Aside from the dramatic discovery of the double helix of the DNA-RNA couple in genetics—to which we have genuflected (the "lotus" position of the Yogi resembles it)—there is also the older field of the optically active organic compounds where "rotations" of light rays are important. The original investigations are connected with Louis Pasteur and his studies of the levo-rotary properties of proteins. However, dextro-rotation of light also occurs, as we shall see later.

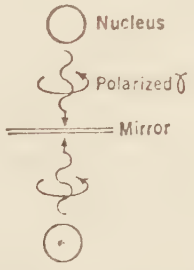
Today these researches introduce the model of optically active molecules as proposed by Drude, who postulated that an optically active molecule contains an electron *which is coerced into a helical path by an electric field.* This is especially fruitful—if the model is correct—because this can be related to quantum mechanics, a synthesis which is much to be desired.[6] This one-handed helicity is maintained in intermolecular transport through protein molecules.

This provides the spring board for the next leap—to span the hiatus that supposedly separates metals and protoplasmic systems. With more time and study the gap will be bridged. Indeed, there is a class of compounds consisting of organic molecules sandwiched between metallic layers.[7] This is of interest to us because, if applicable to our developing synthesis, it demonstrates that superconductivity can take place in structures that are two-dimensional and, more important still, *this superconductivity represents an interaction between electrons and organic molecules.* This takes us back to Drude's model, *which in turn twists us into helicity.* But how does one get from two-dimensionalities to third dimensional structures?

That nature does "get to that" is clear enough. An excellent picture of protein molecules arranged around an axial core in such a fashion as to visualize the helical coil is given in an article on viruses.[8] Among the interesting side-lights here is the manner in which the protein units of "spherical viruses" can be packed symmetrically in accordance with a pattern of cubic symmetry. Once more we are back to Pythagoras and the Platonic solids!

In all these images we have examples of the way in which the subjective frame intrudes into the objective picture. It is noteworthy that in the case of the neutrino and the anti-neutrino the question of *spinning* depends on whether the particle is moving away from the observer, in which case the spin is counter-clockwise, or whether its motion is toward the observer, in which case the spin is in the manner of a right-handed screw.

And in the case of the photon, there is an analogy for this: photons spinning clockwise when approaching an observer are seen as rotating counterclockwise (just the opposite) when viewed on the other side, i.e., via a mirror. The phenomenon is important since it is related to polarization.[9] We cannot go into the details here, but a visual diagram of it is as follows:



In the emission of polarized gamma photons from unpolarized nuclei, the photons spinning clockwise when approaching the observer would be seen as rotating counterclockwise by an observer on the other side of the mirror.

In order to exhibit the relevance of this to the kingdom of the biological, permit me to quote from an article by Henry Eyring on *This Changing World* (*AAAS Bulletin*, September, 1965). This scientist, at that time President of the AAAS, put the matter as follows:

THE *l*-WORLD WE LIVE IN:

Many molecules are indistinguishable from their images in a properly placed mirror. Such molecules are said to possess a plane symmetry. Other, left-handed molecules look like right-handed molecules when viewed in the mirror, just as the mirror image of one's left hand is a right hand. This latter type of molecule has no plane of symmetry and is said to be asymmetric. When mixtures of left-handed and right-handed molecules dissolved in solution crystallize, they usually separate into two types of crystals which are mirror images of each other, as Pasteur discovered. The molecules are said to be resolved by this crystallization into their optical isomeres.

If a chemist goes into the laboratory and synthesizes an asymmetric molecule, he gets equal amounts of the *l*-and *d*-isomeres (dextrorotary). This is in contrast to the living world, where one finds that only *l*-amino acids and *d*-sugars are used in the protein structures and chromosomes, respectively. This use of only one of the optical isomeres holds true for almost all the other asymmetric molecules in living systems.

If our *l*-world could be sent through a mirror and thus transformed into a *d*-world, it would proceed exactly as efficiently as it does now. If life is found on Mars, it will be interesting to know whether it uses *l*- or *d*-amino acids in its proteins.

Since Professor Eyring made this statement, amino acids found on the meteorite from outer space that landed in Australia have been found to contain both types of optical isomeres. We have already indicated the implications wrapped up in this discovery.

A complete synthesis, enfolding a unified body of concepts and laws, would seem to require that spirality and helicity in relation to electromagnetic radiation—including circularly polarized light and mirror-image complementarities—should have a solar system and galactic background.

There is some evidence for this. On the first level (solar system) there is the evidence of an interplanetary magnetic field, which may be pictured as an Archimedean spiral, according to Prof. E. N. Parker.[10] This same scientist (Eugene Parker of the Institute of Nuclear Studies at the University of Chicago), moving from the solar system into the galaxy, has also proposed a new theory of how stars are born. He theorizes that cosmic rays, traveling almost at the speed of light, distort the magnetic field that permeates the galaxy so that gas particles are pulled off the magnetic peaks and, coerced by gravitational attraction, run down into deep valleys and coalesce with other particles to make gas clouds—and then the process of stellar birth is under way.

In our own formulation these "gas clouds" will have to be explained in such a way that the hydrogen spewing out from the central galactic halo is churned into a spiral vortex and polarized within the plasma associated with synchrotron radiation. All this is indescribably complicated, at least in terms of present modes of thought. We need to know more about the cosmic lensors that control the spinors, that guide the versors and the vectors, and so on. Quite possibly the total picture is one of spirals within spirals—helices within vortices—inversions and whorls up to the seventh heaven!

X. THE MULTIPLE FACES OF HELIUM

It is not difficult to fall in love with the various "faces of helium." This is especially the case when the shining countenance has to do with the evocation and universality of organic matter in the galaxy. We touched on this topic earlier and now return to it. To develop some further implications, it is necessary to bring in some ideas that are set forth by Mr. Andrew A. Cochran in his article, "Relationships Between Quantum Physics and Biology," (*Foundations of Physics,* I, 1971, 235-250).

Here he asserts his major thesis as follows:

> If the quantum mechanical properties of matter are actually the conscious properties of matter, then one would predict that in all phenomena where quantum wave explanations are important, the phenomena could be interpreted better in terms of consciousness. For example, as the wave aspects of matter are strongly predominant near absolute zero of temperature, one would predict that the consciousness of matter would be more evident at such temperatures.
>
> Is this true? When liquid helium (the abundant isotope of mass 4) is cooled below 2·18°K (Kelvin), strange new properties appear that are not found in any other liquid . . .

Mr. Cochran points out that the properties of liquid helium when supercooled are so remarkable that it is considered a fourth state of matter (plasma). Parenthetically, and because of its uniqueness, I am tempted to propose a new name for Helium—let us call it *Evelium!* The trouble is that Helios was a male god, not a female, as was *Eve.* But perhaps Helium-Evelium is androgynous? In any case, there are four faces, like the *faces of Brahma*—or the angel of Ezekiel?

Cochran then explicates further the "strange new properties," and in doing so notes that in the supercooled state the "wave properties of matter" predominate to such an extent that the consciousness of matter is "more evident." Now this poses a fair question: does this not imply (or support) Winifred Babcock's thesis that *mental energy may act on helium to supercool it to the point where its properties*

manifest themselves as helium II, with the "strange new properties" that Cochran refers to? And when one recalls that helium II has the properties of a plasma and is capable of transmitting longitudinal and transverse waves simultaneously, we see that it provides the pattern for the "cross action" so crucial ("cruciform") to the philosophy of Cosmic Humanism, and thus might well constitute the medium for the Helium Psychosphere. Different though "hot" and "cold" helium are, there is nevertheless a fundamental unity behind the "superfluidity" and "superconductivity" of both, for both are macroscopic quantum phenomena, as was first suggested by Fritz London (cf. *Scientific American,* 213, 1965, October, p. 67).

Integration via Orthosynthesis

As of now, this new view provides us with the only gleam of light through a long dark tunnel. The physicists are eagerly studying the "orthogonality between different types of quanta" and how electron-phonon, and electron-plasmon interactions in metals, and other couplings, in liquid helium, are possible, (cf. "Concepts of Nuclear Structure," by Aaga Bohr, *Science,* 172, 1971, 17-21). This involves no challenge to the view previously mentioned that He^3 and He^4 are quantum fluids ("Fermi liquids") in which quantum effects are evident on a macroscopic scale—even in the intergalactic context, we would hope. The "quantum fluid" aspects are discussed by W. E. Keller in his book, *Helium-3 and Helium-4* (Plenum Press, 1969).

The entire field of what is known as quantum electronics—that is, electronics phenomena of a quantum-mechanical nature—is now opening up, and the fascinating thing is that maser amplification is involved in the process. In other words, the electronic amplifiers or oscillators are the bridge between electromagnetic waves and quantum-mechanical systems. How, on the practical side, the development of the "phonon maser," capable of producing very high frequency "sounds," will enable the Cosmic Humanists to achieve the synthesis of the Helium Psychosphere and the parallel proliferation of the "Cosmic Alphaphone"—this is something for the future.

The strange thing—to me—is that the existence of the galactic helium Psychosphere now seems more credible as a scientific hypothesis than the earlier notion of the planetary Helium Psychosphere—this having been posited as the other pole of our bipolar theory of the origin and nature of human consciousness. Of course, there is the very real possibility that both may exist as complementary realities—like God and Man—mutually sustaining each other by some electromagnetic and/or psi-field bond of union. So we still have things to think about.

One difficulty with the hypothesis of the circumglobal heliosphere is that the earth's heliosphere is not the helium II plasma—this, because as conventional physics would point out, the temperature and density parameters are not correct. Of course, orthodox physical chemistry will look askance at suggestions that

1) "mind energy" (whether by *Q force* or *psychons*) can act as an agent for maintaining the integrity of the carbon molecules in space, which, once they have been formed, should be broken down into atoms by the intense radiations pervading cosmic space; or

2) that mind energy can act as a force-field for transforming the circumglobal helium gas into a plasma for the Psychosphere. To admit such possibilities would be tantamount to converting astrophysics into what some would call "Christian Science" physics. This, they would insist, is too much like "supernaturalism" for serious consideration.

More along such naturalistic lines is the thinking advanced by the chemists who now seek for a "new kind of chemistry" for the interstellar clouds of organic molecules. As reported in *Science News* (99, 1971, p. 382), under the heading of "Chemistry Between the Stars," this new theory could be in terms of energy balance exchanges in space that keep the compounds stable and perhaps even have a role in the origin of life itself.

This reasoning, plausible though it be, may not be conclusive. In our own search for causal explanations we have always sought for naturalistic agencies, and we urge that a broader and deeper understanding will eventually have to provide a place for whatever paraphysical and parapsychological realities succeed in proving themselves causally efficacious. True, when we introduce *life* and *mind* as fields of influence (not as "reified entities") which have their residence in the upper dimensions of the hierarchy, but as interpenetrating fields can also perfuse the global DNA-RNA helix to incite the embryogenesis of the earth-organism—this is something quite exotic. Our biggest problem still looms ahead of us: how to get from the four faces (cores; isotopes) of helium to the four nucleotides of the DNA-RNA double helix of the gene to the planetary radiation belts of thought—the Helium Psychosphere. Where do we start?

Even though the total picture eludes us, we do know some of the fragments—precious stones for the composition of the grand mosaic—the ubiquitous role of atomic hydrogen in cosmogenesis; hydrogen's equally crucial role in its transmutation into helium and the later bonding function in organic synthesis; superconductivity as related to cosmoplasmic magnetism; phonon and Alfvén waves; the

role of electrons in the emergence of the helices of higher systems; the role of polarized light and ionization; the solar winds in interplanetary fields and in control of geomagnetism and the associated "drifting continents"—all these are presently the "surplus parts" of cosmology, available to those master visionaries who must launch their mental space vehicles into the solar system and the vaster galaxies. These are the patchwork pieces to be woven into the seamless garment that enfolds the 8-dimensional lens-and-mirror-image cosmos. These are the precious stones in the dome of many colored glass that stain the white radiance of eternity.

XI. THE SPIRAL OF SYNTHESIS

Any philosophy of science that hopes for some degree of confirmation must be subjected to criticism. The foregoing adventure in synthesis has indeed received the benefit of comments. Three of the more recent critiques have come from fellow integrators who are now in the service of NASA at Huntsville, Alabama (1971). Other criticisms will doubtless be forthcoming after this book is published. Meantime, permit me to share the just-mentioned suggestions as these have come to me from Mr. James Beal, Mr. H. Prescott Sleeper, and Mr. Ottmar Stehle.

In general Mr. Beal is enthusiastic about my hypothesis and the viewpoint developed. In a letter he informs me that he likes the idea in the "Resonance" article and intends to utilize the notion of the "pulsing feed-back between man and the galaxy to build the *psi*-field." This, he goes on to say, ties in with his article on "Pantheistic Awareness," soon to appear. What is especially helpful to me is his reference to the article by Dr. E. R. Graf on "A New Criterion in the Quest for Life in Our Solar System" (cf. *National Symposium*, American Astronomical Society, 1967), where Dr. Graf asserts that the planetary resonator hypothesis, based on fundamental electromagnetic phenomena, is a corollary of modern theories of planetary formation. According to Dr. Graf, *the origin of the magnetic field is in terms of the planet's axial rotation and involves the ionosphere and Van Allen belts.* (For my part, I would not want to ignore the earth's plasma core as part of the total picture of the earth-dynamo.) Our scientists inform us that over a decade ago it was noted that the earth-ionosphere cavity can act as a natural resonator. Mr. Sleeper also makes use of this mechanism in his thinking.

At the conclusion of his essay, Mr. Beal mentions that my reference to Platonic solids recalls Buckminster Fuller's work relative

to geodesic shapes, polyhedral energetic geometry, and universal advanced design science. Fuller, of course, has noted that the tetrahedron is one of the basic building blocks and has indicated how the double helix form of the DNA-RNA molecule fits into the geometry of universal design (see his *No More Secondhand God*). Getting back to Beal, I must record his prediction that what he terms "synergy of phase-locked-in-on-alpha beam" will in time create a real, functional World Sensorium. Such encouragement is always welcome!

Moving next to the comments of Mr. H. Prescott Sleeper, Jr., let us see how he follows through on his ideas as first stated in Appendix VI in my book, *Cosmic Humanism,* under the title: "The Pulsing Ionosphere. A Link Between Human Beings and the Universe." He still holds to the view there expressed, namely, that the planetary resonances are the vehicle of influence between human brain waves and the ionosphere. The specific bridge now is said to be solar cycle activity, ionosphere spherical cavity ionizations, fine tuning of the earth with ionosphere cavity resonant frequencies 18, 14, 21 cycles per second. Thus Mr. Sleeper accepts the three major brain wave cycles, *theta, alpha,* and *beta,* as mentioned previously.

According to Mr. Sleeper, the key factors are:

Ionosphere → solar activity → planetary resonance →
galactic hydrogen plasma → spin memory storage → Psychosphere.

Aside from a difference of opinion concerning the role of helium, Mr. Sleeper states that my answers to the "high level questions are great." Evidently the two of us are not far apart, and further discussions may resolve the thought dissonances.

My third collaborator at NASA (Summer, 1971) was Mr. Ottmar Stehle, a German National Science Foundation scientist at Huntsville. Mr. Stehle and I have had first hand conversations and we have corresponded concerning the present chapter. He has written some comments which help to advance the ideas here presented.

As Mr. Stehle puts it, there *seem* to be three or four sets of brain waves; but in actual fact there is a continuous spectrum of frequencies that lie between o→ ∝ Hz (Hertzian waves). We know that radiations are classified as X-rays, visual rays, heat and radio waves; and so on; but the waves themselves are all electro-magnetic waves in different regions of the spectrum. In the so-called "brain waves" region we are dealing with waves in the low frequency range. Also, Stehle points out, in the brain wave system there are harmonics which keep the whole ensemble in equilibrium.

As part of his overall reaction, Mr. Stehle notes that we cannot ignore the gravitational waves, which, he surmises, may be in the same general range as the brain waves. Indeed, he even conjectures that the *P-K* effect may perhaps be explained as a result of the

interaction of the human brain waves and the gravitational waves—perhaps there is some mutual interference of brain waves and gravitational waves; or a resonance between alpha waves and earth's electromagnetic field.

Mr. Stehle goes so far as to suggest that the pyramids of Egypt, because of earth-sun distances and alignments, are able to focus energy-fields and maintain a resonance. In a strange way this supposed intimate connection between earth and sun, and man and the solar system, may find some support in the speculations of Dr. Anatoli Podshibyakin of the Institute of Clinical Physiology in Kiev, who claims that by charting acupuncture points one can see the bio-plasma reacts *instantly* to solar flares on the surface of the sun. (In passing, one is tempted to inquire: to what extent does the Russian scientist's idea of "bio-plasmic energy" resemble Wilhelm Reich's "orgone energy"?) In any event, this supposed concomitance, if confirmed by others, presents a marvelous phenomenon, since the solar explosions elicit *instant* body reactions even while the cosmic particles take a much longer time to reach the earth. What, then, has happened to the "velocity of light"? "Superlight velocity," some would say. But could it be that the human organism and the sun can have virtual contact via the higher dimensional focusing agent we have designated as the *Life Lens?*

Before proceeding further, let us now summarize Mr. Stehle's reactions to my own hypothesis. Mr. Stehle is willing and happy to accept my proposition that there is a relation between the galactic plasmic field, the ionosphere (he does not mention the heliosphere by name), and the so-called alpha, beta, theta, and delta brain waves in the human body.

So far we are agreed. But Mr. Stehle does not stop with his responses to my own speculations. He is an original thinker in his own right. His own further advances inform us that he thinks of "symbols" as antenna (mental antenna?), and he conjectures that they can represent polarized fields exhibiting similarities of energy patterns (homomorphisms?) on various levels—physical, biological, and mental.

At this time we might point out that immediately there is a puzzling problem that arises in connection with the supposition concerning symbols as field patterns from space which reach into and are absorbed by the organism's antenna. The problem results from the fact that there is no known or proposed explanation of how these wave patterns that presumably must come into the organism via the human "unconscious" can then rise above the threshold into consciousness and serve as emergent forms. If, somehow, one level of brain waves could escalate into the next level and convert one kind

of consciousness into the next, this might help explain the transmutation. For my part, I might want to invoke my own earlier speculation about galactic influences as we adapted this from Dr. Puharich's suggestion that cosmic influences enter the organism by way of the signal detection system on the nuclear level of hydrogen atoms—the bonding units of organic compounds—as already discussed. We therefore inquire: could this not also be the mechanism for the reception of the pattern influences posited by Stehle's "antenna"? The verification of this supposition will require much investigation, and I am not finished with that work. Meantime, the best guess concerning the mechanism in the central nervous system rests upon the possibility that the alpha, beta, and theta brain waves are frequencies representing states of consciousness and that some sort of step-up process of synchronization may mediate the gap between the unconscious reservoir of symbol forms and the supervenient conscious experiences.

This, however, is only part of Mr. Stehle's voyage into the unknown. Continuing his journey, he supposes next that these polarizationed configurations of symbols can be put into frames of reference that have directional characteristics (Stehle has a pendulum-type *aurameter* to do this!), and if we examine the three basic polarizations, we have *horizontal, vertical,* and *circular.* In this exploratory voyage of discovery Mr. Stehle suggests that the directional arrows are: *north*—horizontal sweeping; *east*—vertical sweeping; *west*—circular clockwise; *south*—circular counterclockwise. The concatenations here are tantalizing; but I cannot explicate this—the reader will have to await Mr. Stehle's own exposition in what will turn out to be an important paper. Meantime, and to add a bit to the developing plot, our metaphysical adventurer next proposes to relate these polarized scannings 1) to brain scannings, and 2) on the complementary cultural side, to such social archetypes as are, for example, exhibited in religion (such as the *Trinity*), and in ideological archetypes. This, of course, is a tremendous leap into the dark, especially when one considers the problems of topological transformations of "images" that would arise in transposings from cosmic → biological → mental → social fields. The difficulties here are discussed in my book, *The Integration of Human Knowledge* (page 133).

At this point we have come to the edge of our scientist's expanding horizon. Let us hope that Mr. Stehle will be able to continue his important studies and open up new avenues to the growing cosmological synthesis. Some kind of unified picture is taking shape and further development of the flickering and fitful "images" will in time take coherent form. Certainly it augurs well

that some *Eureka*-type adventurers are able to synchronize their alpha and theta rhythms into some sort of intercommunicative consciousness.

EUREKA . . .?

What else, one wonders, will be revealed in the total vision? If I may be allowed "one more go at it," I would return to the overarching problem of finding the connecting links between the DNA-RNA double helix and the yang-yin spiral of the earth's "radiation belts of thought" (see Diagrams II and III). One wonders: should we try to utilize Stehle's proposal concerning the coupling of brain waves from the cerebral cortex and the earth's gravitational (or/and) electromagnetic field—thus joining the microcosmic and macrocosmic universes? In that case, I would also want to consider the possible role of neutrinos as they course through cosmic space toward planet earth's center—a plasma of neutrino energy at the globe's liquid (or semi-liquid) core of iron. The components of a prodigious and awesome synthesis are staring us in the face. We see the elements as parts, but not fitted into the completed whole. Let us remind ourselves of these scattered fragments: the study of the double helix of the DNA-RNA protein macromolecules reveals that the bases of the four nucleotides are stacked in planes somewhat perpendicular to the long axes of the helices. These planes are like rungs on the helix ladder. The two chains of the ladder are held together by the hydrogen bonds between the bases. Mutations supposedly are due to shifts in the units of the hydrogen bonds.

Given this molecular biological foundation as the structural basis for the living organism, it is then possible to regard the processes of learning and remembering as functions of the synthesis of specific RNA molecules, and if this information is coded on the level of the molecular constituents of the genes, *or further down in the crystal lattices of the atomic level,* then, in the latter case, the crystal lattice components of the molecule of nucleic acid provide a kind of fixed film of sight and sound tracks that can be reproduced in the holographic images of human consciousness as we remember and create the inner life of man. These accompanying brain waves could provide the source materials for the higher synthesis of the emerging World Sensorium. Recalling next that the four nucleotides have an alphabet of three components, in which case the fundamental structure is 4 x 3 = 12, we realize that we have here the symbolic elements of astrology with its twelve "signs" and the 12 notes of the chromatic musical scale. Is this our old friend, the "doctrine of the duodecimals"? And are we back, once more, to the "plasma music" of the "galactic auraphone"?

If such be the case, then in that celestial music of the spheres we can hear a symphony in which C. H. Waddington's "epigenetic space" as the position between genotype and phenotype space is energized and transformed by the "emergent force field" of Robert A. Smith to create a synergy in which Buckminster Fuller's *World Game* becomes a technology for the development of the awareness we now commonly term cosmic consciousness. For these reasons, and in this fashion, we might well echo the cry of Kepler in the language of the laser beam: *Oh Lord and Cosmic Lens, I visualize Thy images after Thee!*

AMEN . . .?

NOTES AND REFERENCES

1. The material for this section is based on various expositions of "Plasma Physics," especially "Plasma Physics," by Sanford C. Brown, *American Scientist,* **50**, 1962, 59-74; and "Plasma Physics," by R. M. Kulsrud, *American Scientist,* **48**, 1960, 581 ff.
2. Cf. "Plasma Physics and Metallurgy," by M. F. Hoyaux, *American Scientist,* **54**, 1966, 211-220.
3. Cf. "A Quantum Relation in Large Scale Electric Wave Phenomena," by T. L. Eckersley, *Nature,* **119**, 1927, p. 234.
4. Cf. "The Origin of Cosmic Rays," by Geoffrey Burbidge, *Scientific American,* **215**, 1966 (August), pp. 32 ff.
5. These technical matters are dealt with in the following articles: "Spectroscopy, Molecular Orbitals, and Chemical Bonding," by Robert S. Mullikan, *Science,* **157**, 1967, 13-24; and "The Three Spectroscopies," by Victor F. Weisskopf, *Scientific American,* **218**, 1968 (May), 15-29.
6. These matters are discussed in an article on "Cosmology and Quantum Electrodynamics," by Fred Hoyle and J. V. Narliskar, *Nature,* 219, 1968, 340-341.
7. Cf. "Cryogenics: New Superconducting Materials Announced at Dallas," *Science,* **168**, 1970, p. 103.
8. Cf. "The Structure of Viruses," by R. W. Horne, *Scientific American,* 208, 1963 (Jan.), 48-56.
9. Cf. "Parity-Violating Nuclear Forces," *Science,* **168**, 1970, 104-105.
10. Cf. "Sector Structure of the Quiet Interplanetary Magnetic Field," by N. F. Ness and J. M. Wilcox, *Science,* **148**, 1965, 1592-1594.

APPENDIX

Cosmic Archetypes as Platonic Holograms

IT IS EVIDENT in the preceding chapters that Mrs. Esther Watson Tipple—following the "psychodynamics" of Major DeLoach—sees a connection between the Twelve Tone Scale and the Twelve Sons of Jacob. She groups the tones and the sons at the four gates of the "Ezekiel Pattern" of Solomon's Temple (at the North, East, South, and West Walls), and thus we have the three brothers at each of the four gates. These brothers symbolize and personify the Twelve Tones of the Pythagorean cycle and give the configurations of the "triangle triads" of the tonal configurations with their vibration-frequency ratios. As illustrated in the "Ezekiel Pattern" (in Diagram XI), the reader will observe that Benjamin is in the yellow region, and this, Mrs. Tipple states, is because the sector of Joseph-Benjamin-Dan constitutes the 3 to 4 to 5 harmonic series that has E as the fundamental or first harmonic.

It was Major DeLoach's theory that the sequence of colors of the spectrum could be paired off with the sequence of notes of the musical scale. One wonders how this arrangement of tones-colors-brothers-zodiacal signs was arrived at. As noted in previous chapters, the color scale was based on the order of the colors of the precious stones on the High Priest's breastplate (as this is given in *Exodus* and *Ezekiel*), and these, in turn, symbolized the Twelve Tribes of Israel. Thus the arrangement of the tones-tribes-brothers-walls-gates seems to have no other source than the Old Testament pronouncements. But again one wonders: can there be any other justification, or must we take this all "on faith"? Could it be, for example, that the triangle triads of notes are both "chordiness" in music and "harmony" in personality traits in the tribes and/or brothers? Since

Major DeLoach is no longer available for questioning, this is an unsolved problem.

Perhaps some readers will impatiently exclaim: is this important anyway? The reply must be that it isn't, unless there is some deeper and much wider cosmological significance to this symbolism. This could be the case if the Twelve Tribes of Israel were in fact terrestrial personifications of cosmic realities—the Twelve Signs of the Zodiac, for example, as this topic has been discussed in previous sections of this book. I shall return to such possibilities in a moment.

This inclination to find prophetic indications in Biblical records is strong in a certain type of temperament. Sober historians, of course, are wary of "revelations" concerning coming events. Nevertheless, it is interesting to observe the ingenuity displayed in this field. This is especially the case with Madame Blavatsky. As we have already seen, in her mammoth work, *The Secret Doctrine,* the founder of Theosophy in the West comments on the relation of the "Twelve Jewish Patriarchs" and the "Signs of the Zodiac" (1928, Vol. II, p. 714). Here she pairs off the "sons" and the "signs" in the following manner:

1)	Aquarius		—	Reuben
2)	Gemini		—	Simon and Levi
3)	Leo		—	Judah
4)	Pisces		—	Zabulon (Zebulun)
5)	Taurus		—	Issachar
6)	Scorpio		—	Dan
7)	Capricorn		—	Naphtali
8)	Cancer		—	Benjamin
9)	Libra		—	Asher
10)	Sagittarius		—	Joseph
11)	Virgo		—	Dinah (daughter of Jacob)
12)		(?)	—	(?)

Madame Blavatsky is a bit careless about her listings of what she terms the "alleged correspondences." This is surprising, when one recalls that she treats this seriously on other occasions. At this point (p. 714) Madame Blavatsky rescribes the "correspondences" as a product of a conspiracy on the part of "Roman Catholic writers." Thus she concludes her discussion of this "absurd notion that the creators of Heaven and Earth have placed in Heaven (the Zodiac of the galaxy) the types of twelve vicious Jews" (p. 730). This "anti-Semitism" comes as a shock to the reader; but one soon discovers other evidences of both anti-Christian and anti-Jewish propaganda in this supposedly masterly work.

A rather different version of the Sons of Jacob saga is presented in the Reverend Joseph H. Allen's book, *Judah's Scepter and Joseph's*

Birthright. Here this author considers the possibility that specific nations of today are the direct descendants of the Lost Tribes of Israel. According to the Reverend Allen, these "Abrahamic Nations" of the "European races" represent the Tribes of Israel *which have dominated successive periods of history.* I shall not reproduce the Rev. Allen's pairings of the nations and the sons, except to note that Manasseh represents America, Ephraim the British, and Benjamin represents the "League of Nations." The final moral of the genealogy of the "sons" and "nations" is that "there will always be an Israel," and that "no weapon that is forged against these (Israel) shall prosper." One wonders whether this is a comforting thought as the contemporary Israeli face the weapons and technicians and soldiers of modern Egypt, aided and abetted by the Soviet Union!

It is not necessary for us to take a stand on this matter of the "deeper meaning of Biblical texts." In general, it seems that a Cosmic Humanism should refrain from trying to read history and prophecy through the eyes of any one of the world's great scriptures. But if a tight historical causality compels us to find the future already inscribed on the scroll of time, this future, for us, will be found to be written in the morphology of the galaxy and the Psychosphere. And that brings us back to the cosmological basis for the Ezekiel Pattern.

Our own speculations must seem pretty extravagant to the flat-footed pedestrians. But "extravagance" in these days of "breakthroughs" is a matter of degree. Consider, for example, the speculations of Rudolf Steiner.

This well-known founder of Anthroposophy calmly informs us in his book, *Occult History* (London, 1957), that the twelve cranial nerves of the human organism are

> nothing else than material densifications of what arose in the human being through instreaming of the twelve macroscopic powers. The ancient Persian pictured the twelve Archangel-Beings working from the twelve directions of the Zodiac, working into the human head in twelve rays, in order gradually to produce what is now our intelligence.

Of course, the homomorphism here is based on the ancient doctrine that the human microcosm is an image of the macrocosm. This is an application of the Hermetic doctrine, "as above, so below." Thus human evolution is coerced by cosmic forces.

This doctrine of twelve etheric streams of cosmic radiation brings in astrological ideas—the "signs" of the Zodiac—in a form that goes beyond anything that contemporary science can accept. I do not know through what kinds of studies of Zoroastrian Mazdaism Dr. Rudolf Steiner acquired his "knowledge" of the ancient Persian (Indo-Iranian) religion; nor is it revealed where and how Steiner gained his insight into the evolution of the microscopic

(physiological) counterparts of the twelve cosmic "forces from the Hierarchies." This claim to a primordial wisdom, as we know, is a part of "orthodox" Theosophy, and you may take it or leave it as you see fit. For my part, I suspend judgment.

One of the interesting side-lights of this type of approach is the manner in which such macrocosm-microcosm analogies reappear in Giordano Bruno. This at any rate is the thesis of Frances A. Yates. In her scholarly work, *Giordano Bruno and the Hermetic Tradition* (London, 1964), Miss Yates argues cogently that Bruno was really an occultist and magician who defended the heliocentric cosmology of Copernicus as a subsidiary part of a magical, astrological, Hermetic philosophy. Small wonder that the monk who believed that Christianity is a corrupt version of a superior and original Egyptian religion should, by the Inquisition, have been judged guilty of heresy and been burned at the stake!

One thing that is especially interesting in Bruno's world-view is the seemingly peculiar theory of a magical link *(vincula)* between the greater (outer) cosmos, the macrocosm, and the inner soul, the microcosm. This is the doctrine of *cosmic imagination* wherein the occult sympathy and linkage of the stellar bodies and the objects and features on the earth make it possible to manipulate the mental images (symbols) that connect heavenly bodies and earth-aspects. This causal "magic" is possible because the astrological images are impressed on memory and reflect the demonic influences. (These demonic influences are not "devils," as in Christian theory.) Thus the solar theology of the priests of Re at Heliopolis, who flourished during the time of ancient Egypt (ca. 2750 B.C.) is reborn in this Renaissance "reincarnation" of Hermes Trismegistos!

This astonishing reverberation of Hermeticism is once more repeated when Rudolf Steiner appears on the scene. Steiner's interpretation of Zoroastrianism is very similar to Blavatsky's version of the twelve sons of Jacob as personifications of the twelve signs of the Zodiac. And that brings us back to our earlier problem—whether the macrocosm-microcosm homomorphism helps us to understand the "psychodynamics" of Major DeLoach and Mrs. Tipple, so that the "Ezekiel Pattern" is indeed something more than a fortuitous analogy. If so, then the real challenge in all this plethora of speculation is the definite scientific problem of the *modus operandi* of the cosmic force-field influences. The prospects are not very hopeful. But before we despair of the possibility of any rational justification, let us remind ourselves of certain rather well established empirical findings.

We know, for example, that there is evidence of an interaction between the earth's magnetic field, the ionosphere, and the alpha

rhythm of the eye-brain sector of the human organism. We know also of Dr. Dietrich E. Beischer's plan for the next step—to measure the magnetoencephalogram ("in a well-shielded environment") and demonstrate a transference of brain functions and field influences over some distance (as discussed in my article, "Building the World Sensorium," *Systematics,* 4, 1966, pp. 1-17). And farther out in space, we know of the planetary "voices," where it is clear that, e.g., the planet Jupiter broadcasts its radio waves by acting as a giant energy exchanger driven by the sun and operating on the principle of the maser.

As indicated in my *Systematics* article, this latter conception employs the notion of spin axes of electrons which, in higher energy states, are aligned with the Jovian magnetic field, and which "flip over" when they are triggered by a surge of particles from the sun. These perturbations in the magnetic field frequencies in turn cause cascades of emission from Jupiter's surface.

What is noteworthy here is the reference to the "flipping over" of the spin axes on the Jovian surface. Dr. Beischer appeals to the notion of "nuclear spin" of the electrons which "flip over"—but it is not clear to me that this is the same physical phenomenon that is invoked in the case of the "voices" emanating from Jupiter. Most interesting of all, we *do* know that here on the earth the phenomenon of electron spin has quite a significant biological role, and that this effect is being studied in research on spin resonances *(ESR).*

And now that we are momentarily stranded on Jupiter—a most remarkable planet—let us pause to notice the presence there of the great "Red Spot," which is readily observed through telescopes. The planet Jupiter has been described as "The Radio-Active Planet" (cf. Alex G. Smith's article in *American Scientist,* 57, 1969, 177-192). Several theories of the cause of the "voices" have been advanced, one by a Soviet scientist who believes that radio emission signals arise from the oscillations of the ionosphere (which is very much like the earth's Van Allen belt) in Jupiter's atmosphere. More specifically, with respect to the "Red Spot," its nature and effects, the suggestion has recently been put forth that this manifestation is related to the *hydrogen-helium system,* i.e., that the "spot" is a result of molecular hydrogen floating on a helium-rich liquid hydrogen mantle. These matters are discussed by Dr. R. Smoluchowsky in his article, "Jupiter's Convection and Its Red Spot," *Science,* 168, 1970, 1340-1342.

As if this were not enough to set the cortical acids into secretion, we learn from the article by Stanley L. Miller and Harold C. Urey ("Organic Compound Synthesis on the Primitive Earth," *Science,*

130, 1959, 245-251), that the synthesis of formaldehyde from carbon dioxide and water can be produced by the use of helium ions from a cyclotron. This reminds us of the recent discovery of formaldehyde ("embalming fluid") in the depths of cosmic space—something discussed in previous chapters. One therefore wonders: is it possible that the helium that helps to generate consciousness in earth humans (if our Helium Psychosphere concept is on the right track) is also the helium element that helps to generate one of the precursors of life in outer space?

How that "helium spot on Jupiter" fits into all this is not clear. But it *is* clear that the "solar wind," which influences the great Red Spot as a possibly hydrogen-helium phenomenon, obviously influences the earth's magnetosphere and ionosphere, and these in turn do indeed have biological effects here on the earth. Thus, strangely and portentously, the quantum mechanical ideas of Mr. A. A. Cochran join hands with the conjectures of Andrija Puharich in moving toward a "cosmecology" synthesis that is utterly fascinating in the possibilities that open up. Why then, it may be asked, should one boggle at astrology as a science of the influence of the stars and the planets on human destiny?

As already pointed out, one difficulty with astrology as a doctrine of the influence of the "heavenly pattern on earth" is the widely accepted notion that the "twelve signs of the zodiac" have some special importance in the galaxy's causal nexus. This assigns a negligible role to the remaining 69 configurations (81 - 12 = 69). Aside from that, the skeptic notes, the very idea of "signs" is preposterous—an externalization of subjective imagery into cosmic "patterns."

None the less, the question persists: is there, behind both forms of "images"—subjective and objective, microcosmic and macrocosmic—a Platonic archetype that serves as a morphogenetic field of force in man and the cosmos? Whatever the answer, it is clear that the galactic phenomenology set forth in our own "cosmecology" is free from the restrictive "twelve signs of the Zodiac" obsession, if that is what it is.

The one investigator who provided me with the most and the best assistance in trying to think through this overwhelming problem is Dr. Andrija Puharich. I have already quoted several items from our exchange of communications. Let us have one last fling at this astral phenomenology, bringing up to date the vast extrapolations we have generated. Some repetition and some fresh material will be integrated.

As already noted, in his suggestions to me Dr. Puharich calls attention to the fact that most of the matter of the galaxy is made of

hydrogen. This hydrogen is fairly evenly distributed throughout our galactic disc, so that in reality we humans live in a cosmic hydrogen field. Given this, along with the quantized spin orientations of the protons of this field and their polarized states in geometrical configurations, and we have the equivalent of the *Lens* of the *Cosmic Imagination,* which can use this system to influence events in our solar system.

If we grant the general thesis 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 the foundational biophysical layer is provided by spin, precession, and the like, of atomic constituents with respect to orientations, magnetic moments, polarizations, and so on.

Since biological systems incorporate only levo-rotary amino acids in their proteins (including *DNA* and *RNA*), this biological "bias" must reflect a field influence of a higher order. Here we find a higher harmony in the symphony of life. This may bring in a multi-dimensional influence.

In biophysical systems—including the human brain—spin, precession, and angular momentum exhibit coherence with respect to dialectic orientation, phase, and polarization. The analogue of the brain at work—as in visualizations—would be a laser hologram. Accordingly there is 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 are a function of the complexity of interference patterns. There is also a complementarity between the corpuscular (quantum) aspects and the wave (spiraloid) aspects of organic evolution. If, on the human level, we can get the right minds to focus in harmony on the problem and come up with the correct "interference pattern," we may yet create a lovely Platonic Hologram. In that day we may also write the score and the equations for the symphony of wave actions that course through man from spin precessions of the lowest level electrons within him to the waves that originate in the galactic and supergalactic systems which, sooner or later (or both), act in and through mankind. The Platonic Hologram will be the collective picture (phanoscope) of man-cosmos synchronicities.

Dr. Puharich's hypotheses do not deal with the basic problem of the role of neutrinos and photons and superlight velocities in cosmology. He makes no attempt to answer the question of what sets the psi-plasma into vortical motion to create particles that emerge as hydrogen and transmute into helium. His world-view does not deal

with the World Sensorium and the Helium Psychosphere. In my own view, it still seems that the helium that surrounds the earth may be required to build up the field potential for the bipolar relationship we have postulated for the emergence of human consciousness. But we must thank Dr. Puharich for his extraordinarily stimulating ideas—even more so, if, ultimately, we can relate these ideas to the Q force of Preston Harold as set forth in the volume, *The Single Reality*. This is a consummation devoutly to be sought.

Meantime, in this Appendix, we seem to have brought to light another problem. Perhaps the reader has also sensed the difficulty. By relating the psychodynamics of human consciousness to the galaxy's hydrogen-helium plasma, it may appear that we have rendered superfluous the role of the earth's heliosphere as the vehicle of the feed-back circuitry between the human brain, as one pole, and the outer pulsing resonator as the other pole.

I do not know whether one could make out a case for the idea that *both* are required for the generation of human consciousness, i.e., that we have a galactic-planetary coupling. How could these complement each other? A possible compromise would be to regard the galactic hydrogen-helium plasma as the medium for the galaxy's "mind," while the earth's heliosphere is the planetary vehicle for the brain's bipolarity. Perhaps the Galactic Sensorium may provide the appropriate vehicle for Preston Harold's *Q force;* whereas the earth's heliosphere and the earth's central core plasma, provide the "home" for the converging neutrinos, in accordance with the "Single Reality" synthesis. Of course, the "solar wind" also gets in its "licks" as part of the existential phenomenology.

Obviously, in these various circumversions, we must also see to it that in the eight-dimensional cosmos all interlocking "forces" are located in their proper dimensions. It may be that the *Galactic Sensorium (Lensor)* is in a higher dimension—perhaps the seventh—while the *World Sensorium* of planet earth is a circumglobal vehicle residing in its sixth dimensional habitat. Quite possibly the physicists, in the course of time, will verify the existence, and preempt the use, of the hypothecated "fifth force," and so it may not be available for the postulated *psi*-field medium. But how, in our cosmic humanism, the "higher" interacts causally with the "lower," and how, specifically, the "resonant power of the eye-brain-hand synthesis" (or "cortico-thalamic integration") can be utilized for anti-entropic syntropy—these are problems we have wrestled with throughout this entire book. I hope to return to this nest of tantalizing mysteries in my next volume, *Magnetic Moments In Human History,* still in its formative stages.

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