II

PROSPECTUS

In the past few decades a profound human drama has been 43
enacted which has encompassed all of the sciences and has reached into almost every sphere of human activity. The order of the day has been intellectual crises whose resolutions are now being approached with the sense that we stand on a new cognitive threshold in human history. The quest of science is the seeking of the most fundamental and general explanatory law or principle to understand ourselves and our world. Why this urgent quest? There is the fact that once this principle or law is known we can understand how and why things happen as they do, allowing some flexibility due to chance factors. Aside from this, however, social scientists have long known that collective group action and a feeling of kindredship arise from the sharing of common concepts and understanding. Moreover, scientists have long known that empirical grounds for such kindredship exist (humanity is in fact one family) but they have been unable to convey this information because of a lack of unifying concepts to tie their fields together and because of the many reified-dualistic concepts and cognitive systems of religion, philosophy, history—and the reified concepts of science itself which militate against this common understanding. Thus, another salient reason behind the above quest of science is to provide the concepts and understanding which promote this realization—the feeling of social and cultural kindredship and solidarity in a particular nation and in the diverse peoples of the human family as a whole. Unitary theory, a product of the research of pure science over the past four hundred years, aims to provide these unifying concepts.

The aim of unitary theory, and of pure and applied science, is to provide a broad highway upon which all the diverse peoples of the human family can travel to wealth, well-being, freedom and high human values. The aim of unitary theory and science is the establishment of a world community of nations, in fact and not in fiction, based on real, political, social and economic democracy which holds human values, the dignity of the individual personality, the stability of the human family, and the independence and identity of all individual nations as paramount goals. The aim of unitary 44
theory and science is the establishment of a world community of nations in which no nation can dominate another and in which all men, women, and children of the human family can live, love, work and play together and enjoy one another in modern communities in a modern world. Socially and culturally, it might be said that the aim and goal of unitary theory and science is an open society whose choices and decisions are rational and deliberate; whose motives are

based on human love, kindness, understanding, cooperation and mutual development; and into which society any individual may enter and have the opportunity to go up or down its social, economic, political and cultural hierarchies.

In brief, unitary theory (the latest development of which has come from an English theorist, Lancelot Law Whyte), the immediate product of quantum field theory, postulates the existence of a universal creative-formative process which operates on a single principle operating throughout nature with definite and determinable parameters. It is a formative process which is responsible for the great star cities of our Universe; which was the basis for the origin of life on this planet; which drives the process of evolution and which is hence at the core of biological structure, process and organization; which expresses itself in the development, operation and organization of the human psychological processes and which is, hence, responsible for the characteristics of human behavior, human society and human culture in all their aspects (allowing, of course, for chance factors). Applied to our age, the "unitary principle", as Whyte calls it, indicates we live in an exceedingly brilliant but severely maladjusted age. This pertains particularly to social, political, economic and cultural systems based on religious and philosophical systems and concepts which unitary theory and science must and shall challenge. Science and unitary theory aim to furnish national and world social, political, economic and cultural leadership; these other disciplines have failed. They can not furnish leadership in the modern world; in fact, they are potent factors of disorder. Science and unitary theory acting in cooperation with the liberal and fine arts and with the peoples of their respective communities and nations and with the peoples of the world community as a whole, aim to achieve and attain the modern world based on law and order. The highest of human values lie just ahead and can be attained with the courage to slough off the archaic past and maladjusted present and with the aim to create the future purposively and deliberately. Science and unitary theory, however, are creative and constructive. They aim to preserve religion and philosophy as part of the rich and colorful tradition of humanity (abstracting what is true, of value, of beauty, and of interest in these disciplines for the modern world). Science and unitary theory, however, do not aim to surrender an iota to the current irrationality and unveridicality of religious and philosophical doctrines.

45

The unitary theorist makes no pretension of detailed knowledge in any field but his knowledge has a wide scope. The generalizations of unitary theory are derived basically from the facts and theory provided by the eight branches of science and are enriched by the

concepts and values provided by the liberal and fine arts, and from philosophy and religion. This wide scope of knowledge is a source of strength to the unitary theorist for it permits maximum generality but it is also a source of weakness for the resulting theory is schematic and apt to be erroneous when applied to details. Consequently, assuming that the unitary principle is a valid universal law of nature, it is the responsibility of the specialists in the eight branches of science, in the liberal arts, in philosophy and in religion to correct the unveridical concepts, refine and constructively expand unitary theory by more and better knowledge and theory.

Unitary theory aims to form the basis of world culture and civilization—to provide a common basis for human understanding and cooperation among all the diverse peoples of the world. Unitary theory aims to create a better, happier, healthier, and more stable world community for all men, women, and children of the human family. The basic aim of this particular work is to apply unitary theory to the understanding of the origin of life and the origin of the universe, and to provide a unitary basis for modern psychology. Since unitary theory also aims ultimately to supplant all religious and philosophical systems, the topics to be covered below will have a wide range. Many important topics and subjects will be simply footnoted to serve primarily as future references. Human values will be of constant concern throughout the following development while current personalities, and current social, economic, political and cultural systems will often be of prime interest. Since unitary theory as it is now being developed is apt to be somewhat culture-bound, it is the responsibility of other unitary theorists working in other cultures to correct the provincialism of this and other works.

III

INTRODUCTION TO FIELD THEORY

46

THE RISE AND FALL OF EXPLANATORY HYPOTHESES LEADING TO NEWTON'S SYSTEM OF MECHANISTIC-MATERIALISM IN MODERN SCIENCE

> On the other hand, from the very beginning there has always been present the attempt to find a unifying theoretical basis for all these single sciences, consisting of a minimum of concepts and fundamental relationships, from which all the concepts and relationships of the single disciplines might be derived my logical process.This is what we mean by the search for a foundation of the whole of physics. The confident belief that this ultimate goal may be reached is the chief source of the passionate devotion which has always animated the researcher.
>
> Albert Einstein
> in *Readings in the Philosophy of Science*
> by Feigl and Brodbeck

Whoever looks up into the starry heavens is prompted to speculate about the beginnings and endings of things. One wonders about the origin of the universe, the earth, life, mind, and of man himself and his societies. Questions such as these have been raised by reflective men of every culture, in all times of the past and present.[1] Explanatory hypotheses to account for the beginnings of things first took the form of myth. For example the early Teutonic people, in attempting to explain the origin of the daily rhythm of our days and nights, believed that as the sun set over the lake, it was swallowed by the lake dragon. A battle ensued which gave us our night. But in the morning, the battle won, out would jump our little red sun to give us our day.

This early explanatory hypothesis as to the origin of our day and night cycle has come down to us in two forms. One appears in the underlying assumption of a modern cosmological theory which holds

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[[1] This description of the speculative curiosity of man is not used simply as a figure of speech. Dorothea Vernon, for example, after a lifetime of research in the field of perception, summarizes the main characteristic of man's perceptual process "as an effort to perceive the environment clearly." F. Bartlett similarly summarizes his long research on man's cognitive processes by stating that man's cognitive processes are characterized "by a search for cognitive meaning" for what lies behind and beyond the surface of his perceptual experiences. Thus, this intrinsic need to achieve perceptual clarity as to the surface of things and to understand what lies behind the surface phenomena plus the need to offset the fear and heartache due to the knowledge of the necessity of death for oneself and for one's loved ones, were common to the motivation of all men in all ages.]

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that the universe originated in the form of a cataclysmic explosion and the other appears in the form of the nursery school tale of Little Red Riding Hood and the Big Bad Wolf. Whatever the legacy left for us, this explanatory hypothesis provides a good example of how our remote ancestor utilized mythological explanations in an attempt to understand the origin of phenomena of their experience.

Physical anthropologists (paleethologists) interpret the artifacts placed in very ancient graves as meaning that this mythological type of explanation began about 180,000 to 200,000 years ago and dominated what we might call the cultural era of superstition. The cultural dominance of this tradition ended with the beginning of the era of religion but still dominates a sizable minority of humanity to this day.

Next arose another fundamental type of explanatory hypothesis which began the cultural era of religion. This is the explanatory hypothesis which utilizes the creative powers of a craftsman deity to explain the beginning of things. The origin of the deity concept itself can be traced, if not wholly, at least in part to the subterranean caverns and caves in Spain and France (such as the recently reopened cave-sanctuary of Lascaux near the town of Montignac in France) wherein some of our ancestors practiced their ritual art some 20 to 25 thousand years ago.[2] The artist-priest who could paint the pictures whereby, via the concept of sympathetic magic, the hunt and the gathering of food were to be assured of success, became the most revered and feared man in the primitive social group. However, in time geological conditions brought about changes; game and food grew scarce and the geographical regions where the caves existed had to be abandoned. But the memory of the artist-priest lived on in the social-cultural traditions of the wandering group. Over the generations, the artist-priest's function (to insure the success of the hunt and harvest) was slowly forgotten and other powers and characteristics were gradually attributed to them or symbols

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[[2] The usual explanation of the deity concept is to attribute its origin as an evolution from prior existing beliefs in nature gods. But this hypothesis does not explain why most peoples of the Near East and Mediterranean areas developed human-like deity gods while peoples of the Far-East (the Chinese) developed a process-like creator concept. (The writer is suggesting that the human-like deity concept originated in Europe—perhaps in Spain and France—but later, due to migration brought about by geological change, the deity concept became centered in the Mediterranean and Near East areas. And much later—about 2000 B.C.—the deity concept spread as far as India.) India, for example, which lies between the Mediterranean areas and China entertains both types of concepts to this day. This problem should be the subject of research.]

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symbols of them. In this way the idea of a deity with human-like attributes gradually arose. 48

Thus, from these early beginnings, an anthropomorphic concept of deity arose which was gradually elaborated through a process the theologian calls "progressive revelation" but which the modern social scientists calls "reification" meaning the attributing of "thing-like" properties to a symbolic concept when those properties belong in the objects which the symbolic concept is supposed to represent. As a consequence of this great proliferation of its imagined powers, the deity concept became—some 15,000 years after its early origin in the caves of Spain and France, 7,000 to 8,000 years ago—the Egyptian deity called Re, Ra, or Aton, the supreme Sun-god. This first "monotheistic" deity of the Egyptians was soon displaced by the polytheism of the Egyptian priesthood. But the concept did not disappear from Egyptian thought and it, in fact, became the prototype of all "monotheistic" craftsman deities of other peoples and cultures. (Later, in tomb-building Egypt, the deity concept began to take on the attributes of an architect, creator, and craftsman with the result that a concept of a deity with craftsman-creator attributes slowly emerged.) This was particularly true for the peoples of the Mediterranean area and still-to-be-civilized European barbarians whose civilizing fell to the lot of the Near Eastern and Mediterranean peoples.

In time, in the thinking and cultures of the Near Eastern and Mediterranean peoples, the concept of a monotheistic creator-deity acquired such powerful attributes that the origins of the universe, earth, life, mind, and mankind were explained as the special creations of his craftsmanship. So powerful was the authority of this master-craftsman that he could not only create all the universe but could also command all of his creations to live in immutable harmony for ever after. Man, however, was invested with the attribute of "free will" and chose to do evil which accounted for the great disorder man observed and experienced in his daily life. This explanatory hypothesis declined in both Greece and Rome but came to the fore again when both these cultures began to disappear from history. After its re-introduction into Western thought, this explanatory hypothesis once again began to decline during the Renaissance but "before the astonished eyes of Renaissance Europe there appeared a New World living in Horace's golden age." In a short space of time, the "chosen race" concept of the ancient Hebrews was revived by Calvin and the Mother Church, the latter in the form of a holy mission to Christianize the heathen Indian. The empirical result of this massive spiritual revival was the conquest of the Indian and the regression of the new continent to religious fundamentalism. The New World thus became the stronghold of the craftsman-deity hypothesis. And so it remains to this day. [49]

Beginning about 1000 B.C., two new types of fundamental explanatory hypotheses arose which began the cultural era of

philosophy. The philosophers of China, Greece, and India attempted to displace mythological and anthropomorphic explanatory hypotheses as to the origin and nature of things by deriving their own explanatory hypotheses from the powers and processes of rational thought or by utilizing inferences abstracted from observations of nature and especially from the observations of the structure and functioning of living things. The first type of explanatory hypothesis, cast in modern terms, is called mechanistic-materialism. The second type of fundamental hypothesis lacks a formal name; we shall call it the field-process hypothesis.

By 450 B.C. both of these types of explanatory hypotheses were already elaborated into philosophical systems. The first type was destined to dominate the rational thought of Western civilization until the twentieth century. In fact, the mechanistic-materialistic hypothesis still dominates all branches of science with the exception of physics. Distorted forms of the second explanatory hypothesis dominated Western biology until 1895, and still dominate the rational thought of Eastern civilization. The second type, scientifically formulated, has been rising to dominance in the rational thought of Western civilization during the twentieth century (conflicting with mechanistic-materialism) and may dominate Western thought in the nuclear age. We will take up the developments leading to this situation in the history of field theory. The existence of a common fundamental hypothesis to explain all the phenomena known to man in both Eastern and Western cultures, is one of the main reasons it can be realistically hoped that a world culture can be developed for all humanity in the twentieth century.

We shall now briefly consider some of the basic ideas involved in the mechanistic-materialism and field-process doctrines. The doctrine of mechanistic-materialism, as it has come to us, has two central aspects—the doctrine of atomism and the idea of natural law. The doctrine of atomism was contributed to Western thought by Democritus around 500 B.C. According to this doctrine, apparently dissimilar phenomena in a particular sphere are to be explained in terms of qualitatively identical parts and their spatio-temporal relations (interactions). Thus, in order to explain the diverse phenomena (e.g., heat, electromagnetism, gravitational attraction, etc.) on the physical level (e.g., atomistic), one must first discover 50
the invariant structure (the atom) on that level. Then one can explain the phenomena in terms of how these invariants interact with one another over space and time. (Thus, atoms and molecules randomly moving about in space and time account for the phenomenon we call heat. This is the kinetic theory of heat.) To use another example, the qualitatively identical parts or the invariant structure on the neuro-physiological level is the neuron in its various specialized forms. Since the neurons are spatially fixed in

the nervous system, the interactions between these invariants are temporarily mediated by the agency of the nerve impulse. Thus, such apparently diverse phenomena as the psychological attributes of intensity, quality, time, space perception, emotion, etc., are to be explained in terms of nerve impulses moving between specialized neurons or within their interconnections such as in neural nets. (This view, called connectionism, is currently the dominant hypothesis in physiological psychology.)

A second central aspect of mechanistic-materialism is the idea of natural law. This doctrine was set forth by Pythagoras in about 530 B.C. This doctrine asserted that within, and at the basis of, nature there are certain laws the operation of which orders the events of nature. These laws and their operations are hence responsible for the harmony, the orderly phenomena and the symmetry of structure and movement observed in nature, particularly in astronomy. This unsophisticated doctrine later became the doctrine of mathematical law—the idea that reality can be directly represented in man's thinking via a logically uniform system of thought. In other words, the events taking place in space and time can be represented in man's thinking via a mathematical law. In this new doctrine, our sense-experiences are ultimately derived from the environment but the law is man-made, while in Pythagoras's system both our sense experiences and laws were ultimately derivable from (or discoverable in) the environment.

The mechanistic-materialistic viewpoint is regarded as a fundamental explanatory hypothesis because each higher level of the organizational hierarchy, supposedly, can be reduced to simpler invariant units until presumably the level of ultimate particles is reached. For example, the properties of the group may be reduced to the psychological characteristics of the individual, the individual's characteristics similarly can be reduced to the properties of physiological sub-systems, these can be reduced to the properties of the cell, etc. Thus, it is the ultimate particles (the hydrogen atom or nuclear particles), their interactions and combinations, and subsequent evolution that supposedly led to all higher levels of the organizational hierarchy. 51

The second type of explanatory hypothesis is associated with the name of Heraclitus who lived about 500 B.C. This was the doctrine that the invariant of explanation is not the static structure and its temporal and spatial interactions but that the basic explanatory hypothesis is the dynamic process. (L. L. Whyte traces the long history of this concept in his book *The Next Development in Man*.)

Cast into modern terms, the dynamic process may be defined as that organizing center which brings about continual one-way (evolutionary) change on a particular organizational level through

the process's continual controlling influence over all structures on that level. The process theorist points to the existence of the organizational hierarchy in nature which has three fundamental differentiated parts—the physical, the biological, and the sociological. At the basis of, and interconnecting, these three differentiated aspects of the organizational hierarchy in space and/or time, the process theorists assert, one will find one and the same (field) process which we shall call the unitary process. This unitary process, moreover, works on one fundamental principle which we shall call the unitary principle. The unitary process and the unitary principle, thus, will be found in a highly differentiated form on all levels but it is, nevertheless, one and the same process and principle.

The process doctrine is a fundamental explanatory doctrine because it asserts that all phenomena and all the knowledge of man can be explained on the basis of the unitary process and the unitary principle plus a knowledge of the conditions under which a particular structural organization is operating. This doctrine implies that from the beginning, matter, biological process, and the group were present in potential form in the unitary process and needed only the differentiating effect of a varying environment to bring forth the diverse physical, biological and sociological phenomena of our current observations and experiences. Life, mind, matter, and the social group thus arose from this unitary (field) process and today operate on its intrinsic principles. The fundamental phenomena of the three major sciences: matter of physics, biological process (life and mind) of biology, and group of sociology, should be amenable to explanation by utilizing the intrinsic properties of the unitary process and the unitary principle. This explanatory hypothesis applied to all aspects of nature is, and has been, in sharp and fundamental opposition to the mechanistic-materialistic doctrine. It is, for example, more often a qualitative approach rather than a quantitative approach. Its main field of 52
inquiry, moreover, is not physics but biology and sociology.

The process concept was that of Aristotle's and, when not concerned explicitly with the human-like deity concept, it is the central doctrine of interest of theologically oriented thought—perhaps because from the process viewpoint, the universe itself can be conceived as a creator. It was Aristotle, however, who placed on this explanatory doctrine the onus of vitalism and orthogenesis which has led to its low repute in modern Western thought. According to Aristotle's view (which we shall trace more fully below), the fundamental process was that of spontaneous generation which operated on a vitalistic principle. The organizational control of this process and principle was of such a nature as to guide biological and sociological evolution toward perfection of form, function, and

system. This is the view that has come to be called orthogenesis. From this point of view, a perfecting principle is supposedly inherent in biological and social structure which is not influenced by environmental conditions. Aristotle's views concerning this fundamental process in biology, after a long and unbroken series of defeats by experimental method, finally died out in biological thought in 1895, the same year, as we shall see, in which mechanistic-materialism was abandoned once and for all as a fundamental explanatory hypothesis in basic physical thought.

Before we go on to consider the rise of scientific method in Western civilization and its decisive effect on the above two fundamental explanatory hypotheses, let us briefly consider an evaluation of the relative contributions to scientific progress of the two explanatory hypotheses which have been discussed. The quotation is taken from Munitz's book *Theories of the Universe,* (1957):

> The concept of an infinite and irrational universe—the concept of a universe whose order arises out of a blind interplay of atoms rather than a universe that is a product of deliberate design—has led to all the greatest advances in scientific thinking especially in astronomy down to the present day.

Munitz's evaluation is quite accurate as far as it concerns the materialistic vs. the deity concept, for the latter viewpoint has contributed relatively little to scientific progress. But the evaluation does not hold so well when the contributions of the materialistic doctrine are placed against those of the field-process point of view. This is particularly true of the twentieth century and of the biological and sociological sciences in particular. During the twentieth century, and particularly in the present decade, the concept of field-process as a basic explanatory hypothesis has found its chief experimental support from micro-biology, biochemistry and from their unwitting(mechanistic-materialistic) allies—physical chemistry and thermodynamics. The field 53
aspect of the field-process doctrine, moreover, has received staunch support from basic physical thought since the beginning of the twentieth century. It was not, however, until 1949 that the process concept entered basic physical thought in the form of Whyte's book *The Unitary Principle in Physics and Biology.* It might well be, however, that the main contribution of field-process concepts lie in the future. Perhaps the emphasis of fundamental thought in science may shift from the physical sciences to the biological and sociological sciences. The tendency by Munitz and others to lump the deity and process concepts together or to use the failure of vitalism as an indication of the failure of the process concept is unwarranted. The two doctrines are different explanatory hypotheses; their common opposition to a blind and random universe do not make them similar in fundamental construct. It was, moreover, only Aristotle's distortion (and another distortion to be considered

immediately below) of the process concept which was repudiated in biology and not the field-process concept itself.

A particularly widespread distortion of the process concept is to be had in the numerous dualistic unitary-principle and process doctrines that are to be found in many Eastern and Western philosophical systems. The origin of these dualistic unitary principles and process doctrines can be traced to the cultural era of superstition. Long ago, some of our ancestors were deeply impressed with the "powers" of the sexual process and with the dichotomy of the two sexes. Gradually, mistaken notions about the "powers" of the sexual process and the two sexes, birth and fertility, etc., arose and, with the subsequent reification of the symbols representing the sexual process and the two sexes, these dualistic principles and processes, fully endowed with imagined powers, came into being. These dualistic notions, having their ultimate empirical referents in the sexual process and in the dichotomy of the two sexes, laid the foundation for the art of alchemy in China and India and were later transferred to classical Greece via Persia. They also contributed greatly to the founding of modern chemistry and medicine. But it was from alchemy that these dualistic ideas ultimately found their way into the dualisms and mysticism of philosophical systems of the East and West.

Thus, the many dualistic concepts and dualistic unitary principles that exist today have as their basis the reification of concepts that are ultimately traceable to mistaken notions concerning the "powers" of the sexual process and the dichotomy of the two sexes. Examples of these doctrines are the Yin-Yang principle of Chinese philosophy and the thesis-antithesis principle 54
of process of dialectic method, its modern applications stemming from Hegel and applied to economic theory by Marx. The principles can be said to be dualistic for they ascribe polar qualities (such as night and day, good and evil, hot and cold, super-ego and id, negative and positive, female and male, kind and subject, pain and pleasure, capitalism and socialism, etc., etc.) to two opposing aspects that are supposedly involved in some particular process. Besides these dichotomies, which are a salient characteristic of dualistic thought, these doctrines can be further seen to be dualistic by the adeptness with which a philosophical system can be transformed from one "monism" to another "monism." For example, Hegel's monism was an idealistic (mind) monism and Marx's monism was an economic-materialistic (matter) monism. Neither doctrine, moreover, makes a serious attempt to account for the aspects of nature lying outside the realm of its philosophic assumptions. For example, neither Marx nor Hegel nor their followers have made a serious attempt to account for the other aspect of the mind-body (or mind-matter) dichotomy which both doctrines imply exist. These doctrines can be seen to be distortions of the process concept because biological and sociological processes simply do not operate on the principle of the combination of two opposites, if these opposites even ever exist. Nor can the process of evolution, development, or learning be described as a synthesis of two opposites from which a new whole arises.

In modern field-process theory, the unitary principle does indeed have two contrasting aspects but they do not form a dichotomy nor are they in