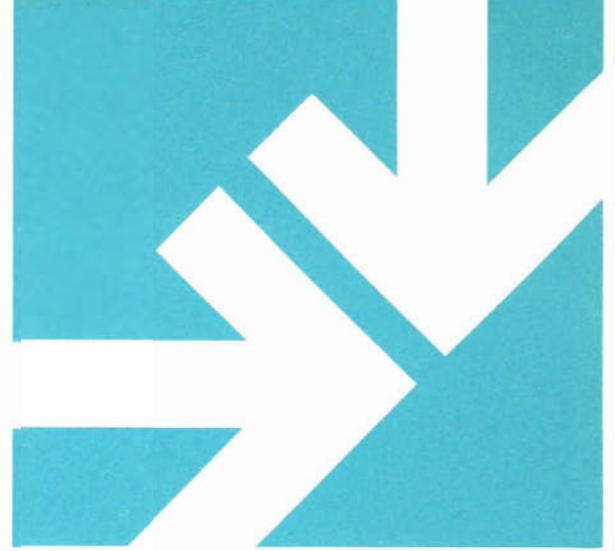


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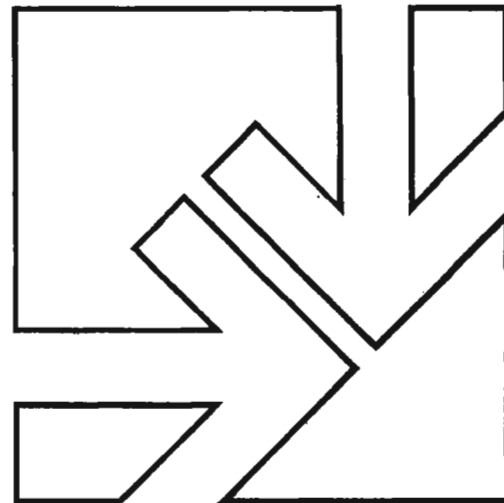
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THE NEED FOR A NEW APPROACH IN PSYCHOLOGY

JOHN FINCH*

A discussion of the bankruptcy of the merely scientific approach to an understanding of man on the grounds that it subjects man to the procustean bed of scientific methodology. The author has no quarrel with science per se if it recognizes its limitations, but points out that when psychology broke with philosophy in an attempt to become "scientific," it gained some valuable data, but in making man a material object, subject to the laws of cause-effect, determinism, rationalism, biologism, (all synonyms for each other in a real sense), it refused to cope with the very man-ness of man, his spirit. It is this spirit dimension which existential psychology is seeing more and more clearly as characteristically man. Man in existence and as an existent, is the very psyche of psychology. However, the author senses that the phenomenological turn is capable of lapsing back into scientism by its very pre-occupation with the here-and-now. This is to view man as earthbound and earthy and confined within this perimeter, whereas in man's reach for meaning, he not only transcends himself, but he likewise transcends the here-and-now. The author, therefore, suggests, in conclusion, that only a psychology which accepts Weltanschauung as germane to its concern can be considered valid for understanding man.

The subject matter of this paper falls into two natural divisions: the philosophical and the historical. By the philosophical, I mean that age-long venture in which man has been engaged to resolve the riddles and perplexities of life in all its aspects. By the historical, I refer to that process or quest which has led man through one frustration after another in a ceaseless pursuit to find that particular method that will unfold all knowledge. Man may be described as that

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being who has had an insatiable hunger to conquer all things. This conquest implies a need to bring everything under his control, to "have all knowledge," to use St. Paul's phrase (1 Cor. 13:2) or, as Moffatt translates it, to "fathom all mysteries and secret lore." It is at this juncture that we are confronted by the problem that is absolutely fundamental to our endeavor.

Stated in its simplest form, it is the difference between a logical positivistic approach to understanding data and the existential approach. Thus, we are forced back to asking some very elementary but profound questions: How do we know what we know? Is our sense data reliable? Can we apply mathematical formulae to tabulate sense data in such a manner as to "give" it predictability? Is predictability a valid goal? Can the methodology of the "scientist" be carried over into areas of non-materialistic science? If so-called materialistic science itself is aware of the limitations of its methodology and starts to question its epistemological presuppositions, are other disciplines—such as psychology and religion—safe in not raising questions about their methodological presuppositions? To illustrate: Can psychology afford to give its sole allegiance to the philosophical position known as logical positivism without at the same time eliminating part of the very subject data under study, viz. the knower himself? Can religion afford to create so much security for the individual by an impregnable fortress of rationalistic dogmatics as to dispense with the knight of faith?

** I have used quotations with this word "scientist" because scientists of the highest caliber are rejecting a static view of the world. Scientists such as Bergmann, in his Gifford Lectures, 1907; S. A. Eddington, in "The Nature of the Physical World," 1928; in 1900 physicists questioned the causalistic methodology of physics; in 1905 Einstein published his first treatise on the theory of relativity, saying in 1929, "That under the influence of the facts of atomic physics, contemporary physics earnestly doubts the practicability of a rigid causality;" Heinrich Gomperz, in "The Problem of the Freedom of the Will;" and see also Whitehead in "Science and the Modern World," etc.)

These are not new questions and the alternatives posed are not theoretical. Essentially, throughout the centuries this ball has been tossed back and forth in philosophical speculations. But, more recently, man has discovered afresh the truth that knowledge alone cannot save him, but a *commitment* to truth. We live under the cloud of Hiroshima, forcing all of us to live anxiously, not knowing what a day may bring forth. We are becoming somewhat more aware of our need to ask not *what* is reality like, but how do I *relate* to reality, or how do I become a real or authentic person? As Karl Jaspers indicates, "Philosophy is more than cogent intellectual knowledge and fundamentally different from, yet not opposite to science. The distinguishing feature of the philosophical mind, in contradistinction to the scientific mind, is characterized as personal faith. Though always allied with knowledge, philosophical faith transcends object cognition."¹

What Jaspers says about the philosopher's faith is no different from the underlying faith of the so-called scientist who adheres to logical positivism. He limits himself, shall I say, by a lack of faith to certain philosophical presuppositions. This limitation tends to put faith in a methodology above a faithful confrontation by the everchanging facts. These propositions are very accurately and succinctly summarized by Peter Koestenbaum as follows: "(1) That meaning is tied to method of confirmation. (2) That confirmation is ultimately based on the 'observable characteristics of physical objects.' and (3) That a proposition, to be confirmable and, consequently, meaningful, must be capable of precise and preferably measurable formulation."² Koestenbaum further points out that "these general features represent the positivistic conception of the structure of cognitive meaning, wherever it is encountered, and form the preamble and paradigm for the notion of scientific theory and explanation."³

This is one of the streams that runs through the history of philosophy as certain of the philosophers attempted to find a ground for knowledge that would be stable, unyielding, and *rationaly* incontrovertible. A ground, so to speak, outside of themselves, and in this sense objective. As more and more stress was placed on man's *rationality*, man as man withered so that the branch, being severed from the source of life, likewise withered. By stressing man's rationality as primary, he became so obsessed with his discovery that he mistook the essence for existence, and even made the *rational* error of mistaking a *part*, namely reason, for the *whole*, namely man. The soul became subservient to the system.

From the primacy of Aristotelian logic, to the Thomistic position which defines "man as a rational animal," the Renaissance attitude attempted *Self-sufficiency* through the priority of reason. This rationalistic bias can be noted, for instance, in the "Autonomy of Moral Reason, in Sir Francis Bacon's Thought (1561 to 1626); in the pantheistic monism of Bruno (1548 to 1600);

Spinoza (1632 to 1677); and Goethe (1749 to 1832); the naturalistic empiricism of science; the logical positivism of Comte (1798 to 1857); or the period's initial intellectual doubt, which was itself an indication of the period's intention to submit all to the bar of reason in its singular autonomy."⁴

This rationalistic thrust nowhere comes to a more *reasonable* hiatus than in Descartes (1596 to 1650) and Hegel (1770 to 1831).

Descartes attempted to find a foundation for knowledge that would be stable, unyielding, and incontrovertible. This he found by running the principle of doubt to the ground. He disclosed in doubt itself, the reality of thought. To doubt is to think. Hence his famous "Cogito, Ergo Sum"—the clue to his system.

"It is to be observed, however, that this is no syllogism: it is an axiom. The conclusion is identical with the premise. It is a self-evident proposition."⁵

Or, as Jacques Maritain observes: "He (Descartes) has reduced knowledge to an abyss of uncertainty by classifying human thought along with angelic thought' (p. 78). This knowledge becomes inhuman through trying to be superhuman. That is the ground, not only of Descartes' brutal disregard for the Humanities . . . it is the principle and origin of the profound *inhumanity* of our modern science (pp. 92-93). We see today the delightful outcome of this materialization of science, and the dismaying intellectual poverty characteristic of a progress (wonderful in its own way) of technical specialization and mechanical process" (p. 94)⁶.

Descartes' gross error apparently lies in his isolation of reason as an *a priori*—something than which nothing is prior, i.e., something that is "prior to experience and innate in the mind." But, where if you please, do you rest your fulcrum of rationality if not in experience itself and the experiencer? In asserting "the complete autonomy of human reason, one merely closes the mind upon its own processes." But, if other results emerge, it is because another methodology has surreptitiously crept in, viz., the experience of the experiencer himself.

For, what is really meant by Descartes' famous dictum: "Cogito, Ergo Sum" is: "I think, therefore, I am a thinker! To be a thinker is to deliver one's self into a mere knowing."⁷ But, mere knowing is an attempt to bifurcate the knower from that which is known and is tantamount to creating such a logic tight system "that the propounder of the system in propounding what was more important than anything else in the world, should, by a series of irrefutable propositions, delete himself from the system."⁸

What we are stating is that Cartesian logic leads us not to thought as 'a priori', but to existence itself. And, whereas his proposition reads "because I think, therefore, I exist," it should more properly read "because I exist, therefore, I think." This would be to recognize

"the *existential* qualification which surrounds and conditions all abstract thoughts,"⁹ and would make us cognizant of the very ground of all knowing, and without which ground, all knowing is mere fragmentation.

Allow me to proceed one step further in drawing out the implications of this existential qualification. If, in the domain of so-called scientific knowledge, this dimension is present and must be reckoned with, namely, the relation of the known to the knower, then a relationship with truth is uncovered. This means that the end of knowing involves the knower in a relationship with truth. Stated conversely, this suggests that truth is unavailable except through a relationship.

Moving to that other great dialectician, Hegel, for a moment, we must ask: "Do we really have anything different here?" Speaking of Descartes, Hegel says, "in this new age, the leading principle is thought, and thought which originates from itself."¹⁰ Once again, he appears to stress the "a priori" character of thought, of reason. But, how does he come upon such a derivation? As Kierkegaard points out, "it is impossible to discover within the instrumentality of reason itself the meaning of the whole"¹¹ or, to put it more simply, a *part* cannot explain the *whole*. Hegel *assumes* that the whole system of things is implicit in the notion of being or in the system of reason itself, but this does not follow. Reason as a system of principles is only a formal outline of possibility, and contains nothing specific and actual. The actual is *found*, not deduced; it is a fact of experience, not an implication of reason."¹²

It would reach beyond the scope of this discussion to attempt even a partial exegesis of Hegel's system, but we must pause to note that Hegel so deified reason that he even went so far as to try to derive *being* therefrom. Thus he sets pure being over against "nothing, pure nothing" which he has already identified as one and the same, and then proceeds to the point where pure being passes over into pure nothing and there *becoming* is born, (nevertheless he fails to account for this passing or movement). There are perhaps two possible ways that this could happen: (1) That Hegel, like God, was directly implied in his philosophy; or (2) on a lesser scale, like the magician, he could, by clever manipulation and sleight of hand, extract the rabbit from the hat.

Suppose, now, we follow the repercussions of these rationalistic premises and positivistic presuppositions into the area of psychology and its effect on a view of man.

In order to be consistent with its method, man has had to be objectified, made into an object, studied as a part of the material phenomena and subjected to the criteria of such scientific presuppositions.

What, then, is man? In Behavioristic Psychology, he is a biological entity with a stimulus-response mechanism, devoid of freedom and by implication bereft of responsibility. To summarize the position of J. B.

Watson, "Psychology is purely objective natural science. No division between man and brute. The *independent value of behavioral material*. Fallacy of the analogical interpretation of all behavior from the point of view of consciousness. Psychology must discard all reference to consciousness. Behaviorism avoids the dangers of parallelism and of interactionism. Animals and men are to be studied in the same way. Dissatisfaction with the fact that psychology has no realm of application. Avoidance of introspection. Denial that the realm of psychics is open to experimentation."¹³

Thus, at any rate, man is a biological organism. What, then, is anxiety? It must be some form of biological frustration. When the instinctual drives are thwarted, anxiety results. When the libidinal flow is blocked, the damming up of such a flow causes anxiety. As Ruth Monroe suggests in her *Schools of Psychoanalytic Thought*, (p. 177), for e.g., "It is characteristic of Freud that he could not accept even anxiety as a simple fact, but felt that it must be biologically explicable."¹⁴ Now, we must not become guilty of lampooning Freud, for his genius will stand as a milestone through the ages. But, neither can we take away from him what he insisted on clinging to, namely, his *Project*, in which he determined to "furnish us with a psychology which shall be a natural science."¹⁵

What is amiss about this way of conceiving man, in my view, is the emphasis on the physiological. Given the naturalistic and biological assumptions, this becomes quite understandable. But, this is precisely what we are challenging. Man is more than physiological phenomena. Freud *did* have some kind of teleology; namely, his "pleasure principle," but, as we have demonstrated with reference to the rationalism of the era, it bifurcated essence from existence and to the detriment of its own findings, concentrated on essence. If he had seen life whole, and man in his existential dimension, he may even have noted that anxiety is the creative directive to every being to be one's self, relentlessly. "Anxiety is the moment (or series of moments) when man is thrust inward upon his own nudity, when his history confronts nullity, when the question as to his own significance balances between life and death."¹⁶

This hiatus results from the assumption that knowledge can be separated from existence. I want to suggest that reason divorced from life is an attempt to rationalize. It is to try to work out a system that does not require the rationalist to do anything more than systematize. It is to try to confront *life's* challenges with an *intellectual* answer. It is, to use Pascal's word, a *divertissement*—a diversion from confronting the self with reality.¹⁷

The intensity of emotionality that gets associated with dogmatic systems itself evidences the ponderous weight placed on the system. The system becomes identified with absolute truth and very easily a person's faith rests in the absolute *nature* of the

system instead of in the fruits that result from the relationship of the person to the truth. Thus, the system or reason becomes "the mask by which the mind covers over moral impotence, (irresponsibility) and skillfully escapes detection."¹⁸ This states incisively what I mean when I say that the bifurcation of essence from existence, of reason from life, makes reason a rationalization. Or, to use Jasper's phrase, "non-being masquerading as life triumphs in the incomprehensible configurations of sophistry."¹⁹

This fact has been developed much more fully in Jasper's work *Great Philosophers*, where he makes it more than evident that philosophers were not so involved in a theoretical and dispassionate pursuit of truth as they were attempting to rationalize themselves out of anxiety.

"Kierkegaard also has noted the case wherewith the philosopher builds with his mind a stately palace for his thoughts, while he *lives* in the dog kennel outside!"

"Thus, Descartes . . . died of an inflammation of the lungs at the age of fifty-four years—just before he had completed the application of his method to medicine, which, he little doubted, would easily have kept him alive for a hundred years!"²⁰

One wonders if Descartes was attempting to allay his anxiety via a dogmatic system that *proved* he could stay the last avenger!

This indeed, is what functional emotional illness seems to be: an attempt to confront life with an inadequate, outworn, outmoded strategy; namely, a strategy which attempts to substitute symptoms and systems instead of confronting life.²¹

"Socrates insisted on the belief in moral values, on an austere conduct of life, and on the unity of wisdom, knowledge and virtue."²²

In this connection, Rollo May appears to make the same demand for unifying wisdom or insight with action. He points out, "it is well known to every therapist that patients can talk theoretically and academically from now 'till doomsday about their problems and not really be affected' indeed, particularly in cases of intellectual and professional patients, this very talking, though it may masquerade under the cloak of unbiased and unprejudiced inquiry into what is going on, is often the defense against seeing the truth and against committing one's self; a defense, indeed, against one's own vitality. The patient's talking will not help him to get to the reality until he can experience something or some issue in which he has an immediate and absolute stake . . . the patient must find or discover some point in his existence where he can commit himself before he can permit himself even to *see* the truth of what he is doing."²³ Then again, he continues, "the significance of commitment is not that it is simply a vaguely good thing or ethically to be advised, it is a necessary prerequisite,

rather, for seeing truth. This involves a crucial point which has never, to my knowledge, been fully taken into account in writings on psychotherapy; namely, that *decision precedes knowledge*. We have worked normally on the assumption that, as the patient gets more and more knowledge and insight about himself, he will make the appropriate decisions. This is a half-truth. The second half of the truth is generally overlooked; namely, that the patient cannot permit himself to get insight or knowledge until he is ready to decide, takes a decisive orientation to life, and has made the preliminary decisions along the way."²⁴

In another source book of wisdom, this idea is aptly summarized: "If any man will do his will, he shall know of the doctrine."²⁵

This is no different from what Allport is apparently saying: "The developed personality will not fabricate his religion out of some emotional fragment, but will seek a theory of being in which all fragments are meaningfully ordered."²⁶

Thence, to the historical aspects of our subject, we first discover psychology as part and parcel of the primeval mass of philosophy. Man's curiosity and search for truth found him reaching out and touching vast uncharted seas of knowledge. Little by little one and another specialty broke away from the parent tree and sponsored its claims to be a discipline in its own right. But, again, the important question of validation of knowledge began to challenge issues. This is where Descartes' (1596 to 1650) formula of the priority of reason gave the nudge which eventuated 150 years later in the logical positivism of Auguste Comte (1798 to 1857). It is not as though there were no dissenting voices, for there were. Perhaps among the most prominent of the early dissenters was Blaise Pascal, who at the age of 22 rather embarrassed Descartes. Then, too, there were Kant with his *Critique of Pure Reason*, or Brentano, Scheler, Nietzsche and others. But, it is not alone the names stacked on one side of the ledger or the other that lends significance to the argument, but rather the spirit of the 18th century enlightenment with its "questioning of traditional doctrines and values, a tendency toward individualism, and an emphasis on the idea of universal human progress, the empirical method in science, and the free use of *the* reason."²⁷

Historically, man had moved from the Dark Ages (476 to 1000 A.D.) with its suppressions and was bursting his seams in a new-found freedom of self-aggrandizement which showed itself impatient of all restraints. From misery, fear and ignorance, man now moved to self-deification in which he saw himself as in full possession of all power and all knowledge and once and for all rid of such trivia as faith and soul and God. It was to Comte's logical positivism he turned for the clue to answer all questions. And, when the object of his concern became man, he construed this object as a thing, divorced from all philosophical antecedents, and as subject to the laws of cause and effect and

nothing more than a stimulus-response mechanism, as J. B. Watson told us, "with no division between man and brute," and to be studied as an object of natural science. Pavlov (1849-1936) was a child of this age. No less was Freud (1856-1939), who set himself the task of demonstrating that psychical states were physical states and as Munroe indicated, "biologically explicable". Thus we arrive at what might be termed a two-dimensional view of man: stimulus-response, or body-mind relation. Somewhat like Hegel's thesis-antithesis, even this type of psychology had surreptitiously to introduce the characteristic of transcendence to achieve synthesis or becoming. It seems reasonable (allow me to use this term) to assume that the logical positivistic method could not quite contain all that the subject data involved. The materialistic scientific analogy fell short of comprehending the full stature of man. There were two alternatives open. One was to abandon the scientific method as inadequate to its subject. The other was to constrain man on this procrustean bed. Or, perhaps a third alternative. Recognize the limitations of the scientific method, derive from it all the information possible, but under no circumstances limit the subject of knowledge to its methodology. As Gordon Allport suggests, "we should exercise great caution when we extrapolate the assumptions, methods, and concepts of natural and biological science to our subject matter. In particular, we should refuse to carry over the indifference of other sciences to the problem of individuality."²⁸

It is this third alternative, it seems to me, that has been called into the service of understanding man as (at least) a tri-dimensional being: body-mind-spirit. Now, of course, these are not construed as three separate entities. Any separation is merely an attempt to speak to the various aspects of this highly complex and complicated being, Man. None of the terms is crystal clear, but the least understood is the term spirit. Perhaps the handiest way to comprehend spirit is to see it as that characteristic of man that lifts him above himself and allows him to see himself objectively. To quote Allport again: "We maintain, therefore, that personality is governed not by the impact of stimuli upon a slender endowment of drives common to the species. Its process of becoming is governed, as well, by a disposition to realize its possibilities, i.e., to become characteristically human at all stages of development. And, one of the capacities most urgent is individuation, the formation of an individual style of life that is self-aware, self-critical, and self-enhancing."²⁹ Put differently, what Allport sees as the chief quality of man may be termed self-transcendence, freedom and responsibility. This, indeed, is how I have come to recognize the dimension of spirit.³⁰

It is the pressure of such data as is incapable of inclusion within the framework of the naturalistic scientific methodology that has brought into being the discipline known as phenomenology. In the tradition of Hamilton's *Lectures on Metaphysics* (1858) and Moritz Lezarus' *Leben Der Seele*, psychology and phenom-

ology are distinguished from one another: "psychology seeks the causal explanation of mental life, whereas, the task of phenomenology is descriptive."³¹ If nothing else was accomplished, phenomenology with its adherents like Husserl, Brentano, Scheler, etc. achieved two important things. It introduced a new departure in the study of man which broke with the naturalistic method of science, and it emphasized the spirit dimension in man which transcends that method.

This is a far step forward and a step in the right direction, but it still omits an area of research which cannot be left to the biological sciences as important as they are, nor to phenomenology which chooses to ignore it by its preoccupation with the here-and-now, but must be the concern of the Christian whether theologian or psychologist. Logical positivism has no place for the dimension of the spirit. Phenomenology concentrates on a description of the phenomena and their meaningful relations that point to this dimension. Only the Christian raises the question of ontology in relation to this spirit dimension in all its ramifications. He asks: Is this what is understood by the phrase "made in the image of God?" Can this spirit be identified with the *Imago Dei*? Christian Existentialism goes beyond phenomenology while yet accepting its description of spirit as free, responsible and self-transcending, to state that these only have meaning as they relate to Another who created it. Christian Existentialism submits "The spirit cannot be grounded in itself. It must be grounded in the Power which posited it."³²

After all the meaningful issues of life have been explored, it seems meaningless does it not, to omit some reference to and understanding of the meaning of life itself, as a whole? Frankl³³ is one among many researchers who points out that *meaning* spells the difference between life and death for people. His entire psychology is based on this premise. Meaning and its difference to life and death is a phenomenological fact. Why, then, should it be unacceptable if a *Weltanschauung* which includes not only a meaningful relation to man, but also a meaningful relation to God, be considered a most integral part of the human psyche? For, if the meaning associated with the variables of the here and now are seen to make the difference between life and death, surely meaning in its widest and deepest dimensions involving a *Weltanschauung*, cannot be omitted from the most careful scrutiny. Of course, we should expect to encounter all kinds of problems of validation and verification, but then seeking solutions to problems is the way to proceed rather than to allow our methodology to discord the evidence.

We have noted the dimension of the spirit burst through the methods of scientific naturalism to create a new discipline in phenomenology. Are we reaching too far beyond the pale of good sense when we suggest that the Christian understanding of man, as made in the image of God, may create a new approach to psychotherapy? Does it not seem valid to assume with

Augustine that the causes of our emotional pains and pangs derive from a sense of alienation? Is he making a theological statement when he says: "Thou hast made us for Thyself and our hearts are restless until they rest in Thee?"³⁴ Or, is this psychologically valid? Allport, to quote him again, says: "An adequate psychology, would, in effect be a psychology of the ego."³⁵ He identifies this ego with Adler's life-style. I am proposing that this life-style may be identified with a way of life, a strategy of life, a philosophy of life, in which God's Spirit bears witness with our spirits that we are the children of God because we are existentially involved in the truth and thus come to an awareness of our freedom in responsibility as heirs and joint heirs with Christ. This strikes at the root of the meaninglessness of the ungrounded or misgrounded existence so characteristic of functional emotional illness.

"Just how far the existentialist movement, already well developed in philosophy, literature, and theology, will affect the psychology of personality, we cannot yet predict. Already it seems to be a needed blood transfusion. The propositions of existentialism are for the most part stated abstractly or in metaphor. But, even so, they admonish psychology to strengthen itself in those areas where today it is weak. Existentialism calls for a doctrine of an active intellect, for more emphasis upon appropriate functions, including self-objectification and oriented becoming. In particular, it calls for a wider and fresher view of anxiety, of courage, and of freedom."³⁶

"As a (natural) science, psychology can neither prove nor disprove religious claims to truth . . . (but it) can study man as a self-assertive, self-critical, and self-improving individual whose passion for integrity and for a meaningful relation to the whole of Being is his most distinctive capacity. By devoting itself to the entire course of becoming—leaving out no shred of evidence and no level of development—psychology can add progressively to man's self-knowledge. And, as man increases in self-knowledge he will be better able to bind himself wholesomely and wisely to the process of creation.

"The final truths of religion are unknown, but a psychology that impedes understanding of the religious potentialities of man scarcely deserves to be called a logos of the human psyche at all."³⁷

CONCLUSION:

This paper sponsors the view that the pursuit of knowledge transcends the methodological presuppositions of natural science. It has no quarrel with these presuppositions except as the insistence is made that *all* knowledge be validated by these formulations. Insofar as psychology has adopted logical positivism as its criterion of truth for an understanding of man, it has had to exclude data that invalidates, by reification, any real comprehension of the nature of man. At this point, phenomenology has offered a resolution of this deadlock by focusing on the phenomena via descriptive

analysis. But, even here, a more comprehensive approach seems necessary. An approach that can bind the several elements into a meaningful whole as existentialism attempts to do. Now, from our Christian perspectives, God as seen in the face of Jesus Christ, is a most integral part of this meaningful whole. This is an assumption. This assumption has been validated through the centuries by innumerable case histories of conversion. This new approach to psychology anticipates doing research that will explore and understand the religious potentialities in man so that a psychology may emerge that deserves to be called a logos of the human psyche.

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MODES OF EXPLANATION IN BIOLOGY

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I am impressed with your wisdom in choice of general theme for this symposium.** The nature of explanation is a central problem in the sciences, although seldom recognized as such. Which of two explanations is a better one? This question infers some criteria for choice.

The problem is also a central issue in relating science with faith. One of the claims made for faith is that thereby one can have better answers (or explanations) than science is able to provide. Let us consider, for example, two different statements: (a) Now that science has produced a satisfactory explanation, it is no longer necessary to believe in God. (b) What science has found is merely a description not really an explanation. The failure of science to find a final explanation is, in fact, evidence that God must be operating here.

These claims are clearly incompatible if they are phrased in the same language. It is possible, however, that "explanation" is being used in different senses, and the statements may not really be in opposition. I shall try to show that the apparent conflict results from different understandings of "explanation". Furthermore, in my opinion, neither conclusion is justified.

The person in search of an explanation should be prepared to answer two questions: (a) What is it you want explained? (b) What kind of explanation do you want? In the first question the general area of explanation is marked out. I am to limit myself to biology, but even this is a tremendous area. If I were to give each of you a chance to write one question, the variety in response would be great, representing different interests and backgrounds. Furthermore, the questions we ask now are quite different from those we asked as children. There are some questions we never answer; we simply get over them.

But we must also consider what kind of explanation we wish. We have all had the experience of asking a

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question only to receive an answer in terms far too difficult for us, or far too simple. Thus the acceptability of an explanation involves personal choice. Braithwaite (1, p. 348) considers an explanation to be "an answer to a 'Why?' question which gives some intellectual satisfaction." An answer that gives partial or complete intellectual satisfaction to one person may give none whatever to another person at a different stage of intellectual development.

Now let me ask a simple biological question: Why does a cat purr? The question occurred to me as I watched the two cats in our house — one a pure Siamese female, the other a half-Siamese male. The Siamese female purrs only occasionally and then very quietly. The male purrs loudly at the slightest sign of attention. So I wondered, why does a cat purr anyway?

Your answer to this question might take the form: (a) Because it is contented, or

(b) In order to get further attention, to show you that he likes you. These are quite different explanations, and different answers would satisfy different persons. Furthermore any such answer is subject to further questions:

(c) What apparatus does the cat possess to make purring possible?

(d) What elicits purring? Is it intentional or not?

(e) What function does this behavior have?

(f) How did it all get started? Why are the genes maintained?

Braithwaite (1, p. 347) pointed out that: "At each stage of explanation a 'Why' question can significantly be asked of the explanatory hypotheses; there is no ultimate end to the hierarchy of scientific explanation, and thus no completely final explanation."

To some, this may come as a disappointment, or as evidence of some weakness in science. Would it not be more satisfactory as an explanation to answer that "God made cats that way." This is a perfectly acceptable statement concerning any natural phenomenon, but it is a different kind of answer. I would prefer to call it an "affirmation" rather than an "explanation." I would not wish to be given a choice but would prefer to have both affirmation and explanation.

Now let us try a more serious biological question. What is the cause of complex malformations in man? Perhaps the best known of these is mongolism, which involves defects in the brain, heart, skeletal system and other parts of the body. What can interfere with so many processes at once? Many speculations were proposed (such as fluorides in the drinking water or airplane trips by the mothers during pregnancy), but in 1959 the presence of an extra chromosome in affected children was discovered. This "explanation"

produced a tremendous intellectual excitement and satisfaction among scientists. It was not long, however, before new questions became apparent, requiring explanation at a different level. What causes the error in germ cell formation that leads to the presence of the extra chromosome? How does the extra chromosome produce this particular set of malformations?

From this problem, let me shift to the complexity of life in general, particularly as seen in cells. After the development of the microscope revealed the cellular nature of living material, it was realized that the mystery of life must somehow reside in these cells. The living stuff that made up the cells was called "protoplasm."

At this early period many scientists assumed that the phenomena of living matter could eventually be explained in terms of physical and chemical principles. Thus, protoplasm was described as the "physical basis of life." They did not claim to understand everything at that time, but insisted that in principle this description was possible.

To other scientists this approach seemed to be too simple, and too materialistic. These workers insisted that some other factor must be present in living material — a factor X, or *entelechy*, or *elan vital*. Probably many religious people followed this idea of *vitalism*, since it seemed to offer some room for God. The major difficulty was that such a life force was in principle considered not subject to investigation and therefore outside the scope of science.

It should be no surprise, therefore, that biologists were not particularly interested in forces they could not study, and the concept has fallen into disuse. Furthermore, the progress of biology has identified reasonable explanations for questions which the early vitalists insisted could be explained only by a vital force. In addition, it is my impression that vitalism is really foreign to a Christian doctrine of creation, even though it may superficially appear attractive. Does this exclude God? No, for our doctrine of creation must include the idea that all matter and energy spring from God and are held together by Him.

The vitalists did point up a problem, however. The explanation of the phenomena of life does require principles other than those currently available in physics and chemistry. George Gaylord Simpson has recently argued that biology is at the center of all science. "All known material processes and explanatory principles apply to organisms, while only a limited number of them apply to nonliving systems." (5, p. 87) The claim for the central role of biology may seem presumptuous, but the recognition of the complexity of living systems serves as an antidote to vitalism.

Simpson went on to identify three kinds or modes of explanation:

(a) The question "How?" — answered in terms of mechanism (reductionist explanation).

(b) The question "What for?" — answered by analysis of function (compositionist explanation).

(c) The question "How Come?" — answered by consideration of history (historical explanation).

The first of these kinds of explanation involves the use of physical and chemical principles. The significance of this mode of explanation is apparent to anyone familiar with current biological research. Several decades ago it was relatively easy to identify a biology laboratory by the presence of microscopes and the smell of formaldehyde. But today many biologists use the techniques and tools of the physical sciences. It is not possible to identify the nature of a research project by a cursory glance through the laboratory door.

One implication of this fact is that college students anticipating graduate work in biology must be well trained in physics, chemistry, and mathematics. Preparation for graduate work should be more broadly based and more rigorous along these lines than the program usually suggested for premedical students. Some of the significant advances in recent years have not been made by biologists at all, but by persons trained in such fields as physical chemistry.

Perhaps the most striking breakthrough has come in the discovery of the DNA code. I wish to review some of the major points in this development to illustrate the value of physical and chemical principles in biological explanations.

For some years now we have realized that the growth of organisms depends upon three essential factors: raw materials, energy, and information. This may be compared with the growth of a building, requiring building materials, energy in the form of men or machines, and information contained in the blueprints.

Studies with electron microscopes have revealed a very complex internal architecture within cells. Enzymes are localized in small structures or on their surfaces. Energy is stored in the form of compounds with high energy chemical bonds. The building blocks of proteins are available as amino acids — 20 different kinds in all. How does the cell know how to put these amino acids together in the proper arrangement to form the many different products needed by the cell?

From other lines of evidence, it became clear that the necessary information is stored in the nucleus of the cell, more specifically in the chromosomes. Chemical studies of chromosomes showed them to be composed of proteins associated with a special type of compound, DNA. It was just over 10 years ago (in 1953) that Watson and Crick postulated that DNA is in the form of a long molecule shaped much like a spiral

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staircase, with the stair treads made of pairs of chemical bases. There are only four possible kinds of stair treads, but they can be arranged in many different combinations or sequences up the staircase.

With this model in mind, teams of scientists have now "cracked the DNA code." Let us suppose that we walk up one side of the staircase and find that each step has one of four letters of the alphabet. The first three spell CAT, the next three TAG, and the next set TTT. It is obvious that we have a sort of code. It turns out that each three-letter word stands for one of the amino acids. We then can find out the sequence of amino acids specified by the code.

This DNA code, of course, is inside the nucleus while the work of the cell takes place out in the cytoplasm. Copies of the DNA code are made in the form of "messenger RNA." These copies are then free to migrate to the cytoplasm where they are lined up on ribosomes. Amino acids are moved into proper position by transfer compounds (also RNA) which can read the code. Finally, the amino acids are joined together in this order by the formation of chemical bonds (and in this process energy is used).

Here then is a physico-chemical explanation of a fundamental process in living matter. What are some of the implications?

(a) Once the amino acids have been lined up in the proper order, the molecules of protein automatically fold into the three-dimensional structure characteristic of that particular protein. In a favorite parlor riddle we are asked how long it would take a group of monkeys pecking away at typewriters to produce one of Shakespeare's sonnets. It might be possible to calculate the probability for a sonnet, but we will be way off when it comes to organic molecules. Who would have guessed that a complex-shaped protein molecule has a probability of one, given a linear sequence of amino acids?

(b) It now appears likely that a given 3-letter code stands for the same amino acid in all forms of life, from viruses to man. The idea of such a universal code staggers one's imagination.

(c) Many mutations have been traced to a change in just one of the letters in the code, making possible a new approach in the study of mutations.

(d) In many organisms enzymes are not formed until they are needed. This type of adaptation can now be explained. Many of the genes in a cell are kept inactive by repressors. When a chemical enters a cell and makes a specific enzyme necessary, this new chemical removes the brake (or derepresses the gene) so that messenger RNA is formed and the enzyme produced.

In these, and many other ways, we are learning to explore the complex biochemical pathways and feedback systems within cells. We are deeply indebted

to such explanations of the first type — answering the question "How?" in physico-chemical terms.

The success of molecular biology, however, is creating new tensions among biologists. Some argue that only this approach is true biology and that other methods are doomed to rapid extinction. Others strongly urge that many biological problems cannot possibly be studied by biochemical means, at least at present.

Therefore, let us turn to the second mode of explanation, which I have termed the analysis of function. Simpson would include here the adaptive usefulness of structures and processes, for the entire organism and for the species to which it belongs. Questions of ecological function would also be included.

By the end of the 19th century it had virtually become a dogma that a scientist must not ask "What for?" Such a question was considered meaningless or unanswerable in scientific terms.

The difficulty, however, is that "organisms are clearly adapted to live where and how they in fact live . . . In fact they plainly have the adaptations in order to live as they do. The question, then, is how these key words *in order to* are to be interpreted." (5, p. 86) These questions of purpose and purposiveness are included under the topic of teleology.

It has become traditional to insist that a scientist can have no truck with teleology, but this opinion conflicts with the statement of Mayr (3, p. 1503) that "no discussion of causality is complete which does not come to grips with the problem of teleology." And that of Simpson: (5, p. 86) "Many biologists threw out the baby with the bath water. In seeking to get rid of nonscientific teleology they decided to throw out all the quite real and scientific problems that teleology had attempted to solve."

One aspect of current thinking can be seen in the biologist's attitude toward structures for which no function is known. Formerly it was customary to dismiss such structures as "vestigial" — an historical explanation. It is now more common to say that the persistence of such an organ makes one suspect that it must have a function for the organism. There has been a recent breakthrough in study of the thymus, which is now known to be an essential for the formation of antibody-producing systems. The appendix in the rabbit is also essential for normal antibody-production. Early removal of the thymus in mice will prevent the development of leukemia.

How does one explain the actions of an animal that appear purposeful — a bird that starts its migration, an insect that selects its host plant, an animal that avoids a predator, a male that displays to a female? Mayr (3, pp. 1503-4) speaks of these as instances of "programmed behavior." This term makes more sense to us in this day of electronic computers. "The completely individualistic and yet also species-specific DNA code of every zygote (fertilized egg cell) . . .

is the *program* for the behavior computer of this individual." Because the term *teleology* has so many other implications, the term *teleonomic* has been proposed to describe systems operating on the basis of such a programmed code of information.

The third mode of explanation in biology is historical. It is not enough to understand the present mechanism and function of any biological system. One must also ask: How come? This question is usually inappropriate concerning strictly physical phenomena, but in biology it is both appropriate and necessary.

The use of radioactive tracers illustrates one type of historical reasoning. It is possible to analyze the contents of a cell and determine how much biochemical turnover there has been. For example, certain compounds in the fluid part of the eye show an almost complete exchange in 80 minutes. When radioactive techniques are applied to dividing cells, we learn that the DNA molecule replicates by splitting the staircase down the middle of the treads and forming new parts.

An awareness of future history is shown in our concern over the effects of radioactive fallout. We realize that extra mutations in our gonads will affect future generations — persons we may never see and won't have to like.

Turning to past history it is clear that natural selection has helped to determine the frequencies of different genes. Those gene patterns associated with a higher reproductive rate tend to become more common in the population. One of the best illustrations in man involves a type of hemoglobin called "sickle cell hemoglobin" or "Hemoglobin S." Persons with two genes for HbS have red blood cells that assume a sickle shape and result in a severe anemia. Few of these persons live to reproductive age. But sickle cell anemia in certain areas of Africa and the Mediterranean is too common for a disease with such a severe effect. Geneticists were puzzled until they found out that persons with only one gene for HbS were quite resistant to malaria. Thus the gene was favored by natural selection because of its advantage in carriers, even in spite of its harmful effect in those with a double dose of the gene.

A related problem is that of "final cause," which began with Aristotle's classification of causes. I must confess that I do not understand the implications of this concept. Mayr (3, p. 1503) quotes a definition of "final cause" as "the cause responsible for the orderly reaching of a preconceived ultimate goal." I suspect that this refers to a goal-seeking tendency built into the universe which has controlled its development from the beginning to the present order. This sounds like a type of deism rather than a Biblical concept of God as creator. The ideas of writers such as Lecomte du Nuoy have been described as a type of "finalism." There is a great temptation for a Christian to buy such an idea because it appears to explain purpose.

There may be a great danger that in defending the concept of "final cause" we may be defending Aristotle rather than God's Word.

We have thus considered the general nature of explanation and the three major patterns of explanation in biology. It is important to realize that many arguments about the "cause" of a phenomenon result when the opponents are talking about different aspects of causation.

One illustration is seen in the book *The Genesis Flood* by Whitcomb and Morris (6). The authors consider the question as to how the animals were brought to the ark and as to how they could be cared for. They then suggest that God may have introduced at that time the phenomena of migration and hibernation. A migratory instinct may have directed the animals to flee from their native habitats to the place of safety. Then having entered the Ark, they received from God the power to become more or less dormant, thus simplifying the problem of survival in the Ark.

For our discussion today, we must note that a major part of the authors' argument is that "thus far . . . science has been utterly unable to explain (these powers), in spite of their great importance in animal physiology and ecology . . . One might even be justified in saying that the marvelous migratory instinct and the equally remarkable power of hibernation can only be explained teleologically. We do not deny that some truly physiological explanation of these capacities may some day be developed, although none is in sight as yet, but even this would only constitute a description of that which God Himself originally endowed." (6, pp. 73-74)

It is interesting to compare this discussion with that by Mayr. (3, pp. 1502-3) To the question "What is the cause of bird migration?" Mayr lists four answers: (a) Ecological cause. An insect eater must migrate. (b) Genetic cause. The bird has acquired a genetic constitution which induces it to respond appropriately to the proper stimuli from the environment — an illustration of programmed or teleonomic behavior. A screech owl lacks this constitution and fails to migrate. (c) Intrinsic physiological cause — photoperiodicity. The bird is ready to migrate as soon as the number of hours of daylight have dropped below a certain level. (d) Extrinsic physiological causes — a sudden drop in temperature on the night of the 25th of August.

Morris and Whitcomb claim that there are no scientific explanations for migration, while Mayr thinks there are. Clearly they are talking about different things. Even if migration had been introduced by God at the time of the flood, we still want to know what genes are involved in transmitting the ability through all intervening generations, and how these genes act to bring about this unique pattern of response to environmental changes.

In my opinion, it is not necessary or wise to base an argument for God upon the absence of scientific explanation. Our belief in God as creator is based upon the Scriptures, not upon what science has, or has not, discovered.

But there is another side to the same point. Biologists have no business basing a denial of God upon the presence of scientific explanation. Unfortunately some prominent scientists have yielded to this temptation.

Mayr: "If an organism is well adapted, if it shows superior fitness, this is not due to any purpose of its ancestors or of an outside agency, such as 'Nature' or 'God' who created a superior design or plan." (3, p. 1504).

Huxley: "In the evolutionary pattern of thought there is no longer either need or room for the supernatural." (2, p. 252).

Simpson: "There has been disagreement and indeed confusion through the ages regarding to whom and for what man is responsible. The lower and higher superstitions have produced their several answers. In the post-Darwinian world another answer seems fairly clear: man is responsible to himself and for himself." (4, pp. 973-4).

In these statements our attention is turned toward the nature of man. It should be clear that the three modes of explanation do apply to man. In fact, a major part of my professional career is devoted toward understanding the biological explanations of man in terms of mechanism (physics and chemistry), function, and history. But I still hold that these do not fully describe man's nature. As a Christian, I hold to the affirmation that man was created with the ability to respond to God. I call this an *affirmation* since it is not based upon empirical data, but is an article of faith.

In summary, I have tried to point out that scientific explanations occur in layers and are never exhaustive. Explanations in biology may be grouped into three major categories. As a Christian I am committed to a Biblical view of creation, but not to vitalism or finalism. My faith does not rest on the presence or absence of scientific explanations. Realization of these essential points should clarify our witness to informed persons.

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PASCAL AND THE DILEMMA OF MODERN MAN

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This paper surveys the achievements and thoughts of the seventeenth century scientist and Christian, Blaise Pascal. Pascal possessed a strikingly modern scientific outlook and a positive Christian faith. He recognized that Christian insight can lead not only to a new relationship to God and one's fellow men, but also to a fuller comprehension of the natural world and man's place in it. The increase today of scientific knowledge has forced modern man to find his place in an infinite universe and to learn to regulate awesome power. He must further solve scientific problems which severely challenge routine approaches. Pascal foresaw these dilemmas and his approach to their solution has relevance today.

The world in 1962 was on the verge of nuclear destruction as two great nations threatened to use the negative fruits of modern scientific insight. This same year also marked the 300th anniversary of the death of Blaise Pascal, one of the earliest scientists to comprehend the place of man in the vast and awesome realm of nature as revealed by science.

For in fact what is man in nature? A Nothing in comparison with the Infinite, an All in comparison with the Nothing, a mean between nothing and everything. Since he is infinitely removed from comprehending the extremes, the end of things and their beginning are hopelessly hidden from him in an impenetrable secret; he is equally incapable of seeing the Nothing from which he was made, and the Infinite in which he is swallowed up. (I, p. 23)

Modern man indeed accepts such a world view and it has driven some to give up meeting personal responsibilities. Pascal found hope with which he could meet life without despair.

... I try to be just, true, sincere, and faithful to all men; I have a tender heart for those to whom God has more closely united me; and whether I am alone, or seen of men, I do all my actions in the sight of God, who must judge of them, and to whom I have consecrated them all.

These are my sentiments; and every day of my life I bless my Redeemer, who has implanted them in me, and who, of a man full of weakness, of miseries, of lust, of pride, and of ambition, has made a man free from all these evils by the power of His grace, to which all the glory of it is due, as of myself I have only misery and error. (I, p. 174)

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It is therefore appropriate that we examine the work and thought of the scientist, philosopher, but above all Christian, Blaise Pascal.

It is surprising to realize that the barometer we use to observe weather, the probability tables that regulate our life insurance, the computing machine used in business today, and the bus that takes us to work have all been originated or influenced greatly by the mind of one who lived a brief thirty-nine years. Pascal's contributions to science and pure mathematics are recognized as a sign of great intelligence and genius; but his contribution to public transportation reveals the full character of the man.

Pascal made a two-fold contribution to mass transportation. His scientific insight into the nature of fluid pressure enabled him to formulate the principle of the hydraulic brake used in cars today. On a broader level, he was one of the first Europeans to conceive of a company formed with the sole purpose of providing inexpensive mass transportation by having vehicles travel regular routes on a fixed time schedule. Pascal's motivation in forming this company reveals much, as he was looking for a way to raise money to provide for care of the less fortunate. Pascal saw himself as a servant of Jesus Christ and this relationship led him to apply his abilities to the service of those in need.

This concern for others led Pascal to help his fellow countrymen meet Jesus Christ who offered the one answer to man's basic problems:

The Christian religion, then, teaches men these two truths: that there is a God whom men can know, and that there is a corruption in their nature which renders them unworthy of Him. It is equally important to men to know both these points; and it is equally dangerous for man to know God without knowing his own wretchedness, and to know wretchedness without knowing the Redeemer who can free him from it . . . Jesus Christ is a God whom we approach without pride, and before whom we humble ourselves without despair . . . the God of Abraham, the God of Isaac, the God of Jacob, the God of Christians, is a God of love and of comfort, a God who fills the soul and heart of those whom He possesses, a God who makes them conscious of their inward wretchedness, and His infinite mercy, who unites Himself to their inmost soul, who fills it with humility and joy, with confidence and love, who renders them incapable of knowing any other end than Himself. (1, p. 181, p. 169, p. 182).

Pascal in his last brief years, spent most of his energies writing his "*Pensees*"—his thoughts on God, man, and their relationship. The task of making Christianity relevant to indifferent Frenchmen and of providing for the less fortunate were to occupy fully his last days; he quite willingly sacrificed his love of exploration of natural science in order to best serve his Saviour and Lord Jesus Christ.

VIEWS ON MAN AND THE WORLD

What unique contributions did Blaise Pascal make to an understanding of man and the natural world in the light of Biblical revelation?

Blaise Pascal was a very practical man. His view of the natural world shows a strong disdain of metaphysics to justify the world's existence. He was very much

aware of the capacity of the human mind to delude itself. "Self is hateful . . . In a word, the Self has two qualities: it is unjust in itself since it makes itself the center of everything; it is inconvenient to others since it would enslave them." (1, p. 151)

Pascal viewed the world as existing and directly observable; the world and observations of it were not things to be inferred from his existence. This contrasted with his rival in scientific achievement, Descartes. The world existed independent of the observer; the Self, a given human personality, need not exist before the world could be studied: "I feel that I might not have been; for the Ego consists in my thoughts. Therefore I, who think, would not have been, if my mother had been killed before I had life. I am not then a necessary being. In the same way I am not eternal or infinite. But I see plainly that there exists in nature a necessary Being, eternal and infinite." (1, p. 155)

As Pascal studied the natural world he saw that the observer was intimately related to what he was observing: "But the parts of the world are all so related and linked to one another, that I believe it is impossible to know one without the other and without the whole." (1, p. 26)

One cannot fully understand a given phenomena without understanding its environment and the very observer is part of the environment. Modern psychology and physics have testified to the dangers of assuming the scientist to be completely isolated from the conditions of the experiment. His very presence may markedly affect its results. (This is one way of viewing the uncertainty principle of modern physics.)

DOCTRINE OF ORDERS

Pascal saw arrangements, or hierarchies existing in the universe. Things were arranged in ascending orders, and the distinction between the orders was not merely quantitative, but qualitative. The study of mathematics led him to think in such a way.

If you have a magnitude of a certain order, you cannot increase it by adding any number whatever of magnitudes of a lesser order. Thus a line cannot be prolonged by adding points to it at either end however many points you add. A plane surface is not increased by laying lines along one edge, neither does a solid get any larger by surrounding it with a number of surfaces. (2, p. 203)

His observations on the relationship between the material universe and man, between man and man, and between man and God led him to develop the doctrine of the three orders.

The infinite distance between bodies and minds is an emblem of the infinitely more infinite, the supernatural distance between minds and charity . . .

The greatness of wisdom, which is nothing if not from God, is invisible to the world and to men of intellect. These are three orders, different in kind.

Great geniuses have their empire, their glory, their greatness, their victory, their splendour, and have no need of worldly witnesses with which they have nothing in common. They are seen not by the eyes but by the mind; it suffices.

The saints have their empire, their glory, their victory, their splendour, and have no need of worldly or intellectual dis-

tinctions, with which they have nothing in common, and which can neither increase nor diminish them. They are seen by God and the angels, not by bodies or by curious minds; God suffices them . . .

Jesus Christ, without wealth and without any external display of knowledge, is in His own order, that of sanctity. He gave the world no invention; He did not reign; but He has been humble, patient, holy, holy towards God, terrible to demons, without any sin. Oh! the pomp, the prodigal magnificence of His appearance to the eyes of the heart, which see wisdom! . . .

All bodies, the firmaments, the stars, the earth and its kingdoms are not equal to the smallest gleam of intelligence: for it knows them and itself and they know nothing.

All bodies together, and all minds together; and all their products, are not equal to the slightest stirring of charity. That is of an order infinitely more exalted.

From all bodies together we cannot obtain one little thought; that is impossible and of another order. From all bodies together, and from all minds together we cannot devise one movement of true charity. That is impossible, of another order, supernatural. (2, p. 205-206)

It should be noted that Pascal developed his theory of orders in such a way that the various orders were clearly separate, and yet, by another quality, linked together. As we have stated before, no amount of magnitude in a lower order could amplify a higher order, yet he found one law prevailing throughout all experience: "Nature imitates herself. A seed thrown in good ground brings forth fruit. A principle, instilled into a good mind, brings forth fruit. Numbers imitate space, which is of a different nature. All is made by the same master, root, branches, and fruits; principles and consequences.

"Nature diversifies and imitates . . .

"Nature always begins the same things again, the years, the days, the hours, in like manner space and numbers follow each other from beginning to end. Thus is made a kind of infinity and eternity. Not that anything in all this is infinite and eternal, but these finite realities are infinitely multiplied. Thus it seems to me to be only the number which multiplies them that is infinite." (1, p. 45)

RELIGIOUS AND SCIENTIFIC AUTHORITY

Pascal saw clearly that the Order of Charity may reveal itself in quite different ways from that of the realm of physical phenomena. Such views were in conflict with the church's position of the day yet were necessary for science to make progress. Pascal had been long interested in the nature of a vacuum. His famous series of experiments on fluid pressure led to an understanding of barometric pressure and more specifically hydrostatics which was contrary to the prevalent views of Aristotle's philosophy. The church believed that authority and tradition were as applicable in the newly expanding science as in theology. Pascal, who firmly accepted Biblical authority as the key to religious understanding, felt just as strongly that experimentation was essential to the development of science. His letter to P re Noel, a Jesuit scientist, concerning the vacuum controversy clearly states Pascal's understanding of scientific method.

One should never form a decisive judgment for or against a proposition unless one can affirm or deny that it satisfies one of two conditions, namely:

Either, that it presents itself so clearly and distinctly to the sense or to the reason (according as it is the subject of one or the other) that the mind has no means of doubting its certainty—and we should then call it a principle or an axiom. Or, that it is deducible as an infallible and necessary consequence from such principles or axioms.

Whatever satisfies one of these two conditions is certain and true. Whatever satisfies neither of them should be regarded as doubtful and uncertain. (2, p. 80)

Significantly we see that Pascal appealed both to inductive examination of the real world as later advocated by Bacon, and to Descartes's use of deductive reasoning from known premises.

LIMITATIONS OF HIS DOCTRINE OF ORDERS

What weaknesses may exist in Pascal's view of the world? To say that an idea is a different sort of entity than say, a loaf of bread may not lead to productive achievement. Indeed, there are religious cults which worship abstract principles to the extent that the needs of the body for bread are ignored. To recognize differences in life does not mean that areas of life can be forgotten. It is also possible to recognize differences, not ignore them, and yet very neatly compartmentalize them. There are too many people (including ourselves sometimes) whose experience with the kingdom of God is confined to church activity; it ends the minute we enter the laboratory or have lunch with our business associates. The history of shortsightedness on the part of both Christians and scientists toward evolution and Biblical revelation has led to much bitterness. Sincere Christians, recognizing that love was desperately needed to replace controversy, have treated Genesis one and two as an allegory depicting God's creation process, whereas science tells us the details of the actual historical process. Such an approach represents compartmentalization. A very real difficulty evolves when the question is asked, "Where does allegory in Genesis end and real history begin? Pascal, himself, isolated the methods and world of the laboratory from Biblical records and authority. The one issue of Pascal's time which would have tested his separation of scientific and Biblical authority was the new astronomy of Copernicus and Galileo. (The earth revolves around the sun.) No appreciable record has been left of Pascal's thoughts on this matter.

STRENGTHS OF PASCAL'S VIEW OF THE WORLD

What strength and truth does Pascal's view of the world possess? He said that one law prevails in all order of endeavor: "Nature imitates herself." Science has found such a view of nature to be particularly fruitful in predicting new physical phenomena and explaining known observations. As an example, the phenomena of resonance, a large motion occurring at a certain rate of vibration, has been found not only to occur in the large oscillations of bridges due to winds, but also in the oscillations of electrical circuits, and even in the oscillatory motion of sub-atomic particles. Scientists have found that resonance explains the rather startling behavior of quite different physical systems.

Pascal secondly states that the hierarchy of orders is ascending and finally transcending. The realm of intellect is above that of matter; the possibilities of arrangement and subtilty of thought are infinitely more varied than that of matter. Further, the realm of intellect can comprehend and regulate the world of matter. But the order of charity transcends all—it is above nature. Man can state as a principle that he will love his enemy, yet to maintain such an ideal a greater strength is needed. True self-giving human love, weak as it may be, is infiltrated with the presence of a realm beyond nature. Jesus Christ, the Son of God, has revealed that the character of God, the Father and Creator of men, is love and He suffered the torment of sharing human sin in order to restore our fellowship with Godly love. The order of charity is Pascal's unique way of restating the Biblical themes of God's love and righteousness, the kingdom of God, the seeking of that which is eternal.

REASON AND CHRISTIAN FAITH

Today, modern science says that human reason is all sufficient, whereas modern existentialism finds such rationalism cold and unfeeling. However, many existentialists have created a world just as cold, a world empty of all meaning. One could further view the history of the confrontation of Christianity and science as a conflict between reason and subjective authority with the balance of power swinging violently to and fro. Pascal's views on the relationship between reason and Christian understanding may be helpful in approaching a problem of very long standing, yet ever present concern.

Pascal had a very high view of human thought.

I can well conceive a man without hands, feet, head (for it is only experience which teaches us that the head is more necessary than feet). But I cannot conceive man without thought; he would be a stone or brute.

A thinking reed. It is not from space that I must seek my dignity but from the government of my thought. I shall have no more if I possess worlds. By space the universe encompasses and swallows me up like an atom; by thought I comprehend the world. (1, p. 115, 116)

Yet as Pascal's great *Pensee* on natural and supernatural Orders indicates, there is a realm of existence which human reason cannot first penetrate but which must be made known by God. In this *Pensee* Pascal thought of the material world as a basis for studying the whole of existence, yet by itself completely removed from the realm of thought. But there is a further realm of truth which a reasoning intellect, by itself, cannot comprehend. Such truths are not grasped by analytic reasoning, for this realm of charity is as removed from pure intellect as intellect is removed from material things. Pascal uses the term heart to describe the faculty by which man comprehends this order of charity.

The heart has its reasons, which reason does not know. We feel it in a thousand things. I say that the heart naturally loves the universal Being, and also itself naturally, accordingly as it gives itself to them; and it hardens itself against one or the other at its will. You have rejected the one and kept the other. Is it by reason that you love yourself?

It is the heart which experiences God and not the reason. This, then, is faith; God felt by the heart, not by reason.

Faith is a gift of God; do not believe that we said it was a gift of reasoning. Other religions do not say this of their faith. They only give reasoning in order to arrive at it, and yet it does not bring them to it.

The heart has its own order; the intellect has its own, which is by principle and demonstration. The heart has another. We do not prove that we ought to be loved by enumerating in order the courses of love; that would be ridiculous. Jesus Christ and Saint Paul employ the rule of love, not of intellect; for they would warm, not instruct. (1, p. 95-97)

We thus see that Pascal believed that God gave the faculty of knowing Him to all men and man can freely reject this faculty. If man is to use this faculty he must realize it means commitment to God as one commits oneself to a loved one. Mere intellectual knowledge of God is sterile. God's order requires of man and gives to man much more than knowledge. God's order deals with redemption, love, and friendship which are personal, not abstract qualities.

"The knowledge of God is very far from the love of Him." (1, p. 95) In a very real sense purely intellectual inquiry gives an incomplete picture of God, for to know God you must experience a person not a thing.

Pascal further states that this faculty of recognizing God's action, the heart, can even be used in examining the natural world.

We know truth, not only by the reason, but also by the heart, and it is this last way we know first principles; and reason which has no part in it, tries in vain to impugn them . . . For the knowledge of first principles as space, time, motion, number is as sure as any of those which we get from reasoning. And reason must trust these institutions of the heart, and must base them on every argument. (We have intuitive knowledge of the tridimensional nature of space, and of the infinity of number, and reason then shows that there are not two square numbers one of which is double of the other. Principles are intuited, propositions are inferred, all with certainty, though in different ways.) (1, p. 95-96)

CREATIVITY AND KNOWLEDGE

For Pascal to comprehend the natural world, more than analysis is needed—we must start from first principles, and to perceive such principles, man's creative intuition must be utilized. But what is this creative intuition? If we are Christians we believe that God is creator and governs all that exists. Is it not natural then to observe as Pascal, that the very faculty of man which enables him to know and to respond to God can also perceive and comprehend God's structuring of the universe?

Facts by themselves are humdrum. To state that carbon has four electrons which can share in covalent bonding by itself is a sterile statement. But if one recognizes that the compounds which thus can be formed make organic life possible, then the fact of carbon's covalent bonding becomes alive. To fully have truth one must have facts and yet more; true perception requires more than abstract analysis, it requires our personality. Pascal has said, "The heart has its reasons, which reason does not know." (1, p. 95) Abstract analysis by itself is incomplete—we know far more than reason by itself conveys. Science itself

has made real progress when scientists have allowed their entire creative personality to interpret and predict the behavior of the natural world. P.A.M. Dirac makes the following observations concerning Schrödinger's development of the wave equation which has altered modern physics. "I think that there is a moral to this story, namely that it is more important to have beauty in one's equations than to have them fit existing experiment . . . It seems that if one is working from the point of view of getting beauty in one's equations, and if one has a sound insight, one is on a sure line of progress. If there is not complete agreement between the results of one's work and experiment, one should not allow oneself to be too discouraged, because the discrepancy may well be due to minor features that are not properly taken into account and that will get cleared up with further developments of the theory." (3, p. 47) Pascal could well agree that one's esthetic sense may play a real role in understanding the physical universe.

PASCAL AND OUR PRESENT WORLD

1962, the 300th memorial of Blaise Pascal, marked a year of domestic and international turbulence capped by the threat of nuclear holocaust. People of all races, faiths and political commitments were and are working to end the threat of armed conflict with motivations ranging from compassion to self survival. Scientists as a working premise attempt impartially to seek truth; the democratic way in which their scientific societies function indicates it is possible to work together peacefully. New scientific discoveries show promise of conquering poverty, hunger, and over-population—all important causes of political tensions. But the portrait modern science presents of man standing between microcosm and macrocosm must also be faced, for its reality humbles the intellect. Intelligent modern man, even in environments where material prosperity and absence of external pressure exist, still shows antagonism to others. To truly seek peace on all levels of experience more than intellect is required; contact must be made with a realm where charity toward all exists, a realm ruled by the supernatural love of God. Modern man longs for contact with this "order of charity." As Pascal observed concerning all men, "There is a God-shaped vacuum in the heart of every man which cannot be satisfied by any created thing but only by God, the Creator, made known through Jesus Christ." (4, p. 8)

As Christians and scientists we must face the responsibility that comes with increased insight into the nature of God, man, and the world. We must work for domestic and world peace in the predominantly scientific culture of today. We must further recognize the need of eliminating the apparent negating effect of scientific humanism upon Biblical revelation which points toward the only source of true peace.

Pascal has become today a controversial figure. While some appreciate his scientific mind and Christian contributions, others criticize him for, among other things, devoting his last years to theology rather than

to scientific pursuits. Nevertheless, all who are united in the true fellowship of Jesus Christ can well profit from study of the life and thought of this seventeenth century Christian layman. Pascal contributed uniquely to the development of scientific thought while maintaining a reverence, respect, and love for Biblical authority and above all, a personal relationship with Jesus Christ. Christians, called to be lights to the world, have a God-given responsibility to care for the world's ills. In this task we can well pray as Pascal once did: "Let us do little things as though they were great, because of the majesty of Jesus Christ who does them in us, and who lives our life; and do the greatest things as though they were little and easy, because of His omnipotence." (1, p. 178)

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REFLECTIONS ON PASCAL

Pascal has much to say to moderns who are grappling with the problems of a scientific culture that has lost contact with God. His assertion of the inadequacies of scientific methodology and the existence of a higher order of reality is as relevant today as it ever was. His example of piety, humility and Biblical priority in spite of unquestioned scientific genius is a challenge to Christians with scientific aspirations.

However, Pascal proves to be somewhat disappointing in his failure to provide adequate explanation or encouragement of how science can be a Christian calling. His renunciation of scientific activity during the last few years of his short life was only interrupted during periods of illness when he solved mathematical problems as a distraction from pain. Much of his thinking seems to suggest a dichotomy between science and Christianity that is disturbing in the light of the teaching of such of his spiritual ancestors as St. Augustine. His divorce of reason and intuition suggests to some an easy transition to skepticism. Perhaps the greatest value of Pascal's ideas is their shock effect in forcing men to a re-evaluation of basic assumptions and narrow viewpoints and a consideration of Christian truth as a valid option.

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THEORIES OF ETIOLOGY OF SEXUAL INVERSION

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In this timely article are examined several of the more prominent theories which attempt to explain the etiology of homosexuality. It underscores the inadequacy of the somatogenic theories, i.e., those finding causes primarily in physiological or genetic factors, as well as those theories purporting to find some single cause for the condition. It prefers those psychogenic theories which ascribe the origin of homosexuality to the failure to accomplish certain critical learnings during the several phases of development. On this basis it is maintained that homosexuality should be seen as a symptom and not a cause, in particular a symptom which arises from a considerable narcissistic framework.

There are few topics which, when up for discussion, create more heat and scorn and less light than that of homosexuality (sexual inversion). The naive, unconcern and rejection of the general public is astounding, and little does it realize that there are thousands of men and women in society who spend much time and energy in combating or fulfilling such deviant sexual behavior—energy which would be of great value if used in socially constructive channels. However, it is not our direct purpose to attempt a reform of the inadequacies of society by exhortation, but, rather, to make explicit the origins of this sexual orientation. It must be kept in mind that the vast number of

statements are theories of causation and do not represent studies of proof¹. In any case a general pattern can be discerned and most theories fall under either a somatogenic or psychogenic classification. Those in the latter group are further subdivided into theories which blame society, those which base the cause on one particular experience or stage of life, and those which look for the genesis in a series of developmental crises.

The first school of theory with which we shall deal is that of the somatogenic bias. One group says that sexual inversion is genetically determined and studies of siblings and fraternal twins are cited as evidence. Similarity of some homosexuals to feminine body types is given as further proof and an intersexual type has been hypothesized. However, none of these theories take into account the great diversity of body types and temperaments among the sexually inverted. Nor do they adequately meet the criticism that perhaps similar home environments among siblings could lead to the same deviation.

Another branch of the somatogenic theory is that which regards endocrinological factors as decisive—that is, there is an androgen-estrogen imbalance. Some studies seem to support this but counter research has shown that endocrine injection treatment rarely helps the condition nor does castration change one into an homosexual. The idea that this deviation is a disease caused by excessive masturbation, somatic disease in the parents, a female soul in a male body, or a female brain with male sex organs is also discredited and thus we must look beyond the somatogenic hypothesis.

And so we turn to the psychogenic alternative as an explanation and the following statement by Edrita Fried seems an adequate introduction:

Homosexuality is a human rather than primarily sexual disorder. It is the outgrowth of failings in human relationships. A childlike self-image is responsible as much as are physiological and specifically sexual desires that have remained arrested or appear in imbalance. If attention is directed primarily to the emotional and mental problems of the homosexual and the homosexuality is regarded as a symptom that will disappear after the personality has been put on a sounder basis, it is possible to achieve a good percentage of cures.²

This distinction that the homosexuality is a symptom and not a cause, giving rise to the idea that deeper neurotic problems exist, is an important one and is held by most theorists who subscribe to the psychogenic view.

This stream of thought states that homosexuality is acquired and we may well ask, "Acquired from whom?" The first answer which we found was: "society at large." Primary in this group is Robert Lindner who states that homosexuality is "a pattern of sex orientation adopted by certain individuals as their solution to the conflict between the urgency of the sexual instincts and their repressive efforts brought to bear upon sexual expression by the reigning sex morality."³ To him,

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homosexuality represents a rebellion, a refusal or inability to conform to a fundamentally "antibiological" sex morality. Others feel that men are driven to seek male company because of the threat which the aggressive American female represents.⁴ Puritanical morals, unrealistic ideals of manliness (which cause a fear of failure and hence a flight from achieving maleness), faulty sex education as well as seduction experiences may be blamed. The real criticism of this thesis is: why aren't the majority of men "converted" to homosexuality? On the validity of this question we must turn elsewhere.

Again: "from whom is a homosexual orientation acquired?" Our answer now: "from parents, especially mama." In this context we shall first take a look at the Freudian model. From psychoanalytic research, Freud theorized that the mechanism involved was as follows: during childhood the boy has a short but intense fixation to women, usually his mother. If she is particularly over-involved in the child's life, he may identify with her. At first he may take himself as the love object, but soon the child looks for a man who resembles himself whom he may love as his mother loved him. This compulsive longing for men and ceaseless flight from women is the mechanism repeated throughout the invert's entire life. After puberty other factors such as social isolation, lack of one parent or frustration of the heterosexual aim may further the deviation. In any case, the Oedipal period is not resolved and the boy sees himself as a substitute for the mother or the father is converted into a female as the object of the boy's sexuality.⁵ Where father remains a male, we may postulate a somewhat passive but dominating mother and an aggressive and demanding father. In the other case, father may be passive and retiring, while mother is aggressive and demanding. From this brief summary of Freudian thought we can see that this is thought of as basically a problem of faulty identification with parents of both sexes.⁶

Many other theorists substantially agree with Freud that identification with the mother due to an over possessive love may be the nuclear process. They have shown that an aggressive, overprotective, seductive mother coupled with the lack of a father creates optimum conditions for inversion; however, it must be remembered that this is not a necessary result.⁶ Morse states that alienation from the mother because of her failure in some area vital to the child accompanied by an extremely strong association with the father may be a causative factor in that the son develops such a strong attachment that he transfers his developing sex impulse and attachment to other men like his father.⁷ In all the cases above we see that inversion is a "product of distorted emotions associated with a parent."⁸

Other parental attitudes may also lead to a sexually deviant object choice. If the parents were disappoint-

ed in the sex of the child or are disappointed in their own sex roles as well as experiencing poor marital relations, proper conditions for inversion may be created. Parents who tie strong moral and ethical ideas to the sex drive, instill the idea that heterosexual contacts are dirty or painful, and create fear of the loss of parental affection as punishment for infantile sexuality or masturbation may lead to inhibitions and a renunciation of the appropriate sex role. Parental ridicule of a child's sex role or injection of the idea that maleness equals badness puts great negative loading on the heterosexual role. Great overemphasis on manliness in which a man is to be completely dominant, aggressive and never gives in or shows emotion (the homosexual is considered more manly because he doesn't give into a woman⁹) in addition to extraordinary weighting on the acquiring of success may cause further inhibitions in the sexual realm and generate a lack of confidence and drop in self esteem. Failure is equated with femaleness and Ovesey has postulated this equation: "I am a failure = I am castrated = I am not a man = I am a woman = I am a homosexual."¹⁰

Closely associated with the child-parental relationship and yet somewhat more of a developmental problem is that of the narcissism mechanism. Edrita Fried spends a great deal of time explaining this particular phenomenon and describes homosexuals as "victims of their own narcissistic confinement."¹¹ She cites the two stages of narcissistic development. The first stage directly follows birth in which time the child is in relative isolation and has all his wants cared for. If not outgrown, the person wants his environment to "reiterate but not to react" to him and he can relate best to another person or group that is as nearly like him as possible, a "re-edition" of himself.¹² In the second stage of narcissistic leaning the child achieves awareness of others but tries hard to make himself lovable. In a real sense he is bound to or dependent upon the approval of others and tries to get love from others like him because he considers himself as basically lovable and can love only those like him.¹³ Dr. Fried emphasizes the unrealistic self sense—feelings of being a child—along with the unrealistic body image of inverts. The person cannot tolerate dissimilarities in other people as they don't have the capacity to perceive and enjoy in others that which is different from themselves. When disharmonies do occur, he reacts violently and anxiety is the result. The invert may put on a show of bravado and an external facade of arrogance and ingratiating manners in order to get along with members of the opposite sex but basically there is much anxiety and tension present. Homosexuality is seen as a problem solving technique—to overcome the tension and anxiety created by normal sexual encounters, to cope with the lack of emotional and mental strength.

Other theories of H. Cleckley as well as of M. Boss center on the phenomenon of love and are much less

precise as are our final set of theories which do not explicitly blame one factor for the cause of inversion but look to a cluster of factors which through different stages in development create an appropriate environment out of which a deviant form of sexual behavior, may arise. Sullivan emphasizes the factor of social interaction. In the preadolescent period or time of intimacy, he has found that inverts usually had been in the "out group"; due to high intelligence, disasters of maturity timing (too early or too late—perhaps due to endocrine factors) this youngster participated very little in activities with his peers and the greatly needed intimacy of this chum age was not realized. When he does need a chum, the youth may then form a relationship with a person who is much younger or with an adolescent person and this can lead to serious personality risk. In the adolescent period the occasional youth may turn inward to his reverie due to some inability to socialize with others (fear, physical unattractiveness, geographical isolation) and may never outgrow or change the preadolescent direction of the need for intimacy—maturation of lust dynamism but no change in object. Through reverie processes, excessive masturbation, pseudoheterosexual practices he handles his genital drive.¹⁴

Erik Erikson's theory agrees in many respects with Sullivan in that he too has growth divided into several stages or critical learnings in the development of the mature self. When a person fails to acquire this key attitude, progress is slowed or halted, the life space is narrowed, and seeds of behavior disorder begin to germinate—including deviant sexual behavior. The child moves through the stage of trust versus mistrust to that of autonomy versus dependence. If autonomy is denied, the child may turn inward in order to manipulate his environment and seeds for isolation are planted. The third stage (initiative versus guilt) has its dangers due to the fact that a sense of guilt may be associated with finding out what kind of a person he is—impulses and identifications. If unsuccessful in the fourth stage (industry versus inferiority), the ego suffers, he may abandon hope of achievement in certain areas and is led into isolation and inability to identify with others—especially the fierce normal identification with members of the same sex which begins the role determination. During the fifth stage (identity versus role diffusion) physical and genital maturity is reached and role diffusion, especially strong doubts as to one's sexual identity and a differentiation made between sex and the rest of the personality, is ground for important deviations in behavior patterns. If the need for intimacy with the members of the same sex is postponed until the time when strong sex needs are especially prevalent, identification of the love sense and sex feelings can be made synonymous and homosexuality can result. In the sixth stage when intimacy and isolation are even more acute, there is a great call for ego and body mastery in order to face fear of ego loss in situations which call for self abandon (close friendships, orgasm, etc.). Where

there is not sufficient strength to meet these, especially in heterosexual channels, one may remain continually with "the boys" and develop strong homosexual inclinations.¹⁵ In both Sullivan and Erikson all these factors and stages contribute to final deviant sexual behavior. A good deal of latitude is allowed and we must remember that each person should be treated as an individual and seldom is one factor alone to blame for his particular problem. This is what these last theories have to offer us—a more realistic approach in light of the basic individuality of each person.

We much prefer the latter, more dynamic view of the etiology of sexual inversion but much research needs to be done in order to know where truth really resides. The problem is a pressing one due to the number of people bothered by this particular pathology and society can ill afford to allow them to tie up so much of their time and talent in coping with such a life pattern. The need for a climate in which research on homosexuality can be carried out and in which young people dare seek help while still young and thus better their chances for recovery is, indeed, urgent.

FOOTNOTES

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A MEDITATION ON ANALOGIES

FLOYD RAWLINGS

Comparisons between the performance of a physical experiment by someone seeking scientific realities and the performance of a spiritual experiment by someone seeking religious realities are made. Both are established on assumptions (beliefs) made by faith; both soon find themselves facing principles of impotence and unfathomable mystery; both are ultimately seeking truth; both are judged successful on the basis of new relationships revealed and fruitful benefits to the experimenter and his world.

In performing a scientific experiment the first necessary requirement is the establishment and acceptance of the basic assumptions upon which the "scientific question" will rest. These assumptions are often unexpressed but critical and are a matter of scientific faith. For example, one such assumption which is common to all experiments is the faith that this physical universe is one of law and order. If this were not true, science as we know it could not exist.

I like to feel that my relationship to the spiritual universe can be derived from a spiritual experiment. So, as a matter of spiritual faith I accept and establish two basic assumptions: first, God is, and, second, that somehow this God is directly and entirely responsible for the physical universe of which I am a part.

The second necessary requirement in performing a scientific experiment as a part of what we call scientific research is to consider all the sources of data which have some bearing on the problem at hand. Life is too short for any scientist to duplicate again all the work that has already been done previously. For example, one source of data would be the scientific journals, such as the "Journal of the American Chemical Society".

Just so, in my spiritual experiment I must consider the sources of data at my disposal. In my investigation I find three:

- a) God's revelation in nature.
- b) God's revelation to men in the writings of men.
- c) God's revelation in the Person, Jesus Christ.

From the first source which provides the material of man's science, man has created comfort, leisure, a greater abundance of his necessities, the beauty of music and art, the power to build and the power to control his environment. Also in this source I see more beauty than ugliness, more power than weakness,

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more complexity than simplicity, more intelligence than stupidity and more order than chaos. But in addition I soon discover unfathomable mystery: things such as matter and energy (mattergy), force, gravity, space and time (space-time), etc. which can only be described in terms of something else or by what they can do; things such as the immensity of 1.5 million light years (6 billion billion miles) to the galaxy in the constellation Andromeda or the minuteness of a 100 million atoms to an inch, which I can not comprehend. This gives me a picture of God with infinite intelligence and infinite power as compared to finite man, but a God Who has given man the ability to understand His creation, His laws and His order as a reward for intensely hard work.

In searching the second source I find the greatest beauty, the truest picture of myself and the greatest number of helpful and profound truths in the book called the Holy Bible. This revelation of God tells me in John 4:24 that God is a Spirit and in Genesis 1:1 that in the beginning God created the physical universe including this earth. So, having no mechanical or anthropological picture of God, I soon discover unfathomable mystery: things such as grace, divine love, sanctification, atonement, etc. which can only be described in terms of something else or by what they can do; things such as God as Spirit and God the Creator as the source of all matter and energy, space and time, etc., which I cannot comprehend. Therefore, as I look at this picture of God and of a changing universe which more and more seems to have a definite beginning, to be expanding, perhaps, and to move forward by cause and effect, I find these revelations too large or too minute, too vague and too impersonal.

So when I think of God I find myself irresistibly drawn to the third source of data, the Son of God, Jesus the Christ, Who had to perfection the characteristics of goodness, purity, holiness and righteousness. In Christ I see a God Who is redemptive, bringing a Way of Life, bringing the Way of salvation through His death on a cross and sending a Comforter, the Holy Spirit. My final picture of God is seen here in the Resurrection of Christ and His promised return, for here is the God of infinite divine love and perfect justice—the Heavenly Father Whose goal for man is to give us gloriously abundant living here and now, followed by an eternity with Him in the spiritual universe.

After the acceptance of the assumptions and the search of the literature comes the experiment itself, the collection of scientific data as facts in a laboratory under controlled conditions. From these data the scientist attempts to discover new truth about the physical universe, to discover new laws or to create new theories. As a result he can correlate scattered data from numerous other experiments into a unified pattern for the whole universe, control the environment to his advantage and predict future events without further laboratory experiment. If the experiment

is a good one, he ultimately accomplishes one or more of these goals to the benefit of himself and society.

In like manner after the acceptance of my spiritual assumptions and the search of the sources of data comes the spiritual experiment itself, in the laboratory of life, to see if it works. Realizing I am nothing without God but have everything good “in Christ”, I surrender my life, my ambitions, my desires and my future to Him and take Jesus Christ as the Lord of my life and the Savior of my soul. From these data I discover new truth about the spiritual universe, discover spiritual laws and thrill to the new relationships between myself and God, between myself and other human beings and between myself and society. As a result I can correlate scattered data from all phases of life, from prophecy and from contemporary history into a unified picture of God’s plan and purpose for the human race; I can control through the power of the Holy Spirit my body, my thoughts and my actions as I grow towards perfection to God’s glory, not mine; I can predict a future of heavenly joy and peace beginning now and continuing after death at the feet of Christ in a spiritual universe which exists. The experiment is a good one for I have accomplished all of these goals, and more, to the benefit of myself and society.

“Therefore, if anyone is in Christ, he is a new creation we beseech you on behalf of Christ, be reconciled to God so that in Him we might become the righteousness of God.” II Corinthians 5:17,20,21.

LEARNING, SCIENCE, AND FAITH

The center of the Great Commission is a call to “make disciples of all nations.” Yet the depth and scope of the discipleship are dependent upon the disciple, whose first credential is that he is a learner.

. . . Why did Jesus not choose the so-called scholars of His time to be His disciples? Could it be that many of the religious intellectuals of His day thought that they had all the answers? No one unwilling to be a learner could matriculate in this university.

. . . The learner may have intellectual doubts and questions, but Christ invites him, as He did Thomas, to come along. Although Thomas was baffled by many things, he did not wait until he had all the answers to his doubts before he trusted. And because he trust-

ed, there came a day when he could say, "My Lord and my God." . . . the evidence comes through the venture. . . . This is the basic error of the skeptic, not that he questions or doubts, but that by his skepticism he closes the door to the venture. We learn as we trust. "We walk by faith and not by sight," said Paul.

We live at a time when there is increasing emphasis on what men learn by the scientific process. To be sure, God has made an ordered universe which demands our rational and ordered response. But the God in whom the disciple trusts is not confined to a scientific formula. He is revealed in Christ as Redeemer, who saves the disciple from his sinful, selfish nature, from the horrible pit of self-gratification. He is revealed in Christ as Lord who summons followers.—*Dr. Gordon R. Lahrson*, European Representative of The American Baptist Foreign Mission Societies, in *The Torch*, vol. 4, no. 4, pp. 1-3, July 1963. Reprinted by permission.

EDITORIAL

THE CASE FOR SCIENTIFIC EXCELLENCE

Long ago, Paul admonished Christians to ". . . walk worthy of the vocation wherewith ye are called" (Ephesians 4:1). Today, as then, the same exhortation stands. We, as scientists, are called to our professions. "The way of man is not in himself, it is not in man that walketh to direct his steps" (Jeremiah 10:23). Since we are appointed by the Lord Jesus Christ Himself, we must respond with dedication and devotion to our Savior, excellence in our performance toward our vocation, and sincerity, understanding and genuineness toward our fellow men.

In whatever position or situation we find ourselves, our BEST is demanded. As Christians in science, we cannot afford to be second-rate or slipshod in our attitude or behavior. Too often, Christians forget that they belong to the greatest and most glorious family in the universe. A friend told me a story about the present Queen Elizabeth as a child. Elizabeth had lost her way and stopped at a cottage to ask for directions. The lady of the house asked who she was. Elizabeth replied, "I am nobody, but my father is the king." We must remember that we are of royal blood, and

everything we say and do reflects the King. Thus, we must lean wholly on our Lord, and not depend on ourselves or our intelligence. We must get our signals from the Master. As Proverbs 3:5,6 says, "Trust in the Lord with all thine heart; and lean not unto thine own understanding. In all thy ways acknowledge Him, and He shall direct thy paths." And Psalm 37:5—"Commit thy way unto the Lord; trust also in Him; and He shall bring it to pass." Our lives either reflect the Son or the world. Therefore, our actions and deeds cannot be mediocre; our performance cannot be commonplace. We represent the King. Not everyone is given the intelligence of a genius, but everyone is given a share of talents. We must make use of what He has given us and multiply it to His glory (Luke 19:12-26). "To whom much is given, much is required" (Luke 12:48). In other words, excellence—excellence in loyalty, excellence in duty, excellence in performance. This excellence is not only expected in our Christian attitude, but in our scientific pursuits. An acquaintance told me of the disappointing experience when faced with dismissal from professional school because of scholastic failure. He realized that he had not given it his all. Later he approached a Christian professor there but found no sympathy or encouragement. The professor said that a Christian does not have the right to be mediocre. In fact, there must not be a mediocre Christian. When a child of God fails to do his best in the position Christ has appointed him, the failure reflects on the entire royal family. We are denying Christ by our failure. The verse is still true that "If any of you lack wisdom, let him ask of God that giveth to all men liberally, and upbraideth not; and it shall be given him" (James 1:5) and (I John 5:14,15) "This is the confidence that we have in Him, that, if we ask anything according to His will, He heareth us; and if we know that He hear us, whatsoever we ask, we know that we have the petitions that we desired of Him."

A person must count the cost of being a Christian and pay the price. Some find the price too high. But they are missing the greatest privilege in being a child of the living God. What a wonderful assurance it is to have sins forgiven and eternal life promised. "Whatsoever is born of God overcometh the world; and this is the victory that overcometh the world, even our faith. Who is he that overcometh the world, but he that believeth that Jesus is the Son of God?" (I John 5:4,5) Therefore, no disappointment, fear, trial, or problem should sway us. What confidence we have in Him—to know that He will never leave us nor forsake us (Hebrews 13:5). We cannot be mediocre for Christ, when He gave His ALL for us. As witnesses (Isaiah 43:10), ambassadors (II Cor. 5:20), sons and heirs of the living God (Gal. 4:5 and 7), we can do no less than the best. "Whatsoever ye do, do it heartily, as to the Lord, and not to men" (Col. 3:23).

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FROM THE CONTRIBUTING EDITORS

ARCHAEOLOGICAL NEWS FROM ISRAEL

JERUSALEM, ISRAEL—Many secrets of antiquity have been uncovered by the archaeologists' spade during 1963-64. New light has been shed on various aspects of Biblical history.

NEW TESTAMENT

Masada. The longest continuous season of excavation ever carried out in Israel came to an end. Prof. Yigael Yadin, the expedition's director, reports that about two-thirds of this magnificent site have been uncovered thus far. Masada is an awesome natural fort near the shore of the Dead Sea. The grueling six and one-half months' toil has produced a host of important finds. These include over 2,200 coins (among them 20 rare silver shekels, the first ones to be found on an archaeological site), and nearly 200 *ostraca* (inscribed potsherds). Manuscript fragments include portions of Psalms, Leviticus, Genesis, and samples of non-biblical literature identical to works found at Qumran (site of the original "Dead Sea Scrolls"). Furthermore, the archaeological context in which it was found proves that the Dead Sea Scrolls were written before the fall of Masada in 73 A.D. The closing days of the season were crowned by the discovery of fragments from the apocryphal *Ecclesiasticus*, also called the Wisdom of Jesus the son of Sirach. These finds demonstrate that *Ecclesiasticus* was originally written in Hebrew, thus confirming the authenticity of the Hebrew text discovered many years ago in the Cairo Geniza (a synagogue storeroom for "burying" old manuscripts). The text discovered at Masada was written not later than 50 B.C. and corresponds to "MSB" of the Cairo version. The variants match those recorded in the margins of the latter manuscript. Some fragments of the Hebrew *Ecclesiasticus* had previously been discovered at Qumran, containing only three decipherable words.

The history of Masada from the Chalcolithic Age (4th millennium B.C.) down to the Byzantine period (4th through 6th centuries A.D.) has been illuminated by these excavations. Its most important buildings date from the New Testament period, i.e. the magnificent fortifications built by King Herod the Great. Herod's palace, built on a series of three terraces at the northern tip, included a colonaded portico decorated with Roman frescoes which remind one of Pompeii. On the cliff above his palace Herod had constructed a classical Roman bath house containing the usual four rooms: a dressing room and the tepid, cold, and

hot baths. Next door was the military storehouse made up of long, narrow rooms full of storage vessels and other interesting artifacts from the Roman period. The so-called "western palace" also testified to elaborate ornamentation, including a beautiful mosaic floor. The small church located almost in the middle of the site possessed a later mosaic which apparently belongs to the 5th century A.D.

Every building on Masada had its own well-plastered water cistern. In addition there was an elaborate system of water storage pools in the northwestern side of the cliff. These cisterns had been fed by an aqueduct which brought water down from the hills on the west. Though the water supply had been cut off by the Romans, one can still see the line of its channel. Prof. Yadin mentioned that he and his staff had many opportunities to witness the aqueduct's effectiveness during this winter's heavy rains!

By far the most dramatic discoveries of all have come from the casemate fortification wall by which Masada was defended. It was reinforced with towers every 60 to 70 yards, as described by Flavius Josephus. The wall itself consists of a series of compartments, which doubtless served as the barracks for Herod's troops. In the Jewish revolt of 66 A.D. the zealots occupied Masada and subdivided many of these compartments into smaller rooms. One of the larger compartments had benches around the walls and is almost certainly a synagogue oriented towards Jerusalem. In another casemate on the southeastern side the excavators discovered a Jewish ceremonial immersion pool (*mikveh*). The important manuscript discoveries mentioned above were made within these various compartments.

The Romans besieged Masada for several months, during which time they constructed a series of encampments and a circumvallation wall at the foot of the mountain. They finally breached the upper fortifications after building a huge ramp for bringing up their siege engines and towers. On the eve of the final assault, when the valiant defenders knew there was no more hope of resistance, they committed mass suicide rather than be sold into Roman slavery. The tragic remains of these zealots in their blood-spattered dwellings testify to the accuracy of Josephus' account.

The work of restoration has been going on simultaneously with the excavation. The Israel Society for the Preservation of Historic Sites will continue its work of reconstruction until November when another four-month season of excavation will begin. It is hoped that Masada will again be open to the public by May, 1965. (For extensive background material cf. M. Aviyonah, *et al.*, "The Archaeological Survey of Masada," *Israel Exploration Journal*, Vol. 7 [1957], pp. 1-60).

En-gedi. Prof. B. Mazar has just concluded another season of excavation at En-gedi. (Cf. *JASA*, June, 1963, p. 61) Efforts were concentrated in two areas, some Persian buildings located on the northwestern side of the tell and a Roman bath house discovered

near the shore of the Dead Sea. This latter find has led Prof. Mazar to suspect that a typical Roman forum may have existed in its general vicinity which still awaits the archaeologists' spade. Though the bath house dates to about the 2nd century A.D., its floor was made up of reused stone capitals in the so-called Herodian style; this means that an elaborate building must have existed there during the New Testament period. The excavators planned to resume their work at En-gedi again in October, 1964.

OLD TESTAMENT

Arad. Dr. Y. Aharoni's second season at this marvelous Judean fortress in the northern Negeb (cf. *JASA*, June, 1963, p. 61) reached a dramatic conclusion last August with the discovery of a small temple, or "high place," dating to the Judean Monarchy. The last week of the season was spent in uncovering the holy of holies of this temple. It appears to have had its beginning in the 10th century and to have remained in use until the reign of King Hezekiah. Two stone altars guarded the raised entrance to the sacred room; three stelae, one painted red, stood just inside. Upon hearing of this discovery, Prof. Mazar made a re-examination of the Biblical passages concerning Hobab, the Kenite, Moses' father-in-law, who led his clan in the conquest of this region. The Kenites seem to have had a long tradition as cultic specialists (cf. Num. 10: 29-32, priests and prophets accompanied the expeditions of antiquity; they gave directions by furnishing oracles and interpreting signs). The Arad temple was evidently a Kenite shrine. One should not be surprised to find a Judean temple outside of Jerusalem; such "high places" were tolerated by many Judean kings (e.g. I Kings 15:14; 22:43). But Arad has provided a striking illustration of II Kings 18:4 which states that King Hezekiah put an end to the worship at these local shrines (cf. the taunting words sent by the king of Assyria, II Kings 18:22). The Arad temple went out of use when it was bisected by a huge fortification wall that dates to Hezekiah's reign.

The total number of ostraca found from both seasons now stands at about 50. Besides an abundance of pottery and other important material from the Iron Age, an Early Bronze city was brought to light on Arad's lower terrace. The third season of excavations is scheduled to open in July.

Ashdod. The second season at this important Philistine city has already been reported (D. N. Freedman, *Biblical Archaeologist*, Vol. 26 [1963], pp. 134-139). Some 20 strata of occupation were identified at various points on the tell. Ashdod began its career as a great commercial and military center towards the end of the Late Bronze Age (16th-13th centuries B.C.). An important public building rich in Mycenaean and Cypriot pottery has been uncovered from this period. The Late Bronze city was violently destroyed in the mid-13th century B.C. as evidenced by a three-foot layer of ash. The Philistine occupation is represented by a fortress from the 12th and 11th centuries B.C.

Philistine pottery had also been found elsewhere on the tell during the first season (cf. *JASA*, *loc. cit.*). The most remarkable Iron Age strata came to light some 300 yards from the main tell. A shrine, or cultic center, was found there from which the excavators have extracted an extensive collection of figurines, both human and animal, and hollow-ringed libation vessels, with animal heads and cups attached, plus some miniature votive altars in the shape of human figures with four-legged tables forming the lower part of their bodies. In the next stratum above, the cultic installation was replaced by an extensive pottery-making industry. A complex of pottery-kilns were found with many samples of contemporary ware *in situ*. This Iron Age city was also destroyed. It is quite likely that the catastrophe was brought about by Sargon II of Assyria who conquered Ashdod in 712 B.C. (cf. Isa. 20:1). The details of his campaign in the Levant are well known from various inscriptions, both at his capital city (Khorsabad) in Assyria and elsewhere. Three fragments of a similar victory stele were discovered at various places on the tell of Ashdod. Dr. Hayim Tadmor of the Hebrew University, who examined the text and script of these fragments, believes that the content of the inscription was quite similar to that of others already known. It probably described the actual conquest of Ashdod. Evidently the Ashdodites smashed the stele when they revolted against their Assyrian overlords. The Persian period is represented by a considerable amount of characteristic pottery and several artifacts, such as a tiny golden ibex, almost identical to one found at Enkomi on Cyprus (4th century B.C.). An ostrakon containing two words and additional markings, written in Aramaic script of the 5th century B.C., belongs to the period of Ezra and Nehemiah (cf. Neh. 13:23-24 concerning the Ashdodite dialect). In the New Testament period Ashdod was called Azotus. Excavations continued to uncover important buildings from this period on the main tell. The expedition has apparently discovered a cult place which was part of the city's great market. A plaque was found there depicting a local goddess with what seems to be a fish's tail.

The expedition to Ashdod has obviously enriched our knowledge with one of the finest and most varied collections of artifacts to be discovered in many years.

Achzib. The University of Rome is cooperating with the Israel Department of Antiquities in investigating the ancient site of Achzib on Israel's northern coast. An east-west cut made on the tell itself revealed a fortification typical of the Hyksos period, consisting of alternating layers of clay and earth, finally covered with stones and another layer of clay. Above this a wall from the Israelite period was found. Inside of these walls six levels of occupation came to light, dating from the 9th to the 4th centuries B.C. The ceramic finds included many samples of Cypriot and Greek imports testifying to Achzib's commercial connections in the Israelite, Persian, and Hellenistic periods. Outside of the wall a series of floors were dis-

covered dating to the early stages of the Persian period, apparently the 6th and 5th centuries B.C. Beneath them were found four typical Phoenician tombs. One of them contained a warrior buried with his weapons: a double axe, a spear, and a sword. A woman was buried at his side, and many other artifacts had been placed around them in the tomb. Investigations were also continued in the eastern necropolis.

Metsad Gozal. Among the many smaller excavations carried out in Israel this year, one of the most recent is that conducted by Dr. Y. Aharoni on a small Edomite fort at the shore of the Dead Sea. The dig was sponsored by the American Institute for Holy Land Studies (Jerusalem), whose students fully participated in the work. The most ancient structure on this site was an Edomite stockade about 20 by 20 yards in size. The walls were built on a foundation of very large stones, and between every two or three courses wooden beams had been inserted; the wood from these braces was still preserved in large measure (carbon-14 tests on this material are now being conducted).

The building complex consisted of a central court with rooms on all sides. The excavators uncovered a room in one corner about seven yards long and two and one-half yards wide. Its walls and floor had been plastered. The pottery dates to about the 11th century B.C., and signs of a fierce conflagration indicate that the place was destroyed near the beginning of the 10th century. Above the burnt layer there were obvious traces of sediment from the Dead Sea, which proved that the fort had been entirely covered by water at a later period. A Byzantine vessel found at a higher level, which was also covered with sedimentary salt, bears witness to a second inundation.

On the last day of work Dr. Aharoni took the students and other volunteers on a brief survey of the Dead Sea area during which they identified an additional fort close to the Beer-sheba—Sodom Highway. Traces of the wooden beams between courses of the wall were plainly visible. It would appear that these forts belonged to a network of Edomite border stations on the western side of the Arabah similar to those discovered by Nelson Glueck on the fringe of the eastern desert. This western network is apparently the "border of Edom" mentioned several times in the Bible (e.g. Num. 20:16, 23; Josh. 15:21). The destruction level at Metsad Gozal bears witness to David's conquests in the Edomite sphere (cf. II Sam. 8:13-14; I Kings 11:15-16; I Chron. 18:12-13).

Some interesting conclusions of a scientific nature can be deduced from these excavations concerning the level of the Dead Sea which is associated directly with the annual rain fall. At present the top of the fort is over 30 feet above the water level (the Dead Sea itself is about 1200 feet below sea level). Twenty or 30 years ago the sea had risen to a point some 10 feet or so below the top of the fort. However, at the time when the Edomites occupied the site, the Dead Sea must have been at about the same level as today. The ex-

perts presently examining this evidence will therefore be able to tell us something about climatic conditions in the Davidic period.

This representative sampling will give some idea of the intensive archaeological activity taking place here in Israel. Surveys, excavations, and accidental discoveries are being made in every region of the country.

Contributed by A. F. Rainey, Lecturer in Ancient Semitic Languages at Tel Aviv University and lecturer in Historical Geography at American Institute for Holy Land Studies, as requested by G. Douglas Young, contributing editor.



ON THE PATHOLOGICAL NATURE OF SOCIAL PROBLEMS

When one considers the guise of the sociologist, the inclination is to either observe him poking through the cloudy heights of general theory, or else adding the noses of crowd members. Obviously, neither image is quite correct.

Perhaps it is preferable to view him as somewhat of an iconoclast whose purpose it is to provide the interjectory question and to direct the conversation into seemingly unfruitful fields. He remains somewhat of a skeptic, unwilling to accept folklore as fact or statistics as meaningful. By virtue of the need to cover vast areas of human behavior, he will find himself constantly raising more questions than he answers. Perhaps his proper function should be that of "eyebrow raiser."

Even though such an image of the sociologist is not well known, there is much basis for viewing him in this light. Whether, as an existentialist, he requests that we not "take the world for granted" or, as a structural-functionalist, he seeks out consequences of action which are latent, there is always the desire to not close the case until all the evidence is in, even if the defendant must be condemned as a result.

The sociologist, then, should consider all alternative behavioral patterns as possible explanations until proven otherwise. There is a need to maintain an open theoretical system, for to close it too hastily might lead to possible error. Such consequences might go beyond simply the inability to know "truth". In the area of social engineering, the establishment of policy based on prejudiced views and limited perception can be a costly undertaking indeed.

A recent text in social problems takes cognizance of this condition in its introductory remarks. The statement, which had been briefly referred to in an earlier issue of the *Journal*, clearly raises the possibility that conditions leading to social problems may be non-pathological. It would behoove the Christian to carefully consider the options inherent in such a possibility.

One final word could be made about this statement. Nisbet underscores, once again, the need to maintain a form of insulation among our various roles. In the final analysis, this might resolve itself into that well known dichotomy which exists between the subjective and the objective attitudes toward familiar things. Let us review, then, this contemporary opinion with the realization that the ultimate resting place of his comments should be on the responsibility of the individual whether he be Christian, scientist, citizen, or some curious combination of these roles.

* From a strictly theological point of view, many of the problems treated in this book are, first and last, violations of a divinely sanctional moral order. As such they are often considered to be manifestations of evil, of original sin. The theologian will concede readily that such acts as murder, adultery, and theft are susceptible in part to nonreligious explanations, to influences of environment; and he will, if he is engaged in pastoral work, not hesitate to avail himself of the help of legal and social agencies. But, as a theologian, he will probably choose to see the final explanation of these acts in terms drawn from religion itself. He will see them as violations of God's commandments, as sin. And, like the explanation, the ultimate solution is put by the theologian in religious terms: expiation through prayer and penance . . .

When we turn to the scientific consideration of social problems we are in a different world of thought and discourse. Here the objective is not popular exposure or moral dramatization any more than it is expiation of evil or upholding of the law. The scientist, as citizen, as member of a religious group, will not dispute that murder, racial persecution, and narcotics addiction are illegal or evil. He may deplore these acts in the same terms as other citizens; he may join, on occasion, in exhortation or political action. But, as a scientist, he is interested in something else, something very different from the older and more common approaches. He is interested in understanding these pathological social actions in exactly the same way that he is interested in understanding the normal and the good. In his strict role of scientist, as seeker of knowledge, he cannot be interested in exhortation or repressive sanctions

except insofar as these responses are themselves involved in the nature of the social problems he is concerned with. What the scientist, as scientist, seeks is knowledge of the conditions involved, how the problems have come to be as we find them, and what the crucial factors are in their incidence. It is not action that the scientist seeks but hypothesis—clear, verifiable, and valid statements of causation.

Nothing could be more false than the occasional charge that sociologists are indifferent to moral standards; that for them one form of behavior is as good or bad as the next; that relativism is the moral code by which men should live. It would be as true to suggest that the medical scientist is indifferent to the agonies of cancer because, instead of relying simply upon prayer or anesthetics, he insists upon the long-run study of this disease, upon approaching it in the same way that he would approach benign or normal aspects of organic functioning.

The scientist is as interested as the next citizen in making the protection of society his first responsibility, in seeing society reach higher levels of moral decency, and, when necessary, in promoting such legal actions as are necessary in the short run for protection or decency. But, as a scientist, it is his professional responsibility to deal with such matters as crime, suicide, narcotics, and ethnic tensions exactly in the manner in which he deals with other forms of human behavior.

This leads us to an important point about social problems. In the popular view, as the result of our religious and philosophical heritage, we have a tendency to think of social problems as the consequence solely of evil or undesirable elements. For centuries a large part of Western ethics has been based upon the view that only good can come from good; only evil from evil. If there is crime, it is because of evil persons, evil groups, evil values.

Yet, as every chapter of this book makes clear, much of what is associated with our social problems is closely related to things we deem good. This is patently true of transportation congestion and other aspects of urban blight: apart from the good and desirable values inherent in city life, values which attract people in large numbers, many of the ills would not exist. This relationship is true also of the difficulties presented by population growth. Plainly there is nothing intrinsically evil in having large families; an entire morality rests upon the Biblical injunction to be fruitful and multiply. For thousands of years high birthrates were necessary and functional, so far as the preservation of society was concerned. But today, in many areas, as the result of sharply lowered death rates, the growth of population has become one of society's most formidable problems.

Similarly, in crime, suicide, and family disorganization, we often discover processes of behavior which, if not necessarily beneficent, are at least normal to human endeavor in our society. This is not said in moral

exoneration. Stealing is wrong, and it can constitute a serious problem to any community that prizes its own survival and integrity. Sociologists, however, interested in the causal conditions of types of crime, cannot overlook their effective contexts: the incentives, goals, status drives, and role needs which characterize our society. We may deplore our high rate of divorce, to be seen often tragically in broken homes and personalities set adrift; but we cannot isolate this divorce rate from a society that sets a high value upon individualism, romance, and contractual ties.

Too often the popular view of social problems likens them to cancers; for most citizens, the image of society and its problems is that of an essentially healthy organism invaded by alien substances. The legislator, or policeman, is thought of as a kind of physician, bound to remove the cyst, destroy the virus, but without altering the character of the organism itself.

Such an analogy seriously distorts social reality. We shall discover in the chapters of this book that social problems, even the worst of them, often have a functional relationship to the institutions and values by which we live. We cannot divorce racial and ethnic discrimination from the complex of customs that have sometimes given discrimination a wide variety of functions in our economic, political, domestic, and recreational affairs. We cannot separate many of the discontents of work from our own development of more cultivated standards of existence, of leisure values that we properly cherish. Even prostitution exists only as a reflection, so to speak, of the value we place on the monogamous family and the sanctity of marriage.

* From *Contemporary Social Problems*, edited by Robert K. Merton and Robert A. Nisbet © 1961 by Harcourt, Brace & World, Inc., and reprinted with their permission.

RUSSELL HEDDENDORF

A PLEA FOR IDEAS

Robert Maynard Hutchins is credited with commenting, "Whenever I feel the urge to exercise I lie down until it goes away." This seems to be the principle by which I conduct my correspondence. This dilatory approach has choked off literally hundreds of letters to editors and authors—largely to the benefit of mankind. But this does make it seem appropriate to begin this shake-down cruise of my contributing editorship with long overdue acknowledgement of my indebtedness to those whose articles, commentary and letters have made this journal frequently so profitable. Special appreciation goes to my predecessors, Philip Marquardt and Stanley Lindquist, for the many stimulating ideas and helpful suggestions I gained from their contributions.

Perhaps this is the best time to purge myself of an idea that has been slithering about in that primeval ooze I call my mind. It has to do with the adequacy of perspective shown by many ASA members toward our avowed task: "to study those topics germane to the conviction that the framework of scientific knowledge and a conservative Christian faith are compatible."

The quote is from the inside of the journal cover. The nagging concern I have is this. Much has been said in the journal concerning origins as set forth in Genesis and in contemporary scientific thought. Some excellent material on issues in philosophy of science has appeared. Both emphases are a needful expression of the aims of the ASA. Yet it seems to me that our major task should not be conceived as apologetic. To get at what I am groping for, I must expose my naiveté. Recently I was gripped by the *National Geographic's* account of the experiment in undersea living directed by Jacques-Yves Cousteau. Hints concerning the possibilities inherent in learning to read the DNA code likewise tantalize. Information of these and other important scientific work frequently appears in the pages of this journal, but unless it bears on origins or some issue in philosophy of science it is not always clear whether or not it has a bearing upon the Christian world view. What I'm getting at is that I remember an article Edward Carnell wrote for *His Magazine* several years ago. Its title, as I recall, was "Beware the new Deism," and Carnell built a case for the thesis that except for some preoccupation with correlating the Genesis account with scientific discovery, Christians in the sciences tended to handle the data of their field with an uncritical acceptance of many of the ways of thinking in science which made God an unnecessary hypothesis. No small number of ASA members took personal unbrage at this, and yet it seems to me Carnell has a point. Is there a tendency among us to view our task too much in terms of apologetics and too restrictedly as the defense of the Biblical account of origins? Do we otherwise not let our scientific left hand know what our Biblical right hand is doing? Do we perhaps need to spend as much time during the next two decades working out the implications of new information for a positive Christian world view?

Now that I have thus purged myself, permit me to say a bit about myself and this department. Psychologists divide into those with an experimental attitude and those with an applied attitude. The former regard themselves as scientists and in turn frequently regard the latter group, by and large practitioners of some sort, as an incumbrance. The largest group of applied psychologists include those variously labelled "clinical" and "counseling" psychologists, whose principal professional activity is involved with the healing of disturbed persons. Since I fall into this latter category I am not equipped to give the experimental side of our discipline its due. (This also accounts for my unseemly propensity for adopting a personal tone in a journal devoted to science.) To fill in for my deficiencies I hope that this column can become something of a clearinghouse. May I urge my professional colleagues in the ASA to send in ideas, letters, articles, or just informal memorandums commenting on this and that. I shall do my best to incorporate these when possible giving full credit to all save those who prefer to remain anonymous. A little help, please.

LARS I. GRANBERG

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BOOK REVIEWS

TOWARD KEEPING UP

To one who wishes to keep up with thought in disciplines or emphases other than his own, the publishing houses of Prentice-Hall, Inc. (Englewood Cliffs, New Jersey) and Holt, Rinehart and Winston (New York City and elsewhere) are in my opinion making a real contribution by the publication of their neat and attractive series of summaries of the current status of various subjects. Prentice-Hall has several series under the general title of "Foundations of . . .", for example, their FOUNDATIONS OF PHILOSOPHY SERIES with more than a dozen titles (some yet to be published) such as *Philosophy of Mathematics* (Barker), *Philosophy of History* (Dray), *Philosophy of Natural Science* (Hempel), *Metaphysics* (Taylor) and their FOUNDATIONS OF MODERN BIOLOGY SERIES with about the same number of titles like *The Cell* (Swanson), *Heredity* (Bonner), *Animal Diversity* (Hanson) and *Man in Nature* (Bates). Holt, Rinehart and Winston's MODERN BIOLOGY SERIES parallels the latter series with such titles as *Cell Structure and Function* (Loewy and Siekevitz), *Genetics* (Levine), *Animal Structure and Function* (Griffin) and *Ecology* (Odum). Published in sturdier-than-usual 6 x 9 paperbacks with sewed fascicles, these books are usually somewhat over 100 pages long and sell for under \$2. As you can see the authors are top-notch and apparently plan to keep their books quite up-to-date through frequent revisions, some of which are already appearing. The main objective of these series is to supplement beginning courses with more advanced or up-to-date material than may appear in the regular text and to give an adequate introduction to each of the specialties indicated by the titles. As such they provide a concise and readable review and survey of the present status of each emphasis. Several of the emphases are pertinent to the concerns of ASA and it is hoped that further reviews of some of them will appear from time to time.

The particular emphasis at this time is on Jay M. Savage's *EVOLUTION*, 1963, one of the Holt, Rinehart and Winston series. In a recent review in *Science* (143:1318, 1964), Slatis summarily dismisses this book as "catastrophically bad", deplors the genetic background laid therein, misunderstands and hence wrongly accuses Savage of grave error on page 41 and suggests that "no instructor should lead a student into this morass." Perhaps his most pertinent assessment, however, is that, "There is a tendency to state opinions and theories as if they were facts." (This is different?) I do not agree with Slatis that this book is that bad. If his last-quoted statement is remembered as the book is read, a good short account of many of the current approaches to evolutionary studies is given. In fact, some of the weakness from Slatis's point of view becomes instructive from the point of view of the critical ASA member as he reads, because here he can get

a grasp of what J. M. Savage, "Mr. Average Evolutionist," is thinking, and of the presuppositions upon which he bases his investigations and his theories.

Inasmuch as I think each of you should read this book, I shall refrain from doing a précis of it, but rather shall make several comments which I hope will drive you to the source for verification. Savage's *Preface* is very important to our understanding of both Savage and his book, and, as I have previously indicated, the tenor of the field today.

(1) Savage approaches "evolution" as a *subject*, a subject fundamental to the proper understanding of biology.

(2) Savage treats "evolution" as a *fact*. "No serious biologist today doubts the fact of evolution, the development of all living organisms from previous existing types under the control of evolutionary process." (page v.) This is reminiscent of that old adage upon which most of us cut our biological eyeteeth, "*Omnia viva ex vivo*."

(3) Savage makes a distinction between the *fact* of and the *theories* of "evolution." "The concern here will be with what is known about the process of evolution and a survey of the several theories proposed to explain the process." (page v.)

(4) The concern of Savage is mainly, if not completely, with the changes observed to be taking place within or between populations of the same species or of closely similar species. "The present book is unique among discussions of evolution at the college level in its emphasis on the two crucial unsolved problems in the understanding of the evolutionary processes: (1) By what means do isolating mechanisms develop to prevent genetic exchange between related populations of organisms and lead to the origin of species? (2) What processes are responsible for the origin of major evolutionary changes above the species level? The ultimate solution of these problems is left, hopefully, to readers of this book." (page vi.) When one turns to chapter 10 on *EVOLUTION ABOVE THE SPECIES LEVEL*, it is interesting to find that except for a few lines on page 106, Savage is still referring to what might conceivably take place at the species level.

This book suffers, as will any short survey, for want of extended example and illustration. I am, nevertheless, amazed at the amount of material Savage compresses into 126 pages of well-illustrated, indexed discussion of the genetic basis and divergent data observed in natural populations. This readable presentation requires no technical background on the part of the reader. Following each chapter are listed several well-chosen source references for further information on each phase.

It seems to me that one of our tasks as creationists is to distinguish in a positive manner between created fact and limited and hence often distorted explanation so that we may assess both the facts and the explana-

tions. Savage, in realizing the difference, has helped us on our way.

* * *

Another series of books which is proving a continuing delight for both me and my children is the periodically published LIFE NATURE LIBRARY. Presenting its 16th, 17th, 18th, and 19th volumes (*The Land and Wildlife of—Eurasia*, by Francois Bourlière, noted French mammalogist; *Australia*, by David Bergamini; *South America*, by Marston Bates; and *Tropical Asia*, by S. Dillon Ripley) so far this year (1964), previous volumes have dealt with the sea, forest, desert, mountains, poles, earth, and universe, and with various groups of organisms such as insects, fish, reptiles, birds, mammals, and plants in addition to summary volumes on ecology and evolution. Superb and usually well-chosen photos, many of them in color, and sharp and helpful marginal sketches explain points in the succinct, readable text. The format made famous by *Life* of about twice as much space devoted to pictures as to text is not always appropriate to the subject matter, and hence captions sometimes stretch a bit to make photos relevant if they do at all. Half or more of the photographs have been used previously by *Life*, but the text and sketches are new. To say the text is authoritative is perhaps dignifying these popularizations beyond their scope, but most are written by authors of note and of some scientific status (Bourlière, Bates, Fritz W. Went, Roger Tory Peterson) backed by *Life's* board of editors. The text then is dependable but coverage varies from volume to volume, some giving a coherent survey of its subject and others merely cataloguing certain interesting facts.

EVOLUTION (1962) by Ruth Moore et al (192 pages) is one of the more well-rounded summaries of a field. The coverage, it seems to me, is more balanced and certainly more to the point than Burnett's *Darwiniana The Wonders of Life on Earth* also published by *Life*, which covers some of the same material and on which the present volume draws to some extent.

Beginning with a short historical survey emphasizing the voyage of the *Beagle*, attention is given to the development of some of the pertinent discoveries of the *Beagle* on Tierra del Fuego and the Galápagos Islands as they applied to Darwin's thought. A brief review of basic genetics helps the reader understand how plant and animal breeding has been manipulated under domestication, and the nature of the genetic materials is well illustrated. The methods and materials of paleontology are discussed with some indications of the probable significance of such data. The last three chapters are concerned with the evolution of man and are more ostensibly theoretical than the rest of the book. Still there is a good survey of the data available with facts and figures concerning the major human-like fossils as well as some of the artifacts discovered. The picture story, much of which has appeared previously in *Life's The Epic of Man*, emphasizes the human traits of primates and the reconstruc-

tions based upon the fossil evidence. The book closes with notes on races and human hereditary traits.

Naturally there is little new in this presentation, but the account is valuable for its delineation of the facts involved in the historical development of the theory of evolution. Little overlap can be found between this book and Savage's book by the same title. While Savage is interested in how the environment can work upon a genetic matrix to fix certain patterns in a gene pool, the *Life* book is interested in the theory that natural selection has been active in bringing about a great diversity of living things and in how this theory has been developed and is applied. While Savage addresses himself to the question of "How?" the *Life* book is more interested in the question of "What?"

Of greatest personal interest to me in the *Life* book was the chart on pages 156-157 proposing a phylogeny of man on the basis recently suggested by Coon, who was a consultant for this volume. This proposal suggests what is technically known as a polyphyletic origin for the major races of man on what appears to be a consistent ecogeographical basis—Australoids from Java man, Mongoloids from Pekin man, Caucasoids from Swanscombe man, and Negroids from South African man. Although Coon has received considerable heat from other anthropologists and evolutionists on this theory proposed in his *Races of Man*, 1962, Knopf & Co., the creationist can certainly see a consistency here for the development of Adam's descendents. Although the chart sets Leaky's *Zinjanthropus* off by itself, there is a current tendency in the field (and even by Leaky himself) to lump this form with the other australopithecines (South African men), which does not disturb the rest of the chart.

I recommend this book for giving *one* of the current approaches to the theory of evolution and the data consistent with this approach. As noted in the case of Savage, it would be erroneous to conclude that this approach reflected adequately the concern of all students of evolution or even that it is the only approach considered by them. Much current work is directed to problems not apparent through the monophyletic historical approach outlined by Miss Moore.

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GOD IN THE SPACE AGE

by Martin Heineken, John C. Winston Co., Philadelphia, 1959.

While briefly browsing through the El Paso, Texas, public library last summer, I noted the above title. The author is Professor of Systematic Theology and is employed at the Lutheran Theological Seminary in Philadelphia. As the title indicates, the book is about the impact of space travel and space knowledge upon our concept of God. Although Professor Heineken discovered interesting aspects of this subject he digressed too many times and one, therefore, tended to lose the thread of the argument being presented.

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Regarding life on other planets, it is estimated that there are about 100 billion planets in our galaxy, (give or take a few billion) and that there are about 99 billion other galaxies beside ours. Thus there seems to be a mathematical possibility that conditions somewhere are suitable for supporting life. Some have reasoned that some extra-terrestrial men may have sinned and are in need of missionaries from the earth. Others think there may be sinless creatures living beyond the reaches of our telescopes.

One of the interesting questions raised is the exact location of God and whether space travel will eventually find Him? Professor Heineken believes that God is not exactly in our space-time continuum. If He were, He would not be above his own creation. This whole matter is rather "sticky". No clear-cut answer is possible but the author believes that God may be both within and without our frame of reference.

Many other interesting questions are raised and it is my opinion that many people in our group will profit by reading this book.

Irving W. Knobloch

IMPLICATIONS OF EVOLUTION

by G. A. Kerkut

Pergamon Press: International Series of Monographs on Pure and Applied Biology. Volume 4, 174 pp. 1960.

After over a hundred years of debate and controversy in the general area of "evolution" and the Bible, it would seem that the major problems should be clarified to at least the point where there is some agreement on definitions. But it is at precisely this point where the Christian biologist encounters some of his greatest frustrations. And these frustrations come from theologians, from fellow biologists, and even from fellow Christians in non-biological areas of science. To the theologian and the clergyman the Christian biologist appears too ready to "accept evolution" and, since evolution is an evil hypothesis, it must be *totally* rejected. This theological rejection must be on the basis of Biblical interpretation regardless of any scientific evidence. On the other hand, to those biologists who are not the least concerned with being biblical, evolution is a "fact," the Bible contradicts this fact, and as a scientist he must accept the fact and reject the Bible. In this situation the Christian biologist becomes a contaminated evolutionist to many of his non-biological Christian friends and a medieval creationist to most of his fellow biologists. While such classifications can never be completely avoided, especially with many of the protagonists emotionally rather than rationally committed, it is most unfortunate that the defenders of one position must persist in gross ignorance of the basic aspects of other viewpoints. It is even more unfortunate that people involved in such controversy can't at least define their own terms before they make the argument emotional. It is in the context of this problem that G. A. Kerkut's IMPLICATIONS OF EVO-

LUTION comes as a stimulating breath of fresh air to the Christian biologist.

The only axe that Kerkut grinds is that of scientific honesty. The book is not anti-evolutionary; and the conflict of evolution and the Bible is not mentioned. In fact, in the preface Kerkut explains his position (p. vii). "May I here humbly state as part of my biological *credo* that I believe that the theory of Evolution as presented by orthodox evolutionists is in many ways a satisfying explanation of some of the evidence. At the same time I think that the attempt to explain all living forms in terms of an evolution *from a unique source*, though a brave and valid attempt, is one that is premature and not satisfactorily supported by present-day evidence. It may in fact be shown ultimately to be the correct explanation, but the supporting evidence remains to be discovered. We can, if we like, believe that such an evolutionary system has taken place, but I for one do not think that 'it has been proven beyond all reasonable doubt'." It is to clarify this problem that Kerkut has written his little book.

He begins with an amusing account of the typical undergraduate (British) attitude on the subject. This undergraduate, while obviously better informed than most of our American undergraduates, is described as an "opinion-swallowing grub" who "repeats parrot fashion the views of the current Archbishop of Evolution." It might be well to emphasize here that this is not the raving of an anti-evolutionary Fundamentalist but the expressions of a well-recognized Comparative Physiologist, editor of the most recent edition of that classic text: Borradaile and Potts, *THE INVERTEBRATES*.

Kerkut lists (p. 6) seven basic *assumptions* that are seldom regarded as such in discussions of evolution. These assumptions are:

- 1) Non-living things gave rise to living (spontaneous generation).
- 2) Spontaneous generation occurred only once.
- 3) Viruses, bacteria, plants and animals are all inter-related.
- 4) The Protozoa gave rise to the Metazoa.
- 5) The various invertebrate phyla are interrelated.
- 6) The invertebrates gave rise to the vertebrates.
- 7) Within the vertebrates the fish gave rise to the amphibia, the amphibia to the reptiles, and the reptiles to the birds and mammals.

These assumptions form the "General Theory of Evolution" and are by their nature "not capable of experimental verification". Even though some of these processes may be simulated today this shows only that such processes are *possible*; it does not prove that they did occur.

The next seven chapters of the book are concerned with evaluating the evidence for these assumptions. In this Kerkut nicely documents the varying interpretations of the evidence. Whether he is discussing the interrelationships of the lower protistan groups to each other and to the higher plants and animals (Chap. 3), the relationships of the various protozoan

groups (Chap. 4), or the relationships of the invertebrate phyla (Chap. 7), Kerkut carefully points out that there are usually several mutually exclusive hypotheses for solving each of these problems. The longest chapter in the book (Chap. 6, 50 pp.) discusses which metazoan groups are the most primitive and the possible interrelationships of these primitive groups. His conclusions in this matter are of considerable interest:

There are, as we have seen, five contestants, Porifera, Mesozoa, Coelenterata, Ctenophora and the Platyhelminthes, for this title. These groups are almost completely isolated from each other though a few tenuous connexions can be made . . . We are still very ignorant about the comparative physiology and biochemistry of the lower Metazoa and very little experimental work has been done on their embryology . . . It is also possible that the new information will indicate more clearly that the Metazoa are polyphyletic.

In these days of emphasis on the biochemical aspects of life biochemistry is often used as the clinching evidence for evolution by many college biology texts. It is, therefore, refreshing to hear a physiologist-biochemist discuss, as Kerkut does in Chapter 8, "Biochemical Studies of Phylogeny". Of particular interest, is his examination of the problem of the phosphagens, important high energy, phosphorus containing compounds of protoplasm. The usual presentation of the data in this area indicates that vertebrates have phosphocreatin, most invertebrates have phosphoarginine, while the echinoderms and primitive Chordates have both. Therefore, the vertebrates evolved from the echinoderms. Kerkut shows that this is an incomplete and unfair presentation of scientific fact. Referring to recent reports of numerous investigators, he points out that, not only are both of these compounds so widely distributed throughout the animal kingdom as to show little phylogenetic pattern, but there are also other similar organic phosphates that confuse the picture even more.

Aside from this readable and informative presentation of these generally ignored aspects of the evidence for the theory of evolution, I think there are two features of Kerkut's book that are of special importance to Christian biologists. The first of these is Kerkut's repeated references to the "polyphyletic" nature of many animal groups. While this is not new in this book it is well emphasized that at least some of the groups in the animal kingdom probably had many origins and that, therefore, they did NOT originate from a common ancestor. Such an idea is a long way from Darwin's *Origin of Species* and any "fact" of general evolution that could possibly conflict with the Genesis account. This is a most significant development. It does not prove evolutionary gaps or miraculous interventions or any of the many interpretations of Genesis. But it does make perfectly clear to any honest person that the phylogenetic trees that are fed to our students, graduate and undergraduate, are sheer speculation with little real evidence to support them. To continue to give more than speculative value—and speculation can be a valuable research tool—to these trees does a disservice to the truly scientific search for truth.

The second contribution of this book that is of value to Christian biologists is best given in Kerkut's own words. In the concluding paragraph of the last chapter he says:

There is a theory which states that many living animals can be observed over the course of time to undergo changes so that new species are formed. This can be called the "Special Theory of Evolution" and can be demonstrated in certain cases by experiments. On the other hand there is the theory that all the living forms in the world have arisen from a single source which itself came from an inorganic form. This theory can be called the "General Theory of Evolution" and the evidence that supports it is not sufficiently strong to allow us to consider it as anything more than a working hypothesis. It is not clear whether the changes that bring about speciation are of the same nature as those that brought about development of new phyla. The answer will be found by future experimental work and not by dogmatic assertions that the General Theory of Evolution must be correct because there is nothing else that will satisfactorily take its place.

Some may recognize here concepts similar to Goldschmidt's macroevolution and microevolution. However, Kerkut's terms are more workable because they do not restrict demonstrated "evolution" to changes that occur *within* the species. Since in most animal groups we still have "lumpers" and "splitters" when it comes to describing species, there is no reason to insist that evolutionary changes take place only within the species. All—including conservative theologian and agnostic scientist—should recognize the importance of the historical fact that it was the Swedish biologist Linnaeus, in the middle of the 18th century, that claimed that God created the "species." And this "species" was defined, not by the Bible, but by Linnaeus! Since the Bible does not mention "species" there is no foundation for "fixity of Species" in Genesis, uninformed theologians and biologists notwithstanding. When this is fully realized the impact of Kerkut's sceptical evaluation of General Evolution furnishes a fruitful area for research and speculation.

This book does not profess to give pat answers. It does, however, call the 20th century scientific world to account for its readiness to dogmatize on the basis of insufficient evidence. If Kerkut gets his message across to biologist and clergyman alike the book could become a classic. Unfortunately, there are too many that, even after Kerkut, continue to insist in the "fact" of evolution solely "because there is nothing else that will satisfactorily take its place." But his main theme is still valid and of the utmost significance to all. Let's define our terms in an honest and scientific fashion. To the Christian theologian I can but add the admonition that they recognize that "Special Evolution" has no relation to Genesis or the problems of atheistic materialism. It is only when the phenomena of "Special Evolution" are assumed to account for an unproven and unproveable hypothesis of "General Evolution" that the Biblical concept of creation could be involved. Certainly no one who would be an authority for or against "evolution" should fail to read this short, well-written book.

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LETTERS TO THE EDITOR

ETS AND ASA; SOCIAL WORK

I believe that Evangelical Theological Society and American Scientific Affiliation need each other. I know that it is next to impossible for theologians to keep up with the new developments in science and on the other hand I am appalled at the freedom with which our Christian scientists are toying with the Biblical texts. I may soften that by adding that our theologians are doing so too and so the scientists naturally are taking it up. But the scientists should have a chance to hear the criticisms of various theologians rather than jumping to the first far out exegesis of Genesis that seems to meet the scientific need. I thought that the meeting at Asbury was very helpful. I was glad to hear of European scientists who are questioning evolution and evolutionary datings more, apparently, than our American ones. After all, it is plain that the evolutionary theory like higher criticism stemmed from an Hegelian background. Europe has thrown off this Hegelian yoke earlier and more completely than America. Now the question is how much of the debris of the past is philosophy and how much is fact. Of course, I was disturbed to see that there were few at Asbury representing an important wing, perhaps the leading section, of the American Scientific Affiliation.

May I question the review by Bube of Beegle's book in the December 1963 Journal? I thought it gave the book far too much attention. I noted that *Christianity Today* passed off the book in about five lines as a book which would have been significant fifty years ago. Beegle's book raises many of the usual problems for inerrancy, but answers to most all of them have been suggested, and I should think a review of this length should suggest more answers rather than to commend Beegle and urge a "hard look" before "taking up the cry of heresy."

Further, I should like to comment in an informal way on the December critiques of Herje's article on social work. I, for one, very much appreciated his article. I thought it was a good reminder of the errors of Freudianism and of the dangers of using its theoretical basis as a foundation for extensive practical social work. I question Larson's remarks that the article put together unrelated items. Larson omitted the point that Herje made that social work of today is largely based on Freudian theory. This at least was Herje's claim, and Larson does not deny it. He merely states that attack on Freudianism does not logically question modern social work itself. Herje gave at least some evidence to show that these were not "distantly and inconsistently related subjects." Pattison's analysis was perhaps better. But I question the idea that the social worker's role can be functionally defined with-

out reference to its theoretical basis. There is a vast difference between a social worker who has a Freudian theory and one who has a Christian theory. His example of a minister who may see himself as a heavenly messenger or as a social worker yet may function identically is particularly strange. That is just the trouble. We have two types of ministers in the country and they are poles apart. They represent different religions. They both preach and get clergy rates, but they can hardly be said to "function identically" in social matters. Pattison does not answer his question "How can we frame a program of social action which is true to Christian principles when the society operates in reference to the principles of Naturalistic scientism?" He adds, "Can a Christian attempt to change the metaphysical and operational values of his professional system, and if so, how?" These are good questions. But certainly a Christian can attempt to change the values of his profession if they are anti-Christian, and if he cannot, he should start a new competing profession. It is hard to imagine a Christian bartender! A converted Christian crook gets out of the business. I regard the school of psychoanalysis as so directly anti-Christian that a Christian should disassociate himself from it. And in doing so, he should oppose social theory and work built upon those principles. I am sure I would be regarded as quite extreme, but I am not sure that we need to "frame a program of social action which is true to Christian principles." The Bible does not envision such, outside of the principles of charity and individual assistance which hardly go as principles of social action today. Promoting the general welfare is not exactly a Christian goal. This is in the realm of common grace. Herje's claim was that the public social work of today is not built upon the acknowledged moral standard of our government and American life, but upon an anti-Christian theory. I have seen the same thing in psychiatric approach. A doctor by his theory of mental ills may come into opposition to the minister in his application of the Biblical teaching of sin. A prominent psychiatrist here threatened to have a minister friend arrested for interfering with his treatment of his patient! Not all psychiatry is thus antithetical, but much is, and Herje's point was that much social theory and practice was built upon this anti-Christian position. All non-Christian work is not anti-Christian. Our normal police and court procedures are not anti-Christian. I believe psychoanalysis is anti-Christian.

James actually said that "Psychoanalysis is foundational in the profession's understanding of human psychodynamics". I can only think that the profession has profoundly misunderstood human psychodynamics. I understand that psychoanalysis is the Freudian type of psychiatry. Some psychiatry is truly Christian. Psychoanalysis is so greatly off center that I believe such a synthesis as James pleads for would come only at the expense of the truth.

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JOB AND THE OSTRICH

To answer Dr. Roux's mistaken belief that I am "too biblically minded", p. 64, *JASA* 16(2), I count this a compliment of which I am not yet worthy. The answer to Dr. Moberg's query, p. 35, of that same issue, "Can anyone be 'too biblically minded'?" is *negative*. Evidence from numerous Scriptures including Psalm 119 and Deuteronomy 6:4-9 shows that it is well-nigh impossible to err by being *too* Biblical. It behooves all of us in ASA to immerse ourselves more deeply in Scriptures. Chances are that none of us will ever be Word-centered enough to be worthy of the phrase "too biblically minded."

The answer to Dr. Roux's scientific objections comes from the data themselves which can be examined in *JASA* 15(4):107 ff.

1. Although the prickly pear is an "invader" (as Dr. Roux indicated) it is true that the *foolish* ostrich is one of the few creatures that will consistently kill itself by overindulging in these plants.

2. The Bible was written to the entire genus *Homo* despite the limited scientific or professional vocabularies that some may have in the 20th century. An ostrich that pulls its head off in a fence, poisons itself with swallowed pennies, or runs off on its chicks is behaving *foolishly* from the human standpoint. There is no conflict.

3. Fundamentalists did not originate the judgment that ostriches are deprived of wisdom. This idea was perpetrated by the Sovereign Jehovah. Dr. Roux admitted this but then proceeded to deny it.

4. The data of Schreiner and Martin indeed came from agricultural situations. The Scripture account is in complete agreement with these data, nonetheless. Damir confirms similar nesting negligence among the wild birds.

If the entire Bible is the inspired Word of God to all

men, then we would expect Biblical accuracy to the last scientific detail—as demonstrated in my previous article. Such scientific confirmations may disturb some people but they do not upset fundamentalist biologists. The apostle Paul exhorts young Timothy (and ASA scientists!) to remain true to *fundamentals*.

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SCRIPTURAL INERRANCY

The article "A Perspective in Scriptural Inerrancy" by Richard H. Bube, which appeared in the *Journal* for September 1963, is written in a fine spirit of Christian devotion. It is evident that the author sincerely believes in our Lord Jesus Christ. However, it seems to me that he has abandoned anything which can properly be called the doctrine of Scriptural *inerrancy*. He is convinced, no doubt, that he has something in his distinction between "inerrancy" and "arbitrary inerrancy", but I confess that to me this is a spurious verbalism. The inerrancy of the Scripture surely means that the Bible does not teach error in anything it teaches.

The difficulties involved in this article, as I see it, would be greatly clarified by an understanding of the principles of grammatico-historical exegesis. There is a large area bordering between the material sciences and theology in which a common vocabulary must be developed. We need an understanding of scientific hermeneutics.

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