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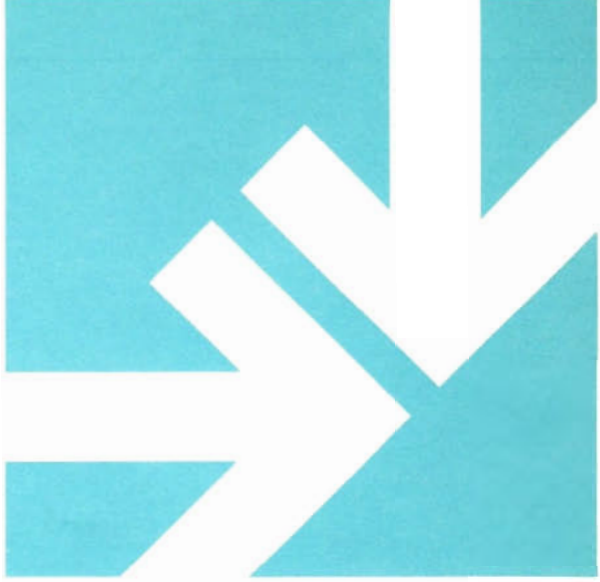

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JOURNAL OF THE AMERICAN SCIENTIFIC AFFILIATION

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THE THEOLOGIAN'S CRAFT:

A Discussion of Theory Formation and Theory Testing in Theology

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What is it to "do theology"? Numerous conflicting and inadequate answers (e. g., Bultmannian existentialism, the post Bultmannian "New Hermeneutic") hold the field today; these have in common a basic misunderstanding as to the relation of theological theorizing to theory construction in other fields of knowledge, and a fundamental misconception in regard to the proper way of confirming or disconfirming theological judgments. In this essay, a detailed comparison between scientific and theological methodologies is set forth, and the artistic and sacred dimensions of theological theorizing are explicated by way of an original structural model suggested by Wittgensteinian philosophical and linguistic analysis.

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Scientists are generally at a loss to know precisely what theologians *do*. Mailmen deliver letters; bartenders serve numerous varieties of firewater; otorhinolaryngologists concern themselves with ears, noses, and throats: but what exactly do theologians endeavor to accomplish? The aura of mystery surrounding theological activity troubles not merely the scientist, who generally has a clear-eyed view of his own professional function, but also the so-called "average man," who, though his awareness of his own role in life may be exceedingly vague, is even more troubled by the peculiarities of "religious" vocations. The wry comment of the parishioner, "We take care of pastor in this life and he takes care of us in the next," well illustrates the gulf that, in general, seems to separate theological activity from the meaningful work of the world.

A theologian of course theologizes, i.e., he does theology. But the tautological character of this statement requires us to press on: What is it to "do theology"? Etymologically, as everyone knows, "theology" involves a "speaking-of-God," and this expression should be regarded very carefully, for its double meaning suggests the source of difficulty in understanding the theologian's craft: theology speaks *about* God (the objective genitive of the grammarians), but only because of "God's speaking" to man (the subjective genitive); it is the active presence of the Numinous in the work of theology that renders its task so strange to those who look upon it from the outside. But leaving aside (for the moment only!) the active numinosity in theological endeavor, and concentrating on the object of theological research, we can say very simply that the theologian[1] is one who engages in forming and testing theories concerning the Divine.

Our task in this paper is thus the clarification of what it properly means to form and to test theological theories; and it is hoped that the result will aid both the non-theologian (particularly the scientist) to under-

stand and to appreciate better the nature of theological endeavor, and the theologian himself to keep his methodological sights correctly focused. The center of attention will be neither the historical circumstances attending theological theorizing[2] nor the psychological factors relating to theological discovery[3] — interesting as these subjects are. We shall hold ourselves quite closely to the fundamental realm of theological prolegomena, and seek to discover the nature of the operations that make theology theology. As the reader enters the rarified air of this domain, he is warned to prepare himself for innovation and groundbreaking; it is the writer's conviction that precisely here lie the basic sources of error in much contemporary theological thinking, as well as the relatively untapped resources for theological recovery in our time.

Through a Welter of Confusion

Any attempt to get at the nature of theological theorizing runs the immediate danger of being bogged down in a morass of conflicting interpretations of theological activity. On the one hand, the student of the subject is faced with dogmatically simplistic and pejorative definitions, such as that by Princeton philosopher Walter Kaufmann:

> First, theology is of necessity denominational. Second, theology is essentially a defensive maneuver. Third, it is almost always time-bound and dated quickly.
> Theology is the systematic attempt to pour the newest wine into the old skins of a denomination.[4]

To which it may be replied: First, even if all theologians were members of denominations (which is not the case), this would not make theology "denominational" — any more than the (fallacious) assumption that all physicians are members of state medical societies would make medicine political. Secondly, the defense of the faith (technically: apologetics) is but one of the tasks of systematic theology, not the whole or even the center of it. Thirdly, one needs a firm criterion of obsolescence in order to assert that theology is "time-bound" — but the secularist is, *ex hypothesi*, in the worst possible position to establish such a criterion. Finally: to define theological theorizing à la Kaufmann one must gratuitously assume that its content (wine) is forever new and changing, that its interpretative categories (skins) are old and denominational, and that the theorizing process (the pouring) requires no special examination. None of these assumptions, however, is credible enough to warrant pursuing.

Alongside of simplistically objective definitions of theological activity, one encounters existentially subjective descriptions of the theologian's work. In his Cambridge University Stanton Lectures on "Theological Explanation," G. F. Woods asserts, in partial dependence on Tillich:

> The first sense of theological explanation is the ultimate personal being which is the real ground of the world. The second sense is the act of seeking an explanation of what is ultimate, both through our own efforts to make it plain and through its own endeavours to make itself plain to us. The third sense is the act of using ultimate personal being as an explanation of the world in which we live. These manifold acts of explanation take place on particular occasions and are markedly influenced by the circumstances of the day, particularly by the methods of explanation which happen to be dominant at the time. But, throughout the confused series of particular acts of explanation, there is the perpetual trend towards the use of explanatory terms derived from our own being. What we are is the source of all our methods of seeking to explain the actual world.[5]

Here one must unkindly lay stress on the author's phrase "the confused series of particular acts of explanation," for confusion does indeed reign in any theological enterprise where "our own (existential-ontological) being" constitutes the center of the stage. As Carnap showed the analytical nonsensicality of Heidegger's "non-being", so A. C. Garnett has pointed up the unverifiable nonsense involved in "being"-assertions as theological starting-points.[6]

A third major variety of metatheological explanation is illustrated in William Hordern's just-published book, *Speaking of God,* which endeavors to create a bridge between current "ordinary-language philosophy" and theology. Here Hordern, by an exceedingly unfortunate substitution of the later Wittgenstein for the earlier Wittgenstein, leaves the fundamental problem of theological verification aside and attempts to describe theology as a unique, sui-generis "language game":

> Instead of thinking of theology as the queen of the sciences, can we think of it as the Olympic Games? . . . The Olympic Committee does not legislate the rules of ice hockey, and much less does it train a hockey player how to play hockey. But ice hockey takes its place within the total pattern of the Olympics, and its players must meet the Olympic standard. . . .
> By analogy, natural science and other language games are separate and independent, with their own questions, rules, methods of verification, and ways of giving answers. . . . [The] Christian faith cannot answer scientific questions any more than the Olympic Committee can tell a hockey player how to shoot the puck. . . .
> Theology, as the Olympics of life. . . . does not pretend to be a superscientific system with answers to all questions left unanswered by science. It is concerned with another kind of question than is science. It does not offer a systematic explanation of the universe; it is a means whereby man is enabled to live his life with a sense of purpose, direction, and integrity.[7]

Such an approach places theology in a mystical cloud of unknowing, and lifts the Mt. Olympus of theology off of the earth entirely.[8] Since theology, in Hordern's view, "cannot answer scientific questions," its axiological ship passes in the night the cognitive vessel of the scientific disciplines, and neither can communicate with the other. Moreover, and most important, the theological "language game" is without external verification, so its theories do not have to be accepted as "Olympic rules" by anyone who is not theologically inclined. It is too bad that Hordern did not see the point behind Wittgenstein's concern that his *Tractatus Logico-Philosophicus* be published along with his *Philosophical Investigations*: the latter, without the former, provides no answer whatever to the fundamental question: how do you know if a "language game" (e.g., theological theorizing) represents reality at all?[9]

In light of fallaciously objectivistic, existentially subjectivistic, and etherially olympian descriptions of theological activity, is it any wonder that tongue-in-cheek humor not infrequently captures the special-pleading character of contemporary theological theorizing? The January 15, 1965, issue of *Christianity Today* carries Lawing's cartoon of Moses' return from Mt. Sinai with the Commandments; a sly Israelite meets him with the suggestion, "Aaron said perhaps you'd let us condense them to 'act responsibly in love'." Here Bishop Robinson's theological theory as to the "real" meaning of the Commandments is lampooned: the sick humor lies in the fact that the Israelite (probably) and Robinson (certainly) lack awareness of the degree to which cultural conformity and personal preference dictate the content of their theological constructions.

How can we gain clarity in this vital area? Let us, for the moment, step outside of the theological realm and examine the essential nature of theories by way of the discipline in which they have been most thoroughly discussed: the field of science. Here we can gain our bearings and find an immediate and meaningful entrée to the larger question of theological theory formation and testing.

Theory Construction in Science

Though there have been many theories as to the exact nature of scientific theories, a general convergence and agreement among them is not hard to find. Popper uses Wittgenstein's analogy of the Net: "Theories are nets cast to catch what we call 'the world': to rationalize, to explain, and to master it. We endeavor to make the mesh ever finer and finer."[10] Comments Leonard Nash of Harvard: "He who realizes the existence of such a conceptual fabric, and is capable of lifting it, carries with it all its cords, all the colligative relations it accomodates."[11] The use of an image (the net) to illustrate the nature of scientific theory construction points to an especially vital element in such theories: the employment of "models" – representations that carry "epistemological vividness."[12] So, in speaking of the discovery that "light travels in straight lines," Stephen Toulmin notes that "a vital part of the discovery is the very possibility of drawing 'pictures' of the optical state-of-affairs to be expected in given circumstances – or rather, the possibility of drawing them in a way that *fits the facts*."[13]

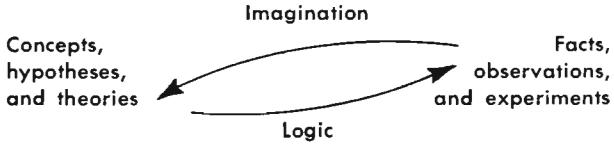
To concretize these abstract remarks on scientific theorizing, let us consider a dramatic and very recent case of successful theory-building: the 1962 Nobel Prize discovery, by James Watson and Francis Crick, of the molecular structure of DNA (the nucleic acid bearing the blueprint of heredity).

> Watson was convinced by reasons based upon genetics that [the] structure could only be built around two spirals arranged "in a certain way." The answer lay in this "certain way."
>
> The only way of representing the three-dimensional structure of an invisible molecule is to replace atoms or groups of atoms by spheres and then build a model of the molecule.
>
> This is exactly what Crick and Watson did, tirelessly attempting to arrange the two spirals. To quote the expression used by one of them, all of their models were "frightful", and quite inadequate to cope with DNA's known qualities ("You couldn't hang anything on these spirals"). . . .
>
> Then came the famous "spiral night." Crick was working late in a laboratory upstairs. On the ground floor, Watson also was going over a list of possible solutions. That night Crick had a revelation, a solution whispered to him by his intuition: there were only two spirals, they were symmetrical, and they coiled in opposite directions, one from "top to bottom" and the other from "bottom to top" (this hypothesis also reflected certain laws of crystallography).
>
> Crick raced downstairs – it was a spiral staircase – and enthusiastically explained his theory to Watson. Watson received it calmly: it sounded simple to him, much too simple. Then, mentally, he built a spiral form based on this idea, and all the various chemical, biological and physical requirements he put forward were met by it. Now he too was excited; he paced up and down the laboratory, repeating: "It must be true, it must be true."[14]

This lively description of the key point[15] in the discovery of DNA's molecular structure drives home several basic truths about scientific theorizing – truths expressed formally in the definitions previously cited. First, theories do not create facts; rather, they attempt to relate existent facts properly. The DNA molecular model is a "net" thrown to catch the "world" of "chemical, biological and physical requirements" demanded by empirical facticity. The theory maker must never suppose that he is building reality; his task is the fascinating but more humble one of shaping a "conceptual fabric" that, with "epistemological vividness," will correctly mirror the world of substantive reality.[16]

The DNA discovery illustrates, moreover, that theories in science are not formed "either by deductive argument from the experimental data alone, or by the type of logic-book 'induction' on which philosophers have so often concentrated, or indeed by any method for which formal rules could be given."[17] Writers such as Braithwaite have effectively argued the case for the indispensable role of deductive reasoning in scientific explanation; but Braithwaite's concluding paragraphs stress the inductivist side of the coin: "Man proposes a system of hypotheses: Nature disposes of its truth or falsity. Man invents a scientific system, and then discovers whether or not it accords with observed fact."[18] G. H. Von Wright has logically demonstrated that "if we wish to call reasoned policies *better* than not-reasoned ones, it follows . . . that induction is of necessity the *best* way";[19] yet the appealing ghost of Francis Bacon's pure inductivism in science has been laid by such philisophers of science as Joseph Agassi,[20] and as the history of scientific discovery shows beyond question, the great advances in theory have not arisen through static, formalistic induction.[21] Rather than making invidious comparisons beween deduction and induction in scientific theory formation, we should see these operations as complementary.[22] Instead of seeking monolithic explanation of scientific method, let us, with Max Black, "think of science as a concrescence, a growing together of variable, interacting, mutually reinforcing factors contributing to a development organic in character."[23] Nash provides the follow-

ing helpful diagram, illustrating how scientific knowledge is generated by endless cyclical renewal;[24]



The essential place of "imagination" in scientific theorizing has been greatly stressed by Einstein; and its role can perhaps best be seen by introducing, alongside induction and deduction – as, in fact, the connecting link between them—Peirce's concept of "retroduction" or "abduction", based upon Aristotle's ἀπαγωγή - type inference.[25] "Abduction", writes Peirce, "consists in studying facts and devising a theory to explain them . . . . Deduction proves that something *must* be; Induction shows that something *actually is* operative; Abduction merely suggests that something *may be*."[26] N. R. Hanson has well illustrated the centrality of such "retroductive" reasoning to scientific theorizing; consider Hanson's ambiguous "bird-antelope":

Were this flashed on to a screen I might say "It has four feathers". I may be wrong: that the number of wiggly lines on the figure is other than four is a conceptual possibility. "It has four feathers" is thus falsifiable, empirical. It is an observation statement. To determine its truth we need only put the figure on the screen again and count the lines.

The statement that the figure is of a bird, however, is not falsifiable in the same sense. Its negation does not represent the same conceptual possibility, for it concerns not an observational detail but the very pattern which makes those details intelligible. One could not even say "It has four feathers" and be wrong about it, if it was not a feathered object. I can show you your error if you say "four feathers". But I cannot thus disclose your "error" in saying of the bird-antelope that it is a bird (instead of an antelope).

Pattern statements are different from detail statements. They are not inductive summaries of detail statements. Still the statement, "It's a bird" is truly empirical. Had birds been different, or had the bird-antelope been drawn differently, "It's a bird" might not have been true. In some sense it is true. If the detail statements are empirical, the pattern statements which give them sense are also empirical – though not in the same way. To deny a detail statement is to do something within the pattern. To deny a pattern statement is to attack the conceptual framework itself, and this denial cannot function in the same way. . . .

Physical theories provide patterns within which data appear intelligible. They constitute a "conceptual Gestalt". A theory is not pieced together from observed phenomena; it is rather what makes it possible to observe phenomena as being of a certain sort, and as related to other phenomena. Theories put phenomena into systems. They are built up "in reverse" – retroductively. A theory is a cluster of conclusions in search of a premise. From the observed properties of phenomena the physicist reasons his way towards a keystone idea from which the properties are explicable as a matter of course.[27]

Watson and Crick's discovery of the molecular structure of DNA clearly displays the centrality of retroductive inference in scientific theory formation: they sought a "conceptual Gestalt" which would render intelligible the genetic and crystallographic data; and their resultant theory of two symmetrical spirals was successful precisely because it constituted a "keystone idea" from which the various physical, chemical, and biological characteristics of the molecule were "explicable as a matter of course."

It is particularly important to note that the validity of a scientific theory depends squarely upon its applicability as a "conceptual Gestalt"; experimental confirmation through predictive success is of secondary importance and is often, of necessity, dispensed with entirely. In paleobiology, for example, experimental prediction is ruled out by the very nature of the subject matter; and in astrophysics and cosmological theory predictive experiments are seldom able to be formulated. Watson could say of the DNA spiral theory. "It must be true," though several years would elapse before X-ray diffraction patterns of the molecule would become available, for his theory provided a full-scale ordering of the relevant data.

Galileo knew he had succeeded when the constant acceleration hypothesis patterned the diverse phenomena he had encountered for thirty years. His reasoned advance from insight to insight culminated in an ultimate physical *explicans*. Further deductions were merely confirmatory; he could have left them to any of his students – Viviani or Toricelli. Even had verification of these further predictions eluded seventeenth-century science, this would not have prevented Galileo from embracing the constant acceleration hypothesis, any more than Copernicus and Kepler were prevented from embracing heliocentrism by the lack of a telescope with which to observe Venus' phases. Kepler needed no new observations to realize that the ellipse covered all observed positions. Newton required no predictions from his gravitation hypothesis to be confident that this really did explain Kepler's three laws and a variety of other given data.[28]

The Scientific Level in Theological Theorizing

We have found that scientific theories are conceptual Gestalts, built up retroductively through imaginative attempts to render phenomena intelligible. What relevance does this have for understanding the theologian's labors? Can any application be made to the field of theology? Is not theology a unique realm of the "spirit", unscientific by its very nature? To bring Tertullian's famous question up to date: "What has the Institute of Advanced Study to do with Jerusalem, the Laboratory with the Church?"

The answer to this last question is not "Nothing", but "Everything". Though theology is evidently something *more* than science (precisely what the "more" consists of, we shall see later), it is certainly not anything *less*. I say this, let it be noted, not simply in reference to the fact that any theology can be an object of descriptive, scientific study by specialists in the history, philosophy, or psychology of religion.[29] This is of course true in the case of all the world religions; but Christianity is unique in claiming intrinsic, not merely extrinsic, connection

with the empirical reality which is the subject of scientific investigation. Christianity is a *historical* religion – historical in the very special sense that its entire revelational content is wedded to historical manifestations of Divine power. The pivot of Christian theology is the biblical affirmation that ὁ Λόγος σὰρξ ἐγένετο (Jn. 1:14): God Himself came to earth – entered man's empirical sphere – in Jesus Christ, and the revelation of God in the history of Israel served as a pointer to Messiah's coming, and His revelation in the Apostolic community displayed the power of Christ's Spirit.[30] From the first verse of the Bible to the last God's *contact* with man's world is affirmed. And throughout Scripture human testimony to objective, empirical encounter with God is presented in the strongest terms.[31] Christian theology thus has no fear of scientific, empirical investigation;[32] quite the contrary, the historical nature of the Christian faith – as distinguished from the subjective, existential character of the other world religions[33] – demands objective, scientific theologizing.

Hence we should expect, Barth notwithstanding,[34] that theological theories whatever suprascientific characteristics they may have, will most definitely display the full range of properties of scientific theories. The theological theorist, like his scientific counterpart, will endeavor to formulate conceptual Gestalts – "networks" of ideas capable of rendering his data intelligible. He will employ "models" to achieve epistemological vividness. He will utilize all three types of inference (inductive, deductive, retroductive) in his theory making, but, again like the scientist, he will find himself most usually dependent upon the imaginative operation of retroduction. Little more than superficial naiveté lies at the basis of the popular opinion that science and theology are in methodological conflict because the former "employs inductive reasoning" while the latter "operates deductively"! In point of fact, both generally proceed retroductively, and neither is less concerned than the other about the concrete verification of its inferences.

And how does verification take place? In science we have seen that the success of a theory depends upon its ability, as Toulmin says, to "fit the facts." The same is true in theology. Ian Ramsey – though he does not see that theology exactly parallels science here – introduces a valuable analogy when he writes that "the theological model works . . . like the fitting of a boot or a shoe."

> In other words, we have a particular doctrine which, like a preferred and selected shoe, starts by appearing to meet our empirical needs. But on closer fitting to the phenomena the shoe may pinch. When tested against future slush and rain it may be proven to be not altogether watertight or it may be comfortable – yet it must not be too comfortable. In this way, the test of a shoe is measured by its ability to match a wide range of phenomena, by its overall success in meeting a variety of needs. Here is what I might call the method of empirical fit which is displayed by theological theorizing.[35]

This is precisely the verifying test that we have encountered in our discussion of scientific theories; the Watson-Crick spiral theory was just such a "shoe" whose adequacy depended squarely upon its ability to "fit" the relevant physical, chemical, and biological characteristics of the DNA molecule. Neither Watson and Crick, nor the great scientific theorists of past ages (we have already referred to Galileo, Copernicus, Kepler, and Newton) achieved their primary success in theory construction through the predictive character of their formulations; both in science and in theology, it is "fit", not "future", that lies at the heart of successful theorizing.[36]

But clearly scientific and theological theories are not identical! Where do the differences lie? One important difference (we leave others until later) is pointed up by Ramsey's "shoe" analogy. This analogy immediately raises two basic questions about theorizing: first and most obvious, How do you make the shoe (the theory or model)? but second, and even more fundamental, What foot (data) do you try to fit? In science, the "foot" – the irreducible stuff which theorizing attempts to grasp in its net – is the natural world, and this includes every phenomenal manifestation in the universe. Science knows no investigative boundaries; its limits are imposed not by the stuff with which it is permitted to deal, but by the manner in which it can treat its data. *Ex hypothesi*, science is methodologically capable of studying the world in an *objective* manner only: it can examine anything that touches human experience, but it can never, qua science, "get inside" its subject matter; it always stands outside and describes. This is, of course, both the glory and the pathos of science: it can analyze everything, but it is prevented from experiencing the heart of anything.

On the objective, scientific level, however, theology has no greater advantage; it likewise stands outside its data and analyzes. But what precisely does it analyze? What are the *Gegenstände* of theological theorizing – the "simples" that the theologian attempts to render intelligible through his conceptual Gestalts? In general, for Christian theology, the "foot to be shod" is revelational experience. Theological theories endeavor to "fit the facts" of such experience; theology on this level is thus one segment of scientific activity as a whole – that segment concerned with revelational, as opposed to non-revelational, phenomena. Jean Racette, in dependence upon the great contemporary Jesuit philosopher-theologian Bernard Lonergan, puts it succinctly and well:

> La théologie n'est pas une science ou une sagesse quelconque. Elle est la science du sacré et du révélé. Elle est une démarche de l'intelligence éclairée par la foi. Elle est une réflexion systématique sur un donné reconnu et accepté comme révélé, et donc comme vrai.[37]

However, the expression "revelational experience" is manifestly ambiguous. What does it signify? This question, without a doubt, is of paramount importance for the entire theological task, since a false step here

will tragically weaken the entire process of theological theorizing – either by emasculation (if one excludes from purview genuine revelational data), or by adulteration (if one mixes non-revelational considerations with the truly revelational subject matter). And, ironically, it is exactly at this point that Christian theology has all too often trumpeted forth an uncertain sound – or, worse, a positive discord! To change the metaphor, the theologian has not infrequently played the role of a blind cobbler, trying to make shoes without knowing what kind of foot he is shoeing; at other times, he appears as a bungling apprentice, busily preparing what should be dainty slippers for Queen Revelation when in fact he is putting together clod-hoppers to fit the Lumberjack U. (for Unregenerate) Religiosity!

Through Christian history, the "revelational experience" which yields the proper data for theological theorizing has been understood as having either a *single* source or *multiple* sources. Traditional multiple source positions include Roman Catholicism, Greek Orthodoxy, and Anglo-Catholicism (all holding that the Bible and church tradition constitute valid revelational sources), and various sects having sacred books which they use alongside of the Bible as sources of data for theologizing (e.g., Mormonism, with its *Book of Mormon;* Christian Science, with Mrs. Eddy's *Science and Health*). Multiple source approaches also constitute the epistemological core of most avant-garde mainline Protestant theological positions today: a combination of biblical insight, church teaching, and personal religious experience is supposed to provide the fund from which systematic theology should draw its data for doctrinal theorizing. For Paul Tillich, the "survey of the sources of systematic theology has shown their almost unlimited richness: Bible, church history, history of religion and culture."[38] For advocates of the post-Bultmannian "New Hermeneutic" (such as Ernst Fuchs and Gerhard Ebeling), systematic theology has as its subject matter "the word event itself, in which the reality of man comes true," and by "word event" is meant "the event of interpretation";[39] thus theology has its source in a polar dialectic of biblical text and situational interpretation. Heinrich Ott, for all his differences with Fuchs, expresses essentially the same dual-source, dialectic approach when he finds the subject matter of theology in "the Christ event, the reality of revelation and of believing"[40] and proposes that "dogmatics is simply to unfold thoughtfully without presupposing any philosophical schema the meaning-content experienced in believing from within the experience itself",[41] systematic theology thus serves as a "hermeneutical arch that reaches from the text to the contemporary sermon."[42]

All multiple-source views of the subject matter of theology are, however, unstable. They tend to give preference to one source rather than to another, or to seek some single, more fundamental source lying behind the multiple sources already accepted. Among the sects, the Bible has been virtually swallowed up by whatever special "sacred book" has been put alongside of it;[43] tradition has been more determinative than biblical teaching in the theological development of Greek Orthodoxy and Roman Catholicism; and the "New Hermeneutic" seems incapable of withstanding the old Bultmannian gravitational pull away from the biblical text toward the other dialectic pole of contemporary existential interpretation. In the "New Shape" Roman Catholicism of Karl Rahner, Küng, *et al.*, a conscious attempt is being made to get behind the dualism of scripture and tradition through affirming a unity of "Holy Writ *and* Holy Church";[44] yet such a dialectic, like that of the Protestant "New Hermeneutic," does not escape the charge of question-begging. This is the essential, insurmountable difficulty in all multiple-source approaches to theological theorizing: They leave unanswered the question of *final* authority. What do we do as Roman Catholics when Holy Writ and Holy Church *disagree?* What do we do as Tillichians when church history, the Bible, and the history of culture are not in accord? Obviously, one must either frankly admit that one source is final, or establish a criterion of judgment over all previously accepted sources – which criterion becomes, *ex hypothesi*, the final source! Multiple source approaches to the subject matter of theology thus logically – whether one likes it or not – reduce to single source interpretations.[45]

If theology must ultimately admit that there is but a single "foot" which its doctrinal theories are to fit, the question becomes one of identifying that foot. The numerous identifications through Christian history contract upon examination, to four: Reason, the Church, Christian Experience, and Scriptural Revelation. During the eighteenth-century "Enlightenment" it was contended that the "natural light of Reason," not any alleged sacred writing or "special revelation," constitutes the final source of valid theological data.[46] Unhappily, however, pure reason (i.e., formal logic) is tautologous and cannot impart any factual data about existent things, whether theological or otherwise;[47] and "reason" understood as "nature" can yield atheistic ideologies almost as easily as deistic theologies.[48] In Romanism, the Church becomes the court of last resort for determining what are or what are not genuine data for theologizing. But the argument that this is necessary because even an infallible Bible requires an infallible interpreter suffers from the fallacy of infinite regress; one can always ask, Then how can the Church itself function without a higher-level interpreter? Moreover, no Divine mandate can be produced to justify the authority of the Church as interpreter of Scripture.[49]

Christian Experience is the most widely accepted Protestant answer to the question of the source of data for theological theorizing. For the unreconstructed Modernism of the Schleiermacher-Ritschl-Fosdick era, "constructive (i.e., subjective) religious empiricism" was expected to yield doctrinal reconstructions in accord with the needs of contemporary man. As a

matter of fact, however, such a methodology yielded only the results permitted by the experiential a prioris of the particular theological investigator.[50] Bultmannian existentialism and the post-Bultmannian theologies stemming from his paramount concern with "existential self-understanding"[51] are actually "experience" theologies also: for them the current situation of the theologian, not an objectively unchanging biblical message, is the determinative factor in theological activity. In the same general class fall many of the recent attempts to interrelate theology and "ordinary language philosophy": Ramsey's concern with theological theories in relation to "our empirical needs";[52] Hick's interpretation of theological dogmas as "the basic convictions which directly transcribe Christian experience";[53] etc.

The absolutizing of religious experience commits the "naturalistic fallacy (sometimes unkindly called the "sociologist's fallacy"): it assumes that the "isness" of the believer's "existential encounter" constitutes an "oughtness". No answer whatever is given to the vital question: How is one to know that the divine and not the demonic is operating in the given experience? Paul Tillich argues with irrefutable cogency that "insight into the human situation destroys every theology which makes experience an independent source instead of a dependent medium of systematic theology."[54] Surely the psychoanalytic discoveries of the twentieth century should give us pause before we commit ourselves to the transparent purity of man's existential life!

> The analogy from human "encounters" suggests that at least some of the experiences which are held to be "encounter with God" really are subjectively produced; can be the mere claim that the experiences are "self-verifying" rule out the uncomfortable suspicion that, when dissociated from any empirical personality, they all may be only illusion?[55]

What is clearly needed is an objective check on existential experience – in other words, a source of theological data outside of it, by which to judge it.[56]

Thus we arrive at the Bible[57] – the source by which Reason, Church, and Religious Experience can and must be evaluated theologically. We reach this point not simply by process of elimination, but more especially because only Scripture can be validated as a genuine source of theological truth.[58] It is the biblical message alone that provides the irreducible *Gegenstände* for theological theorizing – the "foot" which all theological theories must "fit". In the words of the Reformation axiom, "Quod non est biblicum, non est theologicum." The Christian theologian, like the scientist, faces a "given"; he endeavors, not to create his data, but to provide conceptual Gestalts for rendering them intelligible and interrelating them properly. What Nature is to the scientific theorizer, the Bible is to the theologian. Franz Pieper astutely argued this parallel as follows:

> If we would escape the deceptions which are involved in the attempts to construct a human system of theology, we must ever bear in mind that in theology we deal with given and unalterable facts, which human reasoning and the alleged needs of the "system" cannot change in the least. There is, as has been pointed out, an analogy here between natural history and theology. Natural history studies the observable data in the realm of nature; its business is to observe the facts. All human knowledge of natural phenomena extends only so far as man's observation and experience of the given facts extends. The true scientist does not determine the nature and characteristics of plants and animals according to a preconceived and hypothetical system. . . .
>
> This matter has been aptly illustrated by contrasting railroad systems and mountain systems. A railroad system is conceived in the mind of the builders before it exists; its construction follows the blueprint drawn up by the engineers. The mountain system, on the other hand, does not follow our blueprints. We can only report our findings regarding its characteristics, the relation of the different mountain ranges to each other, etc., as we find them. The theologian is dealing with a fixed and unchangeable fact, the Word of God which Christ gave His Church through His Apostles and Prophets.[59]

To be sure, the affirmation that Holy Scripture is the sole source of data for theological theorizing poses questions requiring serious attention. Specifically: (1) Is the Bible an inerrantly reliable source of revelational data? (2) Is the Bible self-interpreting? (3) Does the Bible provide the norms as well as the subject matter for theological theory construction? We cannot hope to discuss any one of these questions fully here, but we can indicate the central considerations which demand affirmative answers in each case.

In a recently published paper,[60] I have attempted to show that any view of biblical inspiration that rejects the inerrancy of Scripture is not merely incorrect, but in fact *meaningless* from the standpoint both of philosophical and of theological analysis. Anti-inerrancy inspiration positions are based upon dualistic and existentialistic presuppositions that are incapable of being confirmed or disconfirmed (thus their analytically meaningless character), and they fly directly in the face of the scriptural epistemology itself, which firmly joins "spiritual" truth to historical, empirical facticity and regards *all* words spoken by inspiration of God as carrying their Author's guarantee of veracity. Moreover, if in some sense Scripture were not unqualifiedly a reliable source of theological truth, what criteria could possibly distinguish the wheat from the chaff? Not the Scripture itself (by definition), and not anything outside of it (for the "outside" factors would then become revelation, and we have already seen that extra-biblical revelation-claims are incapable of validation)!

This latter point also applies to the question of the self-interpreting nature of the Bible: Were the Scripture not self-interpreting, then a "higher" revelation would be needed to provide interpretative canons for it; but such a Bible-to-the-second-power cannot be shown to exist. And, indeed, there is no reason to feel that one should exist. If God inspired the Scripture, then its self-interpreting perspicuity is established. The Reformers soundly argued that "the clarity of Scripture is demanded by its inspiration. God is able to speak clearly, for He is the master of language and words."[61] True, "there are many impenetrable mysteries in Scripture

which are unclear in that they cannot be grasped by human intellect, but these mysteries have been recorded in Scripture in obscure or ambiguous language."[62] Present-day specialists in biblical hermeneutics who have been trained in general literary interpretation make every effort to impress upon their students and readers that the Bible must be approached objectively and allowed to interpret itself. Thus Robert Traina writes in the Introduction to his superlative manual, *Methodical Bible Study: A New Approach to Hermeneutics*:

> Now the Scriptures are distinct from the interpreter and are not an integral part of him. If the truths of the Bible already resided in man, there would be no need for the Bible and this manual would be superfluous. But the fact is that *the Bible is an objective body of literature* which exists because man needs to know certain truths which he himself cannot know and which must come to him from without. Consequently, if he is to discover the truths which reside in this objective body of literature, he must utilize an approach which corresponds in nature with it, that is, an *objective* approach.[63]

Such an hermeneutic approach has been explicitly adopted by the great systematic theologians, past[64] and present,[65] and *must* be presupposed in theological theorizing if one is to avoid exegeting and systematizing one's own subjective opinions and desires instead of God's Word. The "circularity principle" of Bultmann and his former disciples[66] gives carte blanche to this latter error and invariably destroys the possibility of sound theological theorizing; as I have written elsewhere:

> When Bultmann argues that not only historical method but also existential "life-relation" must be presupposed in exegesis, he blurs the aim of objectivity which is essential to all proper literary and historical study. Following Dilthey as well as the general stream of philosophical existentialism, Bultmann attempts to "cut under the subject-object distinction"; he claims that "for historical understanding, the schema of subject and object that has validity for natural science is invalid." But in fact the subject-object distinction is of crucial importance in history as well as in natural science, and only by aiming to discover the objective concern of the text (rather than blending it with the subjective concern of the exegete) can successful exegesis take place.[67]

But does the Bible *per se* yield the norms, or only the subject matter, for theological theorizing? Not only from existentially orientated Bultmannians and post-Bultmannian advocates of the "New Hermeneutic," but also from Paul Tillich, who has valiantly endeavored to stiffen theological existentialism by means of ontology, we receive the negative reply that Scripture cannot in itself supply absolute norms for theological construction. After noting the variety of norms employed through church history for imparting significance levels to biblical data, Tillich asserts: "The Bible as such has never been the norm of systematic theology. The norm has been a principle derived from the Bible in an encounter between Bible and church.[68] Now we readily grant that church history presents a number of different normative approaches to Holy Writ: the early Greek church's stress on the Logos as the light shining in the darkness of man's mortality,[69] the sacramental Christology of the Western church in the Middle Ages, the Reformation emphasis on God's gracious forgiveness of sin, Protestant Modernism's concern with social amelioration, Tillich's own concentration on Christ as the New Being, etc. But are we, à la Tillich, to commit the naturalistic fallacy and assume that because varied judgments on the norm of biblical theology *have* existed, they *should* have existed? or that the various historical judgments on the norm have been equally valid, simply because they have met the needs of the time? or that Scripture does not in fact provide its own absolute norms for unifying its content? Tillich's dialectic "encounter between Bible and church" as the souce of norms inevitably degenerates to historical relativism, leaving his own norm without justification along with the others.

In point of fact, one can readily detect unsound theological norms (e.g., Modernism's "social gospel") by virtue of their inability to give biblical force to central scriptural teachings, and by their unwarranted elevation of secondary (or even unbiblical) emphases to primary position. In other words, Scripture *does* very definitely supply "weighting factors" for its own teachings. Moreover, the majority of norms displayed in the history of orthodox theology have not really been as divergent as Tillich's discussion implies: most often they have displayed complementary facets of the overarching biblical message that "God was in Christ, reconciling the world unto Himself." Scripture itself makes this Christocentric teaching primary and ranges its other teachings in objective relation to it; and a sinful church learns the fact not through its historical "encounters" (which are always tainted), but from the perspicuous text of Holy Writ. Only Scripture is capable of truly interpreting Scripture; and only Scripture is able to provide the norm-structure for its interpretation and for the construction of theological doctrine based upon its inerrantly inspired content.

Terminating, then, our discussion of the scientific level of theological theorizing, we must reaffirm the fundamental thesis for which proof has been marshalled *in extenso*: science and theology form and test their respective theories in the same way; the scientific theorizer attempts objectively to formulate conceptual Gestalts (hypotheses, theories, laws) capable of rendering Nature intelligible, and the theologian endeavors to provide conceptual Gestalts (doctrines, dogmas)[70] which will "fit the facts" and properly reflect the norms of Holy Scripture. A tabular summary will perhaps offer the best conclusion to the rather involved discussion preceding it, as well as the best background for what is to follow.

	SCIENCE	THEOLOGY
THE DATA (Epistemological certainty presupposed	Nature	The Bible
CONCEPTUAL GESTALTS	Laws	Ecumenical Creeds (e.g., the Apostles' Creed) and historic Confessions (e.g., the Augsburg Confession)
(In order of decreasing certainty)[71]	Theories	Theological systems (e.g., Calvin's *Institutes*)
	Hypotheses	Theological proposals (e.g., Gustaf Aulén's *Christus Victor*)[72]

The Artistic and Sacral Levels in Theological Theorizing

A recent article describing the sorry Spiritualist phase at the end of Sir Arthur Conan Doyle's distinguished career concludes with this thought-provoking evaluation:

> He was ill suited by personal temperament and life experience to become a religious philosopher. His natural sympathies were located in the outer rather than the inner life of man, as seen in his power to describe actions in his literature and his failure to portray character. Thus he was continually drawn towards the appearance of an event, its overt significance, but denied the ability to perceive its inner meaning.[73]

Leaving aside the disputable point (to which no addict of Sherlock Holmes could possibly agree!) that Doyle was a poor delineator of character, one finds here an exceedingly important reminder that the theological realm requires something more of investigators than scientific objectivity alone: it demands "the ability to perceive inner meaning." What is involved in this "inner meaning," and what connection does it have with theological theorizing?

A powerful hint toward an answer is provided in Luther's description of his theological method, which he characteristically drew from Scripture itself:

> Let me show you a right method for studying theology, the one that I have used. If you adopt it, you will become so learned that if it were necessary, you yourself would be qualified to produce books just as good as those of the Fathers and the church councils. Even as I dare to be so bold in God as to pride myself, without arrogance or lying, as not being greatly behind some of the Fathers in the matter of making books; as to my life, I am far from being their equal. This method is the one which the pious king David teaches in the 119th Psalm and which, no doubt, was practiced by all the Patriarchs and Prophets. In the 119th Psalm you will find three rules which are abundantly expounded throughout the entire Psalm. They are called: *Oratio, Meditatio, Tentatio.*[74]

By *Meditatio,* Luther meant the reading, study, and contemplation of the Bible (i.e., very much what we have spoken of in our foregoing discussion of the objective aspect of theological methodolgy); by *Tentatio,* he meant internal and external temptation – what we today would doubtless call subjective, experiential involvement; and by *Oratio* ("prayer"), the vertical contact with the Holy One, without which all theologizing is ultimately futile. Much the same threefold approach to theology is suggested by the treatment of the concept of faith in classical Protestant orthodoxy: faith involves *Notitia* ("knowledge" – the objective, scientific element), *Assensus* ("assent" – the subjective element), and *Fiducia* ("trust/confidence" – the vertical, regenerating relation with the Living God).[75] Quenstedt grounds this analysis of faith in John 14:10-12. He notes that "heretics can have the first, the second the orthodox alone, the third the regenerate; and therefore the latter always includes the former, but this order cannot be reversed."[76] Theology, like the faith to which it gives systematic expression, has objective, subjective, and divine levels, no one of which can be disregarded. Having discussed the scientific base in theological theorizing, let us now focus attention on the second, or artistic, level of theological activity.

The Theologian As Artist. John Ciardi, in his excellent introduction to literary criticism, *How Does a Poem Mean?*, quotes the following passage from Dickens' *Hard Times*:

> "Bitzer," said Thomas Gradgrind, "your definition of a horse."
>
> "Quadruped. Gramnivorous. Forty teeth, namely twenty-four grinders, four eye-teeth, and twelve incisive. Sheds coat in the spring; in marshy countries sheds hoofs too. Hoofs hard, but requiring to be shod with iron. Age known by marks in mouth." Thus (and much more) Bitzer.
>
> "Now girl number twenty," said Mr. Gradgrind, "you know what a horse is."

Ciardi quite rightly points out that, after having heard this learned description, "girl number twenty" knew "what a horse is" only in a very special and limited way: she knew horses in a formal, objective, scientific manner, but not at all in a personal, experiential way – not in the way in which a poet or an artist endeavors to convey knowledge. In the same vein, Peter Winch argues for the legitimate, and indeed necessary, inclusion of subjective involvement in the work of the social scientist; over against psychological behaviorism he asks the rhetorical question: "Would it be intelligent to try to explain how Romeo's love for Juliet enters into his behaviour in the same terms as we might want to apply to the rat whose sexual excitement makes him run across an electrically charged grid to reach his mate?"[77] Theorizing in the humanities or social sciences requires more than scientific objectivity; it also demands "the language of experience"[78] – "grasping the *point* or *meaning* of what is being done or said."[79]

Is this also true of theology? We have justified the

scientific character of theological theorizing by pointing to the empirical, objective nature of God's historical revelation in Holy Scripture; now we must make the equally important point that, by virtue of its historical character, the biblical revelation lies also in the realm of the social sciences and humanities. Because God revealed Himself in history, and the Bible—the source of all true theological Gestalts – is a historical document, theological theories must partake of the dual science-art character of historical methodology. The historian cannot stop with an external, objective examination of facts and records; as Benedetto Croce and R. G. Collingwood have so well shown, he must relive the past in imagination – re-enact it by entering into its very heart.[80] As Jakob Burckhardt's *Civilization of the Renaissance in Italy* and Johan Huizinga's *Waning of the Middle Ages* magnificently delineate their respective historical epochs by cutting to the essence of them, so theological constructions must meet Ernst Cassirer's standard for every "science of culture": they must teach us "to interpret symbols in order to decipher their latent meaning, to make visible again the life from which they originally came into being.[81]

We cannot enter here into the problem of the logical status of subjective artistic assertions;[82] suffice it to say, as has been effectively shown by Ian Ramsey and others, that such judgments follow from the independent, irreducible nature of the "I", which is in fact presupposed in all statements about the world – including scientific statements.[83] What we do wish to emphasize is the necessity of incorporating the artistic element into all theological theories, in order to avoid a depersonalization of theology and the concomitant freezing of biblical doctrine. Concretely, all valid theological theories must be set within the "invisible quotation marks" of belief,[84] must represent the personal, inner involvement of the theologian with Holy Scripture, and must convey a genuine reliving and re-enactment historical revelation.

The presence or absence of such artistic criteria as these is to be determined not by formulae, but by individual sensitivity on the part of theologian and Christian believer. Yet the artistic factor is no less real because of that. Just as a sensitive social scientist can recognize the greatness of William James' *Varieties of Religious Experience* as compared with pedestrian monographs on the same subject, and the sensitive literary critic has no doubt as to Milton's stature among epic poets, so the Christian who is in tune with Scripture can readily distinguish between theological theorizing that cuts to the heart of biblical revelation and theological theories that (scientifically correct as they may be) operate on a superficial level. Luther's insistence in presenting the doctrine of the Fall of man that "you should read the story of the Fall as if it happened yesterday, and to you" has this requisite inner quality,[85] as does such a creedal statement as the following, extracted from Johann Valentin Andreae's *Christianopolis* of 1619:

Credimus toto corde in Iesum Christum,[86] Dei & Mariae filium, coaequalem patrri, consimilem nobis, Redemptorem, duabus naturis personaliter unitum & utrisque communicatem, Prophetam, Regem, & Sacerdotem nostrum, cujus lex gratia, cujus sceptrum pacis, cujus crucis est sacr(i)ficium.	We believe with our whole heart in Jesus Christ, the Son of God and Mary, coequal with the Father yet like us, our Redeemer, united as to personality in two natures and communicating in both, our Prophet, King, and Priest, whose law is grace, whose scepter is that of peace, whose sacrifice, that of the cross.[87]

The Theologian and the Holy. In common with science, theology formulates its theories with a view to the objective fitting of facts (in this case, the facts of Scripture); in common with the arts, theology seeks by its theoretical formulations to enter personally into the heart of reality (God's revelation in the Bible). But theology is more than science or art, for it possesses a dimension unique to itself: the realm of the Holy. By this expression we do not refer merely to the "Numinous" quality of religion as analyzed by Rudolf Otto in his epochal work, *The Idea of the Holy;* we refer specifically to the unfathomable nature of the God of Scripture, whose ways are not our ways and whose thoughts are not our thoughts (Is. 55:8), and who demands of the theologian as of Moses, "Draw not nigh hither: put off thy shoes from off thy feet, for the place whereon thou standest is holy ground" (Ex. 3:5; cf. Acts 7:33). Lack of recognition of the distance between sinful man and sinless God or blindness to the absolute necessity of relying upon His Holy Spirit in theologizing will vitiate efforts in this realm, even though the scientific and artist requirements are fully met. Without *Fiducia, Notitia* and *Assensus* are like sounding brass and tinkling cymbal. O. K. Bouwsma makes this point well in his unpublished allegory, "Adventure in Verification," where his hero encounters difficulties in determining how Zeus makes Olympus quake:

> At a meeting of the P.L.B., the Pan-Hellenic Learning Bust, an annual affair at which the feasters eat each other's work, he confided to fellow-ravishers that at the time he was considering his confrontation with the Makers of Fact or the News, on Mt. Olympus, the difficulty that bothered him most was not the matter of protocol but that of language. It wasn't that, as he anticipated, they, the interviewed divinities, would not understand him – they are adept in understanding four-hundred and twenty-six languages – but that he would not understand them. . . .
>
> He went down the mountain disappointed. . . . When he got home he wrote an account of his adventure, in order that the future of verification might not lose the benefit of his effort. His own adventure he described as one of weak verification due to sand, quicksand, too quick for the hour-glass. It never occurred to him that, not quick sand, but vanity was the condition which led to his having his eyes fixed on his own good name in the bark of the tree when they should have been fixed on Zeus who made Great Olympus shake, not by waving his ambrosial locks, nor by stamping his foot, nor by a crow-bar, nor by a cough but in his own sweet way.[88]

How many theological theorizers have failed in their herculean labors as a result of vanity – as a result of fixing their eyes on themselves "when they should have been fixed on Zeus who made Great Olympus shake"!

In what way is the dimension of the "Sacred" conveyed in theological theory construction? Essentially, by the

admission that (in Bouwsma's phrase) we do not fully understand Zeus' language. That is to say, the theological theorist must always indicate in the statement of his doctrines the limited character of them – the fact that ultimately God works "in his own sweet way" (in the double sense of the phrase!). Michael Foster, by his stress on the irreducible mystery in all sound theological judgments,[89] and Willam Zuurdeeg, with his emphasis on the "convictional" nature of theological assertions,[90] endeavor (albeit by overemphasizing a good thing) to drive this point home. The best analysis of the problem, however, comes from Ian Ramsey, who observes the linguistically "odd" character of genuine theological affirmations. These consist of models taken from experience, so qualified to indicate their sacral (logically "odd") character. Such "qualified models" can be found throughout the range of Christian doctrine, e.g., in the phrases "first cause," "infinite wisdom," "eternal purpose" (where the qualifying adjective in each case points the empirically grounded noun in the direction of the sacral, so as to reduce anthropomorphism and increase awareness of God's "otherness"). Another example is "creation *ex nihilo*" where *"ex nihilo"* is the sacral qualifier:

> In all the "creation" stories we have told, there has always been *something* from which the "creation" was effected; there have always been causal predecessors. So that "creation" *ex nihilo* is on the face of it a scandal: and the point of the scandal is to insist that when the phrase has been given its appropriate empirical anchorage, any label, suited to that situation, must have a logical behaviour which, from the standpoint of down-to-earth "creation" language, is odd. When creation *ex nihilo* as a qualified model evokes a characteristically religious situation – a sense of creaturely dependence – it further claims for the word "God", which is then posited in relation to such a situation, that it caps all causal stories and presides over and "completes" all the language of all created things. It places "God" as a "key" word for the universe of "creatures".[91]

Ramsey's assertion here that the "odd" qualifier, conveying the sacral dimension, can be "any label, suited to that situation," reminds us again of the single source for all sound theological theorizing: Holy Scripture. Only the Bible can serve as an adequate guide for determining what sacral qualifiers are "suitable" to given doctrinal formulations.[92] On this note the present section of the essay can properly be concluded: Sacred Scripture offers the sole criterion for testing the scientific, the artistic, and the sacral health of theological theories. Does a given theory represent objective truth? Does it incorporate the proper kind of subjective involvement? Does it adequately preserve the sacred dimension? To all three of these questions *sola Scriptura* holds the answers.

The Structure of Theological Theories

Theory formation and testing in theology have now been analyzed from the points-of-view of science, art, and the holy. One final question remains – and it is, if possible, the most consequential of all: How do the three methodological aspects of theology relate to each other? Analysis has now been completed; what about synthesis? So important is the synthetic problem that to neglect it or to embrace a false solution to it is to insure failure in theological theorizing, no matter how honorable one's motives and impeccable one's procedures in other respects.

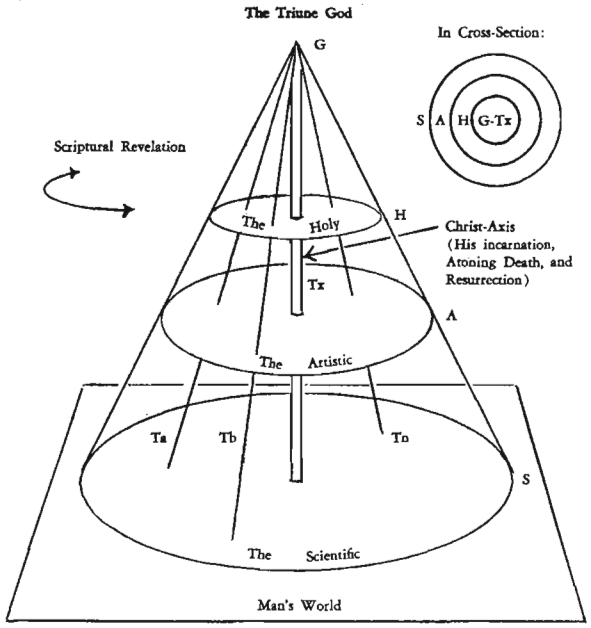
Let us clear the air by making explicit a fundamental principle to which we have already arrived by implication. We have seen, from clear scriptural evidence, that each of the three methodological aspects of theology is absolutely essential. Neither the scientific, nor the artistic, nor the sacral element can be removed from theological theorizing without destroying the possibility of results in harmony with God's Word. Thus we can legitimately expect to find deleterious theological climates wherever, in church history or in the present, reductionism is permitted with reference to one or more of the three methodological elements. The following table will indicate the unfortunate end products of the six possible methodological reductionisms:

REDUCTION OF	INTO	PRODUCES
1) Artistic & Sacral	Scientific	Dead Orthodoxy
2) Scientific & Sacral	Artistic	Pietism
3) Scientific & Artistic	Sacral	Mysticism
4) Sacral	Scientific & Artistic	Anthropocentrism
5) Artistic	Scientific & Sacral	"Theology of Glory"[93]
6) Scientific	Artistic & Sacral	Existentialism

In terms of this scheme, many of the unfortunate examples of contemporary theological theorizing already referred to in this paper (G. F. Woods' subjectivism, Hordern's Olympic Game thinking, Bultmannian and "post-Bultmannian" obliteration of the subject-object distinction, etc.) become more understandable: our age is particularly prone to reductionism (6), which eliminates the scientific element from theology, and produces wooly-minded, unverifiable existentialisms that readily pass into the realm of analytic meaninglessness. But let us not lose perspective; this methodological sin, heinous as it is, is only one of several committed through Christian history, and we must link together the scientific, the artistic, and the sacral elements in theology so that *none* of the six methodological blunders will be permitted.

How shall the elements be related? Certainly not in dialectical fashion,[94] for (as we pointed out earlier) a polar dialectic is an open invitation to reductionism, since, as pressure is brought to bear on theology from the sinful cultural situation, the theologian can readily and almost imperceptibly slide from one pole to another, avoiding the serious demands of each. (It is this dialectic approach, so hospitable to Neo-Orthodox and existentialist viewpoints, that has permitted contemporary theology, under pressure from "scientific" critics of the Bible, to avoid the basic issue of the historical and scientific authority of Holy Writ.) And not by an attempt to find a pivot in man's faculties (e.g., Lonergan's striking "insight" motif[95]) by which the several methodological levels can be tied together, for such a pivot will inevitably shift the focus of

theology from the God of Scripture to sinful man. Rather, we must structure the scientific, the artistic, and the sacral factors in theology so that they have a theocentric, Cross-centered focus, and so that the objective provides an epistemological check on the artistic, and the artistic serves as an entrée to the sacral. Consider, then, this structural model of theological explanation:



The cone represents God's revelation to man as expressed in Holy Scripture. This revelation, as we have seen, consists of irreducible, objective facts (the scientific level), to which subjective commitment must be made (the artistic level), and over which the divine majesty hovers in grace and judgment (the sacral level). The truths of which God's revelation is composed are legion (T_a, T_b, . . . T_n), but they all center upon the great truth which serves as the axis and focal point of the revelation as a whole: the Word become flesh, who died for the sins of the world and rose again for its justification (T_x). The task of systematic theology is to take the truths of revelation as discovered by the exegete, work out their proper relation to the focal center and to each other (in the model, these relations are represented by the distances between T_a, T_b, and T_x), and construct doctrinal formulations that "fit" the revelational truths in their mutual relations. In terms of the model, theological theories can be conceived of as cellophane tubes constructed to fit with maximum transparency the truths of revelation; the theologian will endeavor continually to "tighten" them so that they will most accurately capture the essence of biblical truth.

The theological theorist builds his cellophane tubes from bottom to top: he starts in the realm of objective facticity, employing the full range of scientific skill to set forth revelational truth; and he makes every effort not to vitiate his results by reading his own subjective interests into them.[96]

But as he climbs, he inevitably (because of the personal center of biblical truth) reaches a point where he must involve himself subjectively in his material in order to get at the heart of it; here he passes into what we have called the artistic level, where the semi-transcendent, subjective "I" cannot be ignored. Still he climbs, and eventually – if he is a theologian worthy of the name – he finds that his theory construction has brought him into the realm of the Sacred, where both the impersonal "it" of science and the subjective "I" of the humanities stand on holy ground, in the presence of the living God.

A concrete illustration may be of value here. The doctrine of the Trinity is a theological theory, since the term is not given as a revelational fact. In formulating this theory, the theologian commences by objectively analyzing the biblical data concerning the relations among God the Father, Jesus Christ, and the Holy Spirit – but especially in reference to the character of Jesus Christ, the focal center of theology.[97] He finds that Jesus fully identifies Himself with the Father through His words (e.g., forgiving sin), acts (e.g., miracles), and specific claims ("I and the Father are one"; "he who has seen Me has seen the Father"; etc.), and that He attests His claim to Deity through His resurrection.[98] The theologian discovers, moreover, that this same Jesus asserts that the Holy Spirit is "another of the same kind" (ἄλλον παράκλητον) as Himself,[99] and that in His final charge to His disciples He places Father, Son, and Holy Spirit on precisely the same level.[100] At the same time, the personal identities of Father, Son and Holy Spirit are manifestly evident in Holy Writ, though God is "One" to all the biblical writers. Conclusion: the God of the Bible is (in the words of the Athanasian Creed) "one God in Trinity and Trinity in Unity." The paradoxical character of this theological theory should not disturb us, for it is a conceptual Gestalt demanded by the data; the more "rational" (better: rationalistic) theories of unitarianism and modalism pervert the biblical facts in the interests of a superimposed logical consistency. The orthodox theologian properly and humbly subordinates his theory to the data, as the physical scientist does in formulating the paradoxical "wave-particle" theory to account for the ostensibly contradictory properties of subatomic phenomena:

> Quantum physicists agree that subatomic entities are a mixture of wave properties (W), particle properties (P), and quantum properties (h). High-speed electrons, when shot through a nickel crystal or a metallic film (as fast cathode-rays or even B-rays), diffract like X-rays. In principle, the B-ray is just like the sunlight used in a double-slit or bi-prism experiment. Diffraction is a criterion of wave-like behaviour in substances; all classical wave theory rests on this. Besides this behaviour, however, electrons have long been thought of as electrically charged particles. A transverse magnetic field will deflect an electron beam and its diffraction pattern. Only particles behave in this manner; all classical electromagnetic theory depends upon this. To explain all the evidence electrons must be both particulate and undulatory. An electron is a PWh.[101]

To be sure, the conception of the Trinity in Scripture is not fully or even principally comprehended by an abstract formula. Though on the scientific level

"Trinity" is methodologically analogous to "PWh", the comparison ceases when we rise higher. "PWh" is impersonal, but the Trinity is intensely personal and touches the life of the theologian at its very center. Thus in explaining the Trinitarian articles of the Apostles' Creed, Luther reiterates the subjective, "for me" character of the doctrine: "I believe that God has made me . . . . I believe that Jesus Christ, true God, begotten of the Father from eternity, and also true man, born of the Virgin Mary, is my Lord . . . . I believe that . . . the Holy Ghost has called me by the Gospel, enlightened me with His gifts, sanctified and kept me in the true faith."[102] Moreover, as the theologian contemplates the Trinitarian character of Holy Scripture, he is caught up in wonder and amazement, finding himself transported to the very gates of glory; with the Athanasian Creed, therefore, he must express by sacral qualifiers the "otherness" of superlative truth: "The Father uncreate, the Son uncreate: and the Holy Ghost uncreate. The Father incomprehensible, the Son incomprehensible: and the Holy Ghost incomprehensible. The Father eternal, the Son eternal: and the Holy Ghost eternal."[103]

Lost in wonder, then, does theological theorizing find its fulfilment. Commencing in the hard-headed realm of science, moving upward into the dynamic sphere of artistic involvement, it issues forth into a land where words can do little more than guard the burning bush from profanation. Here one can perhaps glimpse theology as its Divine Subject sees it: not as man's feeble attempts to grasp eternal verities, but as a cone of illumination coming down from the Father of lights (Jas. 1:17) — a cone whose sacral level brightens the artistic, and the artistic, the scientific level below it. The truly great theologian, like Aquinas, will conclude his labors with the cry: "I can do no more; such things have been revealed to me that everything I have written seems to me rubbish."[104] In the final analysis, the theologian must say of his theologizing what the great Wittgenstein said of his philosophizing:

> My propositions serve as elucidations in the following way: anyone who understands me eventually recognizes them as senseless, when he has used them — as steps — to climb up beyond them. (He must, so to speak, throw away the ladder after he has climbed up it.)
>
> He must transcend these propositions, and then he will see the world aright.[105]

REFERENCES

1. It will be observed that in this essay the term "theologian" is being used in the strict sense of "systematic theologian" or "dogmatician", not in the more general and perfectly legitimate sense of "professor on a theological faculty" (a category including exegetes ["biblical theologians"], church historians, homileticians, etc., etc.).

2. Fascinating studies of this nature are suggested by Etienne Gilson's *History of Christian Philosophy in the Middle Ages* (New York: Random House, 1955). Much needs to be done in the historical study of classical Protestant theological methodologies — e.g., the "analytic" and "synthetic" methods employed by dogmaticians of the 16th and 17th centuries.

3. A work along the lines of Rosamond E. M. Harding's *An Anatomy of Inspiration and an Essay on the Creative Mood* (3d ed.; Cambridge, England: W. Heffer, 1948) would be an exceedingly valuable addition to the literature of theology.

4. Walter Kaufmann, *Critique of Religion and Philosophy* (Garden City, New York: Doubleday Anchor Books, 1961), p. 221 (para. 57).

5. G. F. Woods, *Theological Explanation: A Study of the Meaning and Means of Explaining in Science, History, and Theology, Based upon the Stanton Lectures Delivered in the University of Cambridge*, 1953-1956 (Digswell Place, Welwyn: James Nisbet, 1958), p. 151.

6. Cf. John Macquarrie, *Twentieth-Century Religious Thought: the Frontiers of Philosophy and Theology*, 1900-1960 (London: SCM Press, 1963), pp. 274-75. Unhappily, Macquarrie does not personally take Garnett's critique to heart — or he would modify his own existentially-orientated theology!

7. William Hordern, *Speaking of God: the Nature and Purpose of Theological Language* (New York: Macmillan, 1964), pp. 86-89.

8. The Christian "Mt. Olympus," as Wittgenstein's student O. K. Bouwsma has well shown in his unpublished essay, "Adventure in Verification," is firmly embedded in the earth, and is indeed subjected to verifiability tests.

9. Cf. C. B. Daly, "New Light on Wittgenstein," *Philosophical Studies* [St. Patrick's College, Maynooth, Ireland], X (1960), 46-49.

10. Karl R. Popper, *The Logic of Scientific Discovery* (2d ed.; London: Hutchinson, 1959), p. 59. For Wittgenstein's presentation of the "net" analogy, see his *Tractatus Logico-Philosophicus*, 6.341-6.35. My former professor Max Black, in his exceedingly valuable work, *A Companion to Wittgenstein's 'Tractatus'* (Ithaca, New York: Cornell University Press, 1964), pp. 347-61, finds difficulties in the network analogy, but concludes: "According to the view I have been presenting the principles of mechanics are neither empirical generalizations, nor *a priori* truths. Taken together, they constitute an abstract scheme of explanation, within whose framework specific laws of *predetermined* form can be formulated and tested. If I am correct, Wittgenstein's central idea in his discussion of the philosophy of science has thus been vindicated." On Popper's approach to scientific theorizing, see Thomas H. Leith's unpublished Boston University Ph.D. dissertation, "Popper's Views of Theory Formation Compared with the Development of Post-Relativistic Cosmological Models," and Leith's article, "Some Presuppositions in the Philosophy of Science," *American Scientific Affiliation Journal*, XVII (March, 1965), 8-15.

11. Leonard K. Nash, *The Nature of the Natural Sciences* (Boston: Little, Brown, 1963), p. 61. Cf. Commissioner Tarquin's philosophy of scientific crime detection: "The trick is to surround it [the total crime situation] and then pull it all together" (Sebastien Japrisot, *Compartiment Tueurs* [Paris: Editions Denoël, 1962], chap. i).

12. The expression is Frederick Ferré's; see his article, "Mapping the logic of Models in Science and Theology," *The Christian Scholar*, XLVI (Spring, 1963), 12-15. I am not happy with certain interpretations in this article (e.g., the author's distinction between theories and models; his belief that scientific theories, unlike theological theories, can exist without models), but in general the article deserves the highest commendation for its incisive wrestling with an exceedingly important methodological issue.

13. Stephen Toulmin, *The Philosophy of Science* (London: Hutchinson University Library, 1953), p. 28 (Toulmin's italics). Cf. also Toulmin's more recent work, *Foresight and Understanding: An Enquiry into the Aims of Science* ([Bloomington:] Indiana University Press, 1961), *passim;* and Max Black's *Models and Metaphors: Studies in Language and Philosophy* (Ithaca, New York: Cornell University Press, 1962), *passim.*

14. Roger Louis, "A Team of Experimenters: The Men Who Discovered DNA," *Realités*, No. 154 (September, 1963), 45-46.

15. The process of discovery in the case of DNA can be traced back directly to Max Perutz's labors as early as 1936, and the Watson-Crick theory took several years to be collaterally confirmed by Maurice Wilkins, Perutz, and John Kendrew. All five were joint recipients of Nobel prizes (chemistry and medicine) in 1962. For a recent technical overview of the state of research in the DNA area, see Duane T. Gish, "DNA, RNA and Protein Biosynthesis and Implications for Evolutionary Theory," *American Scientific Affiliation Journal*, XVII (March, 1965), 2-7.

16. Cf. the basic distinction made by Wittgenstein between "objects" or "things" ("Der Gegenstand ist einfach" — *Tractatus Logico-Philosophicus*, 2.02) and "facts" ("Was der Fall ist, die Tatsache, ist das Bestehen von Sachverhalten. Der Sachver-

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TEILHARD'S SCIENTIFIC ATTITUDE

ROBERT J. O'CONNELL, S.J.*

1. *Teilhard's project, its starting point and intention: The Teilhardian corpus has a unity and is held together by a profound intention, i. e.*

a) *to communicate to his fellow Christians what is valid in the "religion of the earth" as he found the unbeliever of his early years professing it,—thus the value of matter, research, progress, in short all the values of "this world". Thus the Divine Milieu, etc.*

b) *to communicate to scientists and those taken up with this world the religious dimension implicit in their valuing this world and its activities as they do. Thus the Phenomenon of Man.*

c) *to impart some guidelines for the Future of Man, to keep the spirit of optimism and progress alive, and working in the most fruitful channels.*

2. *Teilhard's rethinking of biology in line with the second of three phases in his effort: the gradual elaboration of a method which he calls hyperphysics. I shall try to sketch what this implies for him, how it impinges on the world of life that the biologist studies, on the world of matter studied by the physicist, and what immediate difficulties it has seemed to raise in the eyes of critics. It would be at this point that I would hope questions and discussion would start, for there is plenty of material for both.*

We used to hear, some years ago, a song that went: "Please don't talk about me when I'm gone". I doubt whether Teilhard would have sung that song and meant it. At any rate, he is certainly being talked about: in Europe, both Christians and Marxists find his thought the most hopeful bridge this century offers between what once seemed their irreducibly opposing views. In England, where thinkers have been galvanized by C. P. Snow's dramatic underlining of the "Two Cultures" problem—by his challenge to scientists and humanists, and especially to the latter, to come to some understanding of their opposite numbers—Teilhard's own effort to bridge that yawning chasm has excited genuine interest. The young leaders of Africa look to his synthesis, his "vision", as a possible mode of reconciling their ambition to share in the technological benefits of the Western world, with their determination still to cling to their ancient spiritual heritage. And now, in America, where all these same problems harry us, we find the supply of his writings suddenly far outstripped by the clamoring demand for them.

He is, we are told, a voice that speaks to the problems of our times, the herald of a unitary vision which our fragmented intelligences sorely need, the prophet of our 20th century. One cannot entirely suppress the suspicion that a certain romanticism runs through such claims: the very portrait of the man who looks out from the cover of the *Phenomenon of Man*, the lines of gentle wisdom on his noble face, the peace of long and patient struggle welling from those eyes, half mystical, and yet so profoundly warm and human—the very look of the man is an enchantment. And that look, from all we know, does not deceive: Teilhard was like this,—as Professor Barbour has put it, the "noblest man with whom I have ever lived", or as his old Superior at Paris phrased it, "the most Jesuit Jesuit I have ever known". Which reminds us of the added fact that he was a man long silenced by his own superiors in the Society of Jesus: oh, what a potent new reason for romantic effusions, particularly now, when voices are raised about freedom of speech in the Catholic Church, and raised in tones of gleeful triumph which make one wonder how the agonies of a Teilhard, a de Lubac, a Rahner could, so short a time ago, have been even possible. As a person, and a martyr in his way, Teilhard's attractiveness is beyond question.

And yet, there are other voices: that personal attractiveness, they warn us, could be a dangerous snare. For Teilhard's person was one thing, his thought is quite another dish of tea: a brew compounded of poetry and mysticism mixed with half-digested science, sugared by an infusion of tipsy, euphoric prose; his frantic efforts to deceive are only partly excused by the lengths he went to deceive himself; his science

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is bad, but his theology is worse; he would present us with an evolution which the evolutionist can scarcely recognize, a Christianity which twists the ancient tradition horribly out of shape, an optimistic vision of the future in which we are asked to drift supinely on our backs till the evolutionary current bear us where it will,—to the ant-hill, with joy!

To one taken, as I must admit I am, by the person of Teilhard, these indictments of his thinking seem sometimes only thinly to veil a camouflaged attack upon the man himself,—for the graceful life he lived precisely in witness to his vision: if self-deceived and now deceiving others, then the sincerity of his life-project stands, in part at least, condemned. And yet, what breeds a certain sympathy even for the most intemperate of his accusers is their evident seriousness: they implicitly admit that there are problems, gigantic and troubling problems involved in such a project as Teilhard made his own. They see that such a project as he took upon himself is eminently worthwhile, even urgent for our times: their complaint is,—and if it can be founded it must be taken seriously,—their complaint is that Teilhard was unable to measure the grandeur of his project, because ill-equipped to envisage the size, the contours and the baffling complexities of the problems it involved. When names like Medawar, Simpson, and in a more qualified way, Dobzhansky, are ranged against Teilhard, the fact must give us pause; when, on the philosophic side a Toulmin, a Nagel, a D'Armagnac, McMullin or Polanyi, have their difficulties with his way of interpreting scientific findings, it should make the thinking man reflect. The prophet *may* just be a pied piper; his vision *may* just be another drifting fire inviting us to wander and eventually founder in a bog. History is too full of such enthusiastic visions and visionaries. Teilhard, we are assured, will free us of the shackles of Thomism,—but those shackles, if shackles they be, we ourselves have forged and put on: are we being urged to sing another rousing chorus of the same old tune, but in another key? If we made the mistake once, we ought at least to be a trifle shy in making it again.

Aristotle here injects the note that must guide all reflection on Teilhard: the friends of the Ideas, he says, speaking of his master Plato, are our friends too; but truth must be a greater friend. We must attempt to dissociate ourselves from the personal spell Teilhard's biographies weave, and judge the validity of what the man said. And he himself, be it noted, would have it no other way. "I may," he admits at the end of his *Phenomenon of Man*, "I may have gone astray at many points. It is up to others to do better. My one hope is that I have made the reader feel both the reality, difficulty, and urgency of the problem, and at the same time the scale and the form which the solution cannot escape" (290).

I must apologize for having harped so long on the need of this initial attitude, the attitude of simple objectivity, lucidity, reasonableness,—particularly before a group such as this, where it may more safely have been presumed. But experience is a bruising thing, and it has pounded into me again and again that one cannot, in Teilhard's case, assume too much: too few are willing to bring to his work the required patience, the scrupulous objectivity, a receptivity to whatever truth he may have hit upon, along with the willingness to disentangle it where necessary from whatever errors there may be. Before either criticizing or following the man, we must take the time to understand him: to situate the project he took on, find out what he was trying to do, and then, soberly ask how well he succeeded in doing it: how well did he solve the problems that went with his project.

1. Teilhard's project:

A. *Its three "moments"*

Teilhard's life-project can, I think, usefully be considered as having three distinguished moments. I call them "moments"—not in the chronological sense of the term, but to describe those accents, points of emphasis, which assume varying importance in differing stages of his career. Right from the beginning, he is speaking to three distinct, but inseparably interwoven preoccupations: the preoccupation of the Christian theologian, whom he urges to take the scientific picture and the "religion of the world" with appropriate seriousness; the preoccupation of the scientific thinker, whom he tries to get to see the human, and religious dimension of the *Weltanschauung* science presents for our belief; and thirdly, the preoccupation of the man of action, the man involved in furthering the interests of humanity: to him, he wishes to present the probable lines of future human development, to guide his action into the most fruitful channels, and most of all, to assure him that there is hope for that future, despite what an all too often incomplete scientific view of the future would lead him to believe.

B. *The first moment*:

All three of these moments are, therefore, present in Teilhard's mind and writings at any one point in his career. But in the earlier works, one may think, he addresses himself mainly to the Christian theologian, suspicious of the evolutionary world-view which, in Teilhard's early life-time, was still struggling against an all-too-literal interpretation of the Book of Genesis. The first major work from his pen is the *Divine Milieu*, but its message is already presaged by the war-works (just published in French as *Ecrits de Guerre;* in the *Hymn to the Universe* which has been translated (badly) and *The Making of a Mind* which has been published in the brilliant translation it demanded). Here he is trying to show how splendidly the Christian view coheres with the evolutionary view of man and of the world. In doing so, he must to some extent "interpret" Christianity—selecting certain strands in both Scripture and tradition which favor his syn-

thesis, and letting others subside into much less prominence. Theologians question whether he has suitably recognized the problems of sin and evil; whether God's gracious intervention in Christ Jesus does not become a necessary, hence no longer "free" and genuinely "gracious" invasion of human history; whether his view of Christ's redemptive activity is not distorted by his evolutionary preoccupations; whether the individual is left really free to maneuver in, and even swim against, the drift of the evolutionary current. These and other questions have been asked by serious men, and they should be taken seriously: but our own preoccupation now does not lie here.

C. *The third moment*:

To skip now to the third moment of his activity: the *Future of Man,* which some of you have read, shows Teilhard insisting that evolution is still going on, that man is evolution become conscious of itself,—conscious, and therefore capable of seizing the helm and —freely—directing its future course into most fruitful channels. Teilhard thinks that the scientist whose view of the future is governed mainly by the second law of thermo-dynamics, who thinks of the universe as entropically "running down" and inexorably heading for a "cold death", is preaching a gospel of cosmic despair whether he realizes it or not. If this is all the future really holds for us, then mankind, once the word gets round, will simply "go on strike", lose all interest in the world, stop laboring for the betterment of the human condition. The existentialism of the Second World War seems to have frightened Teilhard: this word of despair was, he felt, getting round: his writings, be it noted, never deny the darker aspects of existence which the Existentialists unilaterally stressed,—the horrors of Dachau and Buchenwald, the dread of the bomb, were things which darkened his imagination as much as anyone's. And yet, he claimed, there was another cosmic drift besides the one toward entropy: the upward drift of evolution was of equal, nay, of even greater importance—qualitatively. There was another side to the black portrait of human cruelty his adversaries kept thrusting before his eyes,—the wildest acts of barbarism sprang from some desire of good, of betterment,—just as every heresy is the revenge of some forgotten truth. What totalitarianism, for example, had in view, was something we Christians and defenders of democracy have all too frequently forgotten: the mutual involvement of the individual with other men, with the entire human race and with the entirety of God's creation. This corporate aspect of Christianity—the view of the Christian as member of a Body, of an *Ekklesia,* the view that Church as a leaven meant to ferment the entire mass and bring it to the "Fullness of Christ Who filleth all"—this corporate aspect is something which the ecumenical movement, among others, has forced us all to rediscover; it put Teilhard significantly ahead of his theological time,—and makes one wonder whether some of his critics on this point are not aiming their shafts from a spot situated squarely in the 19th century.

D. *The second moment: "hyperphysics"*

But so much for the first and third moments of Teilhard's project: the second moment, which we might most appropriately consider here, cannot be evaluated entirely divorced from the other two, but it can and ought to be discussed distinctly from them. The only work of his so far translated—and horribly translated—into English, which shows him in the stance characteristic of this second moment, is the *Phenomenon of Man.* I need not tell you that this is an extraordinarily difficult book, some of you have doubtless tried to hack your way through it. What I wish to stress is that it is a far more difficult book than many have imagined: and that number must include both critics and admirers of Teilhard. Really to understand it, one must first be content to read it in the French; then read the entire series of essays written from 1921 to 1930—mostly from the second and third volumes of his works, *L'Apparition de l'Homme"* and *"La Vision du Passé"*,—essays which make it plain exactly what he is trying to do, and how he went about elaborating the method he brings to doing it.

"If this work is to be properly understood," his first words in the *Phenomenon* warn us,

> it must be read not as a work on metaphysics, still less as a sort of theological essay, but purely and simply as a scientific mémoire . . . This book deals with man *solely* as a phenomenon; but it also deals with the *whole* phenomenon of man.

The first disservice this translator performed toward the English-speaking world—particularly that part of it which is unwilling or unable to consult the French original, about 99% from what one can judge—was to translate that ambiguous word *mémoire* as "treatise". Had Teilhard wished to say that, he would have written *traité* instead: but this would have meant something quite technical, and given the impression that he meant, in his work, to "do science", "practice" science as the term is presently accepted,—as most of his critics, and many of his admirers, have somewhat prematurely assumed.

But this is exactly what he is not doing; if you wish to judge his practice of science, then consult his geological and paleontological reports, they number in the hundreds, where you will find an entirely different approach, another standard of evidence, a resolute refusal to take in—as he says here—"the *whole* phenomenon of man."

What is implicit here, and made repeatedly explicit in the methodological observations which dot the *Phenomenon of Man,* (pp. 29-36; 54-54; 142-146; 163-164) is Teilhard's acute consciousness of what he is doing, as distinguished from what the scientist normally, but quite legitimately does. Nowhere, be it noted, does he suggest that scientists should now start practicing their trade according to a different method, and using new standards of evidence; his

suggestion is, rather, that when he comes to reflect on the *meaning* of what his ordinary practice of science discloses, the scientist must become keenly conscious of the fact that his approach has been a partial one, has deliberately eschewed certain aspects of the reality studied, has left them out of consideration in order to treat certain other aspects with as much precision as can be brought to their treatment. When reflecting, therefore, on the meaning of what his method discloses about the world, the scientist must develop—in his terms—another, complementary way of "seeing"—of seeing the *whole* phenomenon: not only the spatial immensity of the cosmos as we know it, the enormous stretches of time in terms of which we are obliged to think of its development, the bewildering multitude of elements that go to make it up: all these, Teilhard is confident, the scientific mind experiences no difficulty in accepting. But what the initial abstraction involved in scientific knowledge all too often steals from the scientist's way of seeing, what the scientist, therefore, all too often lacks when he comes to reflect on the implications of his findings, is "a sense of quality or novelty . . . a sense of movement . . . (which helps him detect) the entirely new insinuating itself into the heart of the monotonous repetition of the same things, (and) a sense, lastly, of the organic, discovering physical links and structural unity under the superficial juxtaposition of successions and collectivities (*Phenomenon* 33-34).

Three "senses", then,—of quality and novelty, of movement, and of the organic; does Teilhard mean to imply that these are indispensable equipment for the scientist in the normal practice of his trade? Something very like it has, it should be noted, been suggested by others, and some of the names involved are names to conjure with: Dewey has insisted on that sense of quality and novelty, Whitehead on the sense of the organic and of movement; practicing biologists like Sinnott and Dubos have tried to bring some such manner of envisaging reality to their work as scientists. But it is not clear that this is exactly what Teilhard has in mind: he is insisting on these senses for the man who would practice the kind of thing his *Phenomenon* represents,—and the name he attaches to it is not science, but "hyper-science"; not physics, but "hyper-physics".

II. Genesis and structure of method:

The *Phenomenon of Man,* however, confronts us with this method fully-developed; to see what it implies, and judge its value, we must watch it as it developed in his thinking. Then both its differences from and its relationship to science may become clearer.

Science, Teilhard's earlier writings disclose, has as its first task to furnish us with the phenomenal film of what occurs, and what did in the past occur. Let the theologian rant against anti-biblical implications of evolution, let the metaphysician rant to us that such a thing must be impossible: the scientist, Teilhard proposes, asks the simple, modest question: did it, or did it not happen? What does the film of the events in cosmic development tell us? The theologian's business is to make sense of that, the metaphysician's task to ask how such a thing is possible, once its possibility emerges from the sober, objective inquiry of the scientist.

But here Teilhard must meet with an objection: his theologian friends might easily have reminded him of the work of Ernst Haeckel, whose propaganda for the "scientific", evolutionary view of man claimed to show that the Bible was wrong, Christianity a fiction, the creator-God a hypothesis of which the scientist no longer had need. No, Teilhard answers, no: the scientific picture, he tries to show, is both theologically and metaphysically neutral, says nothing *per se* for or against God, Christianity, the Bible: Haeckel has gotten both a materialistic philosophy and a misunderstood theology mixed up with his half-digested science—exactly, be it noted, the accusation leveled at Teilhard by some of his scientific critics. Science, of itself, contains a dynamism which drives it to a comprehensive explanation of the real as it appears in space and time: but the kind of explaining science does is on one level, the kind theology and metaphysics attempts is on another. These levels, Teilhard insists both in his earlier essays and in *Phenomenon,* must not be confused, must not get mixed up: they may, and must "converge"—that is, supplement each other's views of the same reality—but they must not do this at the price of merging, getting tangled up in one another, each claiming its method is appropriate for the other's task.

And yet, this program does not solve the problem that faces Teilhard. How was it that the scientists—more generally in his time than now—almost uniformly take the materialist, the anti-biblical stance? You claim, his theologian-friends could justly remind him, that the scientific picture is reconcilable with the Christian view of man and of reality: how will you get your scientific confrères to admit to that?

Reflecting on what man experiences of himself as a creature of interiority, "within", Teilhard is faced with consciousness and liberty; and yet, these properties are all too often left out of scientific studies of man; in scientific studies of reality outside the human sphere, however, they are quite deliberately excluded from consideration. The result is a curious anomaly: man finds himself a creature of consciousness and liberty, the scientist assures him he is the product of evolution that began with hydrogen, moved through the higher elements and molecules, the simpler forms of life, and presto! from constituents without a trace of these two crucial properties, we are to believe that a free and conscious product has emerged.

This, Teilhard decides, is anomaly number one: that

scientific explanation regularly ignores the "within" of man, and regularly supposes there is no analogue of that "within" in the elements which have gone into man's constitution.

There is, however, a second anomaly,—we have briefly alluded to it earlier. The Physicist, mesmerized by the Second Law of Thermo-dynamics, sees the universe running down; the biological sciences, on the contrary, find life pushing ever upward to newer, more complex, more developed forms. But, the normal mode of resolving this apparent conflict says, the entropic drift is the universal, overarching, all-embracing drift of matter,—the upward, evolutionary movement is but a relatively localized and momentary phenomenon: it is doomed eventually to be caught up and drowned in the other.

And yet, there are indications that this picture is not so neat as it originally appears: if evolution began with the simplest stages of matter, then the upward tendency is not merely peculiar to living forms of matter, but is just as universal as the entropic movement: the two are as associated in the physicist's picture of the universe as "successes" and "failures" are throughout the spectrum of evolution. Instead, therefore, of considering the entropic as the privileged, the primordial and fundamental movement of matter, why not associate the two throughout the entire scale of material forms: why not say that evolutionary success on every level must be paid for by a bewildering number of evolutionary failures,—and that entropy is the result of these failures?

The proposal seems a simple one, but it involves a revolution in scientific thinking: it involves, first of all, the concept of science as engaged in presenting us with a "natural history" of the entire cosmos-in-development, "cosmogenesis". Secondly, it implies that the various forms which matter assumes—from atom to man—since they develop into one another, are to some extent homogeneous with one another; the lower and higher forms of material being constitute a fundamental continuity; and this means that no property found anywhere on any level of material being, can be thought as totally absent from the lower levels which went into the formation of the higher level at which the property manifests itself. If man is conscious, then all matter must, to some extent, be conscious: however diminished and shadowy that consciousness may be when compared to man's developed consciousness. And here it must be noted that the continuity Teilhard insists upon admits, even requires, certain "critical thresholds" which would seem at first to "rupture" that continuity. By continuous application of heat, water suddenly crosses such a threshold and becomes steam: discontinuity within the frame of fundamental continuity. And so, too, with the evolutionary development of matter: man represents just such a critical threshold, where the powers of matter seem to enter another order of being, seem to take a leap "from nothing to everything"; they seem, in fact, to burst into a fullness which makes the earlier forms so primitive that all organic relation between them and man becomes unthinkable. But this is only appearance: the transformation is abrupt, dramatic, but does not constitute a genuine rupture in the continuity of space-time forms of evolving matter. The picture remains coherent.

The same will hold for liberty: all forms along the evolutionary ladder must possess some diminished measure of "spontaneity" in their activity, if their combination is ever to produce that full-blown liberty we experience as men. Even the atom, which the physicist has thought his province, Teilhard now thinks rather in the manner of a biologist—or better, through the lens of a biology already "psychologized".

What he has, in effect, done to science is to stand it upon its head, with the calm assurance that it is now, for the first time, since Aristotle, right-side up. The normal scientific approach is regressive: as the scientist understands the term, we "explain" the action of a large unit as the resultant of the myriad actions of its smaller constituents: the molecule behaves this way because the atoms which make it up behave the way they do; and their behavior is explained by the action of their constituent particles. And nowhere here must he appeal to such "anthropomorphisms" as consciousness, choice and pursuit of ends-in-view. But, says Teilhard, each whole always betrays some properties which cannot be explained by the mere addition of partial results; each higher synthesis manifests some activities which surpass the more primitive capacities of the lower elements into which, scientifically, we analyze that synthesis. How, then, are we so sure the lower elements were quite so primitive in the first place?

Now the highest synthesis of matter under observation is man: the normal regressive mode of scientific analysis cannot explain that such a conscious creature should appear as the product of blind mechanical interactions; nor can it help us understand that freedom should emerge from a play of physical determinisms. If, however, we take the reverse stance; if we estimate what must be in the constituents for this product to emerge, if, in short, we make man the privileged locus where the properties of matter reveal themselves in their most developed state,—then the anomalies of ordinary scientific explanation vanish, things fall into place, the picture becomes *coherent*. Coherence: the word is a key one, for in Teilhard's hyperphysics coherence takes the place of experimental verifiability as the hallmark of truth. What, then, is the "coherent" view of reality which emerges once this point of view is taken?

Like man, all matter has a certain quantum of "within": a certain measure of both spontaneity and

consciousness. That measure, on the lower levels, is so diminished that it can safely be ignored,—just as, in classical mechanics, we could ignore the variation of mass with velocity. Indeed, the scientist is fully warranted in pursuing his ordinary practice of regressive analysis, when practicing science. But when trying to make sense of scientific findings, when trying to present us with a coherent view of the cosmic development, he has no choice but to adopt another stance: view things from the hyperphysical standpoint; view man, not as some erratic, unexplainable exception in a universe totally alien to his moral, esthetic, and religious concerns, but as the advance flank of an evolutionary thrust: and then, that evolutionary thrust can be envisaged as dimly groping, down through the ages, questing in man's direction, putting forth the immense profusion of life-solutions we find in the paleontological record, all in the interests of installing life, and consciousness, and liberty upon our planet. And man has been placed once again where he belongs, not spatially but qualitatively in the center of things.

Viewed in this way, Teilhard's world at last assumes a "face", becomes a universe both personal and personalizing, is "open" to the possibilities of Incarnation, Redemption, Survival. The scientist, Teilhard is convinced, represents an important segment of humanity devoted to God's world, its interests and its progress; and yet, in the course of their elaborations, they have presented a view of a universe without a future,—what, then, will become of their own activity? Without some hope, some way out of the cosmic trap their universe becomes for man, without something—or better, Someone— "up ahead" to inspire their efforts, bolster their faith in the worthwhileness of what they are doing, then they too will go on strike, their effort will be self-defeating. Evolution, for the first time become free to do so, will grind to a halt.

But what of that? What, to parody Hamlet's question, is Evolution to me or me to evolution? It mattered deeply for Teilhard personally. And that fact brings us back to the deepest roots of his conviction, a conviction that sprang from his early, rich experience of the earth: poetic, mystical, esthetic are terms he himself uses in this connection. The piece of iron the child Teilhard found so durable, the rocks of his native Auvergne which seemed, in the phrase of his Jesuit contemporary, Hopkins, "charged with the grandeur of God", were literally revelations, epiphanies to a mind already soaked in the faith and hopes of Christianity. This was God's world, a world he found so dear as to send His Son to wrap Himself in its substance, impart his Life through bread and wine and water and chrism, charge flesh and matter with the word of life,—of life, and of a giant hope for a human history that truly advances, truly goes somewhere, has somewhere to go. How much of this poetic, mystical vision of the world has crept, without his being fully aware, into his hyper-scientific thinking? The question calls for another, one that he himself has raised: how much does any scientific view draw nourishment from some underlying faith, which the practitioner of science brings necessarily to his enterprise, his findings, and to the sense he tries to make of both?

BOOK REVIEWS

MARLIN KREIDER, *Editor*

A CHRISTIAN INTRODUCTION TO RELIGIONS OF THE WORLD

by Johannes G. Vos; Grand Rapids, Mich.
Baker Book House,
1965. 79pp., $1.50 paperback.

This short book is a consistently Christian and mission oriented handbook to some major religions of the world. Designed for personal reference and study group purposes, the statements on Hinduism, Buddhism, Confucianism, Shinto, Mohammedanism, and Judaism are brief and supported by study helps.

This guide is based on Prof. Vos' course in comparative religions at Geneva College where he is Chairman of the Department of Biblical Literature. It also reflects his experience as a missionary to Manchuria and China.

The reader is cautioned to maintain an objective approach to world religions. It is necessary to discern the truth in world religions so that their worth may be properly balanced against Christianity. For a missionary to approach other religious systems with a less tolerant view is to jeopardize his ministry. Hence, we are reminded that "True scholarship and sound thinking should always be on guard against too-simple answers to difficult questions and too-simple solutions to baffling problems". Surely such advice always remains fresh.

The book steers a very narrow course through rough waters. It is precisely the kind of direction needed by mission, Sunday school, and youth study groups. As an introduction to the anthropological perspective for the layman, it is useful and lucid.

Reviewed by Russell Heddendorf, Assistant Professor of Sociology, Geneva College, Beaver Falls, Penna.

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THE SOURCES OF SCIENCE

DAVID F. SIEMENS, JR.*

Although it is commonly held that science and religion are irremediably in conflict, it can be shown that science owes it birth to Christian thought. The non-Christian civilizations did not develop scientific thought because they lacked the concept of the Creator. Only when Galileo combined Greek mathematical thought with the Hebrew-Christian concept of the omnific, omniscient God did science in the modern sense start. The secularized version of this belief still undergirds science, even though its secular form cannot function as a rational foundation. Christian morality was also important in the development of science.

We live at a time when religion and science seem to be either pretty well divorced or very definitely in conflict – more usually the latter. None other than Einstein tells us: "It is therefore easy to see why the churches have always fought science and persecuted its devotees."[1] In this sort of situation, it is a little hard for us to realize that science is Christian in its origins and continues to bear the marks of its Christian origins. There is a corollary to Christianity. As Galileo, the man basically responsible for the founding of modern science noted:[2]

> . . . the holy Bible and the phenomena of nature proceed alike from the divine Word, the former as the dictate of the Holy Ghost and the latter as the observant executrix of God's commands. . . . . nor is God less excellently revealed in Nature's actions than in the sacred statements of the Bible.

If both come from God, they obviously cannot contradict each other. But it is not time to start providing a corollary until the original theorem has been demonstrated.

My thesis is that science is Christian in its origins. One aspect of the proof is involved in the question: Why did the Greeks not develop modern science? They certainly had the thinkers to do it. Thales, who predicted an eclipse on May 28, 585 B.C., was apparently absent-minded enough: he is reported to have walked along watching the stars until he fell into a well. The

Pythagoreans discovered the laws of harmony and the vibration of strings, but went no further. Plato was a genius and a first rate mathematician. Aristotle, another genius, developed logic, collected facts, and left a massive collection of works. Besides these, there were a host of mathematicians – Euclid, who produced geometry; Archimedes, who extended geometry in connection with the circle; Appolonius of Perga, who developed the theory of conic sections; Nichomacus of Gerasa, who developed the system whereby tremendous numbers, such as quintillions (10^{18}), were handled. Yet with all this logical and mathematical ability, the Greeks, and the Romans who followed them, never developed any empirical science. Why?

All the Greeks thought that the world of experience could not be understood. Plato's God was a craftman, not a Creator; a workman who had to do the best he could with what was available to him. But the stuff would never work out exactly. There were always tolerances, plus or minus, and rejects that somehow got back in the good bin. So Plato says repeatedly that one cannot have a science of things, only of ideas.[3]

Aristotle, who followed Plato, and who became "*the* Philosopher" of the later Middle Ages, did not even have a Creator. God, relative to things, was the ultimate

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Form which reacted against eternal prime matter, and thus produced everything in the world. But, everything except God was produced by the combination of the rational, understandable form with the formless, irrational, incomprehensible matter. There is no use trying to understand things: they cannot be understood because they have a meaningless core.[4] Moving on in time, Aristotle was – after Aquinas sprinkled him with holy water in his *Summas* – the ultimate authority for the majority of Christians. Aquinas did make God the Creator, but he kept Aristotle's doctrine that matter makes things incomprehensible.[5] It was a revolt against the dead hand of Aristotle that made Galileo the Father of Modern Science.

The Greek atomists, who have been given credit by some for beginning a sort of science, were no better off. Heraclitus believed that all things are in a perpetual state of flux, so that no knowledge of them is possible.[6] A later heir of Democritus and Epicurus wrote:[7]

> . . . our world has been made by nature through the spontaneous and casual collision and the multifarous, accidental, random and purposeless congregation and coalescence of atoms. . .

And there is no science of the accidental.

Obviously, no hope of science can be found in the Eleatic school of Parmenides, Melissus and Zeno, who held that *all* the changes reported by the senses are mere illusions. Yet it is from one or another of these views that the philosophical outlook of the later Greeks and Romans came.

Obviously, no one is foolish enough to seek order where they are sure that there is only disorder or illusion. This is why the Greeks never turned to nature. They turned instead to mind, to the rational and orderly world of thought, to mathematics. But even here there was a problem. The Pythagoreans, in the process of the investigation of numbers, came across the surds, which we still call the "irrational numbers", although they are as reasonable as any of the others. They did not fit into the pattern which the Pythagoreans thought numbers ought to have; so they tried to suppress the discovery.

Now, I do not want to give the wrong impression: the Greek contribution to science is essential. Without mathematics and logic, science could not come into being. But something else is absolutely necessary: a belief in the orderliness, the rationality of the world. Where did this idea come from?

It came from Genesis 1:1: "In the beginning God created the heavens and the earth." And from Ephesians 1:11, where Paul speaks of God "Who worketh all things after the counsel of his own will." The Christian believes that the world is orderly because it was created by the God of all order, the One who is the Truth, the Word. And remember, "Word" or "*Logos*" means also reason.

Coupled to this view is the insistence that man is rational, in the same way that God is rational, although in a more limited fashion, for man was created in the image and likeness of God. Therefore man can think God's thoughts after Him. This is the real motivating force behind science. Whitehead, the noted philosopher, spoke of this belief in order:[8]

> Without this belief, the incredible labours of scientists would be without hope. It is . . . the motive power of research – that there is a secret, a secret which can be revealed. When we compare this tone of thought in Europe with the attitude of other civilizations when left to themselves, there seems but one source for its origin. It must come from the medieval insistence on the rationality of God, conceived as with the personal energy of Jehovah and with the rationality of a Greek philosopher. Every detail was supervised and ordered: the search into nature could only result in the vindication of the faith in rationality.

But Christianity is even more crucial than this, although it is a matter of record that science never developed anywhere except where there was Christian influence. In fact, it came into being only once.[9] And it is also enlightening to note that the extension of science came mainly in the areas where the Bible was most often and freely read.

What do I mean: that Christianity is even more crucial? Galileo considered the similarities and differences between man and God. If God and man both know the world, where is the point of similarity? God has no senses, as man has, so the point of contact cannot be on the basis simply of the senses. What can man have in common with the infinite, all-wise God? Galileo says:[10]

> As to the truth, of which mathematical demonstrations give us the knowledge, it is the same which the Divine Wisdom knoweth; but . . . the manner whereby God knoweth the infinite propositions, whereof we understand some few, is highly more excellent than ours. . .

Kepler had the same view.[11]

> God wanted us to recognize those laws by creating us after his own image so that we could share in his own thoughts. For what is there in the human mind besides figures and magnitudes? It is only these that we can apprehend in the right way, and if piety allows us to say so, our understanding is in this respect of the same kind as the divine, at least as far as we are able to grasp something of our mortal life. . . . for God's counsel's are impenetrable, but not his material creation.

Is this view still to be found in science today? Yes, but in a secular form. There is still the insistence that man can understand the universe by applying mathematics. Certainly, there are those who deny that the universe is rationally organized. But even these act in spite of their statements as if it can be understood. And they go on making discoveries. But they can give no explanation as to why we should be able to understand things. Indeed, they become a little ridiculous, for their basic belief, shorn of big words and complicated phrases, is: The universe is orderly because I am orderly; the universe is understandable because I make it understandable. If I tell you: "I am the source of all reason," you will immediately conclude that I should have psychiatric treatment. But if I use big enough words, I am a philosopher, and the sanest of the sane.

What of the others who do not go so far? They believe that the world is rational, and that man is rational, but they do not believe in God. There are such. They are faced with the problem that they can give no *reason* why man and the universe should so match each other. They can only believe that they match with a blind faith – and these are commonly the ones who accuse the Christians of credulity. One American philosopher wrote of them:[12]

> They perceived that the Newtonian world without God must be a world in which the reach and certainty of knowledge is decidedly and closely limited, if indeed the very existence of knowledge at all is possible.

Let me emphasize this latter: they held their views in spite of grave doubts about the validity of any conclusion they might have. Do you see why I accuse them of blind faith, rather than attributing to them intelligent faith?[7]

There is another Christian element in the development of science. A great deal of scientific development comes from concern for the needs of others, that is, from mercy or compassion. As Bacon prayed:[13]

> Wherefore, seeing that these things do not depend upon myself, at the outset of the work I most humbly and fervently pray to God the Father, God the Son, and God the Holy Ghost, that remembering the sorrows of mankind and the pilgrimage of this our life wherein we wear out our days few and evil, they will vouchsafe through my hands to endow the human family with new mercies.

Again, he notes that science is "for the glory of the Creator and the relief of man's estate."[14]

These are the words of a philosopher. But they are backed up by the works of many. In the prefaces of book after book detailing advances in various areas, the authors express their concern for the needs of men. One of the early treatises on architecture three times mentions the "public benefit" as the goal of the author (Mathias Roriczer, 1486).[15] The same is noted by Robert Norman, who wrote about the navigator's compass in 1581. Scientific discoverers "chiefly respect either the glory of God or the furtherance of some publick commoditie." Tartaglia, the noted mathematician, in his *Quaesiti Inventione* (1546), notes service to the public and progress as grounds for publication, and assails those who would hold discoveries secret. The same attitude is seen in Simon Stevinus in his several books on applied mathematics, published between 1605 and 1608. Pare, a French surgeon, in *La methode de traicter les plages* (1545), hopes to stir superior minds to write so that all may have greater knowledge, so that "some fruit and benefit to the support of the weakness of human life" may, by God's will, come from his labors. Generally, he suggests the public benefit, the benefit of France, the benefit of patients and the glory of God as his goals.

Apian published a Latin treatise on a quadrant for measuring angles (1532). The next year he published a German version for the general benefit of his countrymen. The quadrant was invented "to benefit the whole of Christianity and almost the whole world." Mercator, the geographer, notes in his *Atlas* (1595), "we are not born to ourselves alone, but the Creator ordered us to live for the common weal."

Under the impact of Bacon's view, the Royal Society of London was founded for "the Grand Design of improving Natural knowledge . . . All for the Glory of God, the Honour and Advantage of these Kingdoms, and the Universal Good of Mankind."

In addition to all this, the virtues of the scientist, those attitudes which make science possible, include truthfulness, honesty, integrity, humility, patience and cooperation – to name some that seem to appear on nearly every list. These are Christian virtues, taken over by science and maintained within science even though science has departed from its Christian origins. And even though there are some scientists who will deny the value of these virtues, they continue practising them.

Yes, even in the denial of Christianity which is so prevalent today, science continues to bear the marks of its Christian origin. Indeed, to try to remove the Christian parts of science would utterly destroy any possibility of science.

NOTES AND REFERENCES

1. Albert Einstein, *Ideas and Opinions* (New York: Crown Publishers, Inc., 1954), p. 39. This is a quotation from an earlier period, 1930. Einstein later modified his view, giving religion the area of values and science the area of facts, asserting that there could then be no conflict. But conflict arises if the absolute truthfulness of the Bible is insisted on.

2. Galileo, *Letter to the Grand Duchess Christina,* in Stillman Drake, *Discoveries and Opinions of Galileo* (Garden City, N.Y.: Doubleday Anchor Books, 1957), pp. 182f.

3. Plato, *Timaeus,* 27-30, 41, 52f; *Phaedo,* 75; *Republic,* 6:509-7:519; 7:529f, 533f; in *Great Books of the Western World,* 7:446-8, 452, 457f, 229, 386-390, 395f, 397f.

4. Aristotle, *Posterior Analytics,* I, 30, 87b18-26; *Metaphysics,* II, 3 995a15-20; VI, 2 1026a33-1027a28; VII, 15, 1039b20-1040b4: 17, 1014b5-11; XI, 2. 1060b20-23; 6, 1062b11-1063b35; *Nicomachean Ethics,* VI, 3, 1139b14-15, 1140b30; in *Great Books,* 8:119, 513, 548f, 563f, 565, 588, 590f,; 9:388f.

5. Aquinas, *Summa Theologia,* Part I, Q 12, A 4, Ans.; Q 14, A 13, Ans.; Q 56, A 1, Rep. 2; Q 57, A 1, Obj. 3 and Rep. 3; Q 57, A 2, Obj. 1 and Rep. 1; Q 84, A 2, Ans., Par. 3; Q 86, A 1 and 3; in *Great Books* 19:53, 87, 292, 295, 295-7, 443, 461f, 463.

6. Aristotle, *Metaphysics,* I, 6, 987a32f; in *Great Books* 8:505.

7. Lucretius, *De Natura Rerum,* II, 1058-1062; in *Great Books,* 12:28.

8. Alfred North Whitehead, *Science and the Modern World* (New York: The Macmillan Company, 1948), p. 18.

9. See Joseph Needham, *Science and Civilization in China* (Cambridge: University Press, 1954-), 1:146f, 2:214f, 286f, 163, 283f, 518, 561f, 579f, 582f.

10. Quoted by Edwin Arthur Burtt, *The Metaphysical Foundations of Modern Science: A Historical and Critical Survey* (London: Routledge and Kegan Paul, 1950), p. 72.

11. Quoted in A. C. Crombie, *Medieval and Early Modern Science* (Garden City, N.Y.: Doubleday Anchor Books, 1959), 2:188.

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EVOLUTION and BIOLOGY in a Christian High School

WILLIS A. OLSON*

A Christian high school is more than a school having Bible classes and chapel. Rather than being a place of censorship it is an institution that meets the ideas and problems of the modern day and offers the help of a Christian faculty to students as they wrestle with the ideas and problems. In such an environment the issue of evolution is met. This author contends that evolution may be the process of how God made the living creatures. This is consistent with Christian thought as to how God made the living creatures, and with Christian thought as to how God answers prayer and fulfils prophecy — that is, the doctrine of Providence.

Not all subjects that we teach in high school have equal opportunity for conflict or seeming conflict with the Christian faith. One would not expect much of a problem with mathematics and the Christian faith, or industrial arts and the Christian faith. But we find the fields of history, social problems, and biology much more sensitive to these difficulties. In our thinking today we are especially concerned with the science of biology because the theory of evolution has such a central position in it. We are all acquainted with the storms of controversy that have surrounded evolution from the days of Darwin and Wallace. Much of the opposition has been from those who have held to the traditional faith of the church. How can this subject be handled in a Christian high school?

In considering this subject it is first necessary to define more clearly what we mean by a Christian high school. Some may think that it merely is an ordinary high school with chapel and Bible study added. This concept of a Christian school is probably held only by people not too well acquainted with an actual institution. A Christian school does have chapel and Bible classes, but it is Christian in a much more profound and thorough going way. The admissions policy and discipline are affected by the Christian character of the school as are also the various subjects that are taught. History from the Christian point of view is a much more complete history than that which leaves out important segments because they deal with religious matters. The very best in music is the great music of the church. How can we adequately discuss the great social issues of our day and leave out the relevance of our faith to them? Science is more meaningful and soul-stirring when we recognize that we are but thinking the thoughts of God after Him.

There are others who think of the Christian school as a school where the church acts as a censor to make sure that its students come into contact only with those ideas that are "safe" for one who professes to be a Christian. It is true that this concept is one that might be adhered to by certain schools and churches. But we here in this school reject that concept for very good reasons. In the first place, if the Christian faith has something wrong with it so that it cannot compete in the world of ideas we ought not keep the truth from youth and foist on them a lie! In the second place, our censoring of ideas would prove to be futile. In our modern day of communication the students would come into contact with the ideas anyway. Then, our young people would suspect there was something wrong with the Gospel we proclaim if we tried to keep them from hearing anything else. We recognize the basic dishonesty and futility of that kind of so-called "christian" school.

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It is our philosophy that a Christian school is one which stands fully committed to the Christian faith not only in chapel and Bible class but throughout the entire curriculum. We do not seek to divide ideas and activities into that which is secular and that which is sacred. There is a sacredness even about the common things of life and the Christian faith has relevance to some degree at least in every field of study. The Christian school is not the censor of ideas but rather it furnishes the kind of environment where students can meet ideas, even those which oppose the Christian faith, but where the student can see them in their proper perspectives. Let me quote from the Philosophy of Education of Minnehaha Academy.[1]

> We believe it essential to the maturing of the Christian personality that the student be exposed to a realistic view of other standards and philosophies, even though they may be in conflict with the Christian point of view. In the light of this objective, we will not omit from our curriculum the use of materials and resources which present a sincere picture of man and his condition even though these may appear to conflict with the Christian ideals and faith.
>
> We believe that a liberal education, particularly at the upper grade levels, should include an encounter with the realities of non-Christian societies and that the ideal situation for such an encounter occurs under the guidance and interpretation of a Christian teacher.
>
> Although Minnehaha Academy is unequivocally committed to the Christian faith and world view, we see our protective role as a Christian school not as a shelter from the world in which we live, but as a "companioning" role with the student as he makes his encounter with opposing idealogies of a world in which Christ is not yet known.

Note that we believe that the role of the teacher is that of a guide and companion to the student as he struggles in the world of ideas. Certainly there has been struggle with the idea of organic evolution.

At Minnehaha Academy we do not avoid the issue of organic evolution and its seeming conflict with traditional conservative Christian belief. We do not have to avoid it because in the classroom we have the freedom to speak of Scripture and theology as well as the evidences for evolution. In the state schools the teacher may teach the evidences for evolution but because of the separation of church and state he may not discuss Scripture and theology. *Yet it is just at this point that the student needs help!* Frankly, I do not see how a public school teacher can adequately handle this problem in the classroom. The other resource of help for the student is his pastor. In some cases the pastor is well equipped to help the student but, in too many cases, though the pastor knows Scripture and theology, he does not know science. Too often the pastor's response is to throw out of court the evidences for evolution. This is a most dangerous course. Pastors would do well to engage in some serious study of biology. They should do this at a university where they could come into direct contact with ideas prevalent in the biological world today. They should not omit the laboratory portion of the work if they would understand the problems that their young parishioners have. Reading a book about the subject is not enough to prepare the pastor to help these earnest young people. We must not lose this vital intellectual battle.

At this point I want to say that the particular views that I am about to express are not necessarily those of the administration of Minnehaha Academy or of other teachers on the staff. They are my own. Though I have heard approval of some of my ideas by my colleagues, this paper is by no means an official pronouncement of the school on the subject. We have academic freedom here as long as it does not violate our Christian commitment.

As a practical matter evolution is not handled extensively early in the course. One cannot avoid referring to it because it is such an integral part of biology, but the main study of it does not occur at this time. It is my judgment that the student at that point usually does not have sufficient background to have a basis for judgment in these matters. Too often they have opinions based on mere hearsay from a variety of sources – some dependable, others wildly conjectural.

As the school year passes and various organisms are studied, observations are made concerning differences and similarities in anatomy, development, and physiology. The very systems of classifications are reminders of these similarities and differences. One need not repeat here the classical data upon which the theory of evolution is based. It is sufficient to say that among the important parts of the biology course are those experiences that a student has as he comes face to face with the actual objects of biology in the laboratory. After such experiences it is not easy to lightly cast the ideas of evolution aside. Nor do we think that he ought to! One of the basic things about being Christian is being *honest!*

It is late in the school year when special attention is given to the ideas of evolution. By this time the student has had considerable contact with the objects of nature which suggest evolution. He has dissected animals and plants. He has looked at fossils and tried to understand their great age. He has gotten a taste of genetics and heard of DNA and heard also of possible mechanisms which might result in evolution. It is to be expected that about this time that some students show concern about what they have learned from science and what they have learned from teachers of religion. Too often they have heard from some people the alternatives "evolution" or "creation". That these might not be opposites has not occurred to many. Even some of the "secular" textbooks indicate that these are the choices. One either believes in evolution or he believes in special creation.

It is my contention that truth does not really conflict with itself. But our comprehension of it *may*, due to the fact that man's knowledge at best is fragmentary and partial.

There is no doubt in my mind of the truth of the

Scriptures and the Christian faith. The resurrection of Jesus Christ from the dead has forever settled this matter. God is the Creator and the Book of Genesis is inspired of God. Anyone who is a Christian must necessarily also believe in creation.

On the other hand the evidence is strong that evolution of living things to our modern species has actually occurred. It is the simplest and most satisfying response to that which we observe in nature. This is not the place or time to argue the case for it. The literature is easily available to anyone in this country who wishes to investigate it. In parentheses let me say that Christians ought to thoroughly investigate it before making statements about it. To condemn evolution without investigation is to be guilty of the same sin as those who crucified Christ. They crucified Him for blasphemy when He claimed to be the Son of God. Had they investigated they would not have crucified Him. The evidence was available. To go on – The question before us today is how we handle the problem of evolution in the setting of the Christian school.

In my own classes I do not insist that the students accept the solution which I have worked out for myself. (And some do *not* accept it.) But I offer it as a *suggestion* as to how they might solve their problem. It is the old idea that God may use evolution as a *process* in producing the species that we have today.

That God would work this way is not at all foreign to Christian thought. Throughout the years there have been Christians who have believed that though men act freely and independently and though natural things function according to the mechanistic laws of the physical universe, behind it all is the sovereign hand of God who guides all according to His will.

Anyone who has prayed and accepted the falling out of circumstances in a singular way as an answer to his prayers should not have problems with accepting the idea of the same hand of God in using natural laws to bring about the variety of species which have arisen. After all, who made natural law?

In a like manner anyone who can believe that human history shows the providential finger of God, should not have trouble with the idea. Certainly those who believe in prophecy must recognize that God can work even through agents who do not recognize Him. Remember it was Caesar who gave the command that the world should be enrolled for taxation. This was the apparent human reason that Christ was born in Bethlehem rather than in Nazareth, thus fulfilling the word of the prophet, Micah.

Of course, such an interpretation raises questions. Usually the most insistent one is in regard to the origin of man. In this area I do not pretend to have the competency of an anthropologist. However, all the evidence at hand in regard to the physical nature of man – and, to some degree, mental and emotional nature – indicate relationship to other animals. Else, why test drugs on animals before testing them on man? Why use animals for experimentation in psychology? Isn't it the whole point that animals are *similar* to man in some respects? Our bodies need the same materials as other living things and therefore we use both plants and animals for food. I can see no good reason why in these aspects we cannot accept that man is one with other protoplasmic creatures.

However, as Christians we recognize that man is far more than a mammal with a highly developed central nervous system. Man is a spiritual being. Again, here our faith looks to the resurrection of Christ. In the book of Genesis, did not God take a physical being and breathe into its nostrils the breath of life and that being became a living soul? Certainly, to my mind, the origin of *spiritual* man indicates special creation.

The question arises as to why the early part of Genesis gives the story of creation in the form in which it is given. Who am I to answer for God? But it occurs to me that the story of Genesis is written to all men everywhere of all periods of history. It seems to me that the Holy Spirit has chosen words which would make sense to people of early Babylonia, Palestine, Eygpt, Medieval Europe and modern America. The cosmologies of peoples have been vastly different in the past from those accepted by modern man. And yet God wished to speak to them also. Genesis gives the story so all may know that God is the Creator.

This is the kind of reasoning I use with my students when we consider evolution and the Christian faith. It is the kind of thing that cannot be done in a public school because of the doctrine of separation of church and state. I hope that my attempt to help students will result in candidness in working with scientific data and at the same time result in increasing devotion to our Lord Jesus Christ.

REFERENCES
1. *The Philosophy of Education and Statement of Objectives,* Minnehaha Academy, Minneapolis, Minnesota; page 1, Affirmations, paragraph 6.

Editor's Note:

The Journal seeks to present all viewpoints on controversial subjects. The questionnaire sent to A.S.A. members revealed a wide diversity of opinion about evolution. In a forthcoming issue there will be a paper questioning the theory. Letters to the editor can express your viewpoint, too, so do not hesitate to write your reactions. So far as space permits, letters will be published as soon as possible.

BRAIN WAVES

E. V. CRANE*

The paper represents an ingenious attempt to interpret and apply existing information concerning brain waves by several interesting hypotheses which the writer sets forth.

LARS I. GRANBERG,
Contributing Editor for Psychology

Materialism may be subjected to reconsideration as a mentally congesting or blocking concept. Like the concept of a flat earth, it seems to have befogged progress for a time. Perhaps some of it still persists. Entities like electrons, which are intangible to those senses serving the voluntary system, seem difficult for many to visualize.

Science however, has been making its greatest progress among such things, including all the space-force relationships which are known by what they do. Electrical forces within an atom or a brain cell, or sweeping along a power line or through the space about us as radio or TV carriers, are among these. Science courses now seek to introduce more and more students to the utility and technical behavior of such forces. The inescapable question before us has to do with the contributions of these rather intangible space-force relationships to spiritual assurance and experience. Spiritual forces are also known to many by what they do. Yet some doubt them or even deny them.

Materialism may well have been a spontaneous and rather subconscious reaction. Psychotic fear of critical sensed evaluation from one's own autonomic endowment generates such mental conflict. As such it may smolder, handicapping a valuable mental asset. We need a way of demonstrating their own potential to students who have not studied mental science and its electrochemistry.

A technical term which may need explanation is electronics. It comes from the name of the very small but finite electron, the negatively charged particle present in all matter, all life and all electrical activities. Electronics deals particularly with the science of what electrons do.

Let us assume as quantity X, a lecture describing a distinguished personality. This lecture could of course be transmitted from the mouth of A to the ears of B, C etc. Parts of it may be stored away in the brains of these listeners.

In these days the lecture may also be changed by a microphone into an electronic pattern. This form of it may be recorded or "attached" to the electrochemical structure of a magnetic tape. Later it may be "put on the air" to be transmitted through space to a larger audience or even to a distant satellite.

The personality, as described, thus becomes an entity in space. It might travel millions of miles. It is real, but inaudible and invisible, except as a suitable receiver might be tuned to change it back into sound waves. Such things are all about us.

Consider next the electronic mental assets of the distinguished personality himself.

That which he had learned or observed, came to him as sound waves, light waves, heat waves or odor waves, Fig 1. All of these had to changed as they arrived, to electronic patterns, Fig. 2 and 3. These were transmitted by and to the electrochemical brain cells, Fig. 4, which would store and use them. The natural equipment is just more compact and efficient than the commercial equivalents used in case X.

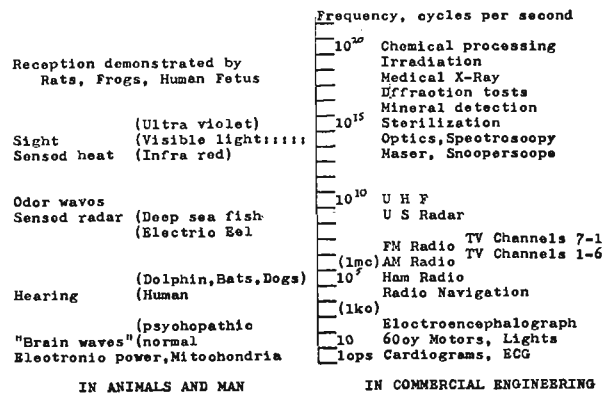

Fig. 1. The electronic spectrum of natural power and message transmissions; and of similar ranges used commercially.

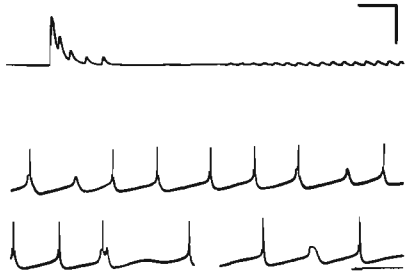

Fig. 2. The signal which directs one measured beat of a heart muscle, is recorded in the upper curve. It comes from a specific inner brain cell which uses up to 0.027 volts of electronic power during about 0.9 seconds. Other curves below it are typical pulses of power sent out by other brain cells, as parts of message carrier waves. Curves, courtesy Dr. Theodore Holmes Bullock, Dr. Carlo Tersuolo and the AAAS, Science 17 Apr. 1959.

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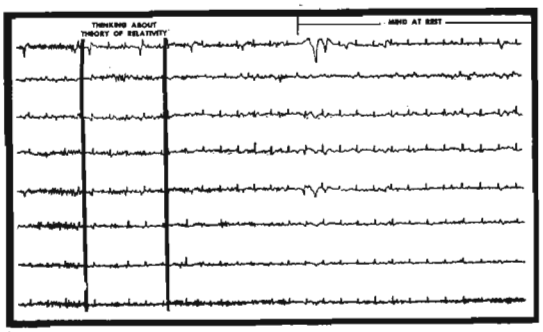

Fig. 3. Electronic activity in Albert Einstein's brain recorded when he was thinking of relativity first, and then when he was consciously relaxed. Many of the ten billion brain cells may be in action at the same time for both voluntary and involuntary purposes. The eight receiving points outside of the skull, merely scramble groups of wave signals from within. Courtesy of LIFE.

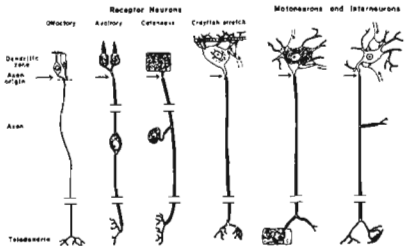

Fig. 4. Typical neurons, living cells with their receiving and transmitting fibres. The cell bodies take in the nourishment they need and expel their wastes. Their complex electrochemical body with a genetic nucleus, stores energy and electro magnetic patterns until needed. The illustration, courtesy of Dr. David Bodian and the AAAS, Science 3 August 1962.

The point of view which made him a distinguished character has also become a part of this electronic record. The disciplined self determination which earned him distinction is exercised as conscious Self may will it. This distinctive conscious group of brain cells is organically quite apart from the subconscious memory group above it, and from the automatic endowment below it at the heart of the brain.

This last asset provides motivating, evaluating, adjusting and stabilizing services. Its electronic activities continue even while consciousness is relaxed in sleep. Without it life would not continue to exist. It is also known by things it does, Fig. 5, 6. Medical research calls it autonomic. Psychology calls it instinctive or unconditioned. Early wise men considered it a Divine gift. The recalcitrant would dismiss its sensed drives and evaluations as mere superstition. The student may detect among its activities, elements of what religions consider spiritual.

Some part of this asset had to arrive as an inherited electronic pattern on the electrochemical tape recording of the genes. That chemistry alone, is similar for man, monkey or mouse, but the instructions carried are different. Tiny but finite dimensions of electrons and of the relatively gross chemical structure which serves their material purposes, suggest that a major portion of this endowment may also arrive by some unidentified level of wave transmission. While difficult technical questions remain, Fig. 1 notes areas among the higher frequencies in which fish, rats, frogs and the human fetus demonstrate reception.

The character which made the man distinctive; whether learned, otherwise acquired or personally compounded, has now become an electronic unity. It is more detailed than the lecture to be sure, but it is electrochemically stored in his brain, a finite unity.

X plus Y:- Just as the electronic pattern describing the man could be detached from the chemistry of the tape, for transmission as an entity in space, so also the electronic original might be detached from the chemistry of his brain, either in part for conversation, or as a spiritual entity at death. Scientifically it is quite as conceivable as other electronic conformations in space. Z, the sum of X + Y, might even be examined further. Recall that in dreams, the integration of inner electronic signals can produce images of faces and places in the "minds eye" area at the back of the brain. Some we recognize. Some are strange. This electronic accomplishment at least suggests that two such personality aggregations as Y, disembodied in space, might well recognize each other and communicate. Such a concept of surviving spiritual entities in space, is quite as soundly founded as the early "visions" of the submarine, the flying machine and the space ship have now proved to be. There is ample support in current technical theory.

Electronics in space assume ever widening clarity. Electronic storms from the sun threaten astronauts. The finite but transparent Van Allen rings about the earth, have electrical capacity to protect earthlings from the measurable violence of such space storms. Yet the patterned entities of radio message transmissions have successfully traversed such competition for tremendous distances. In return, powerful radiofrequency and X-ray beams from distant star areas are now being studied as well as present instruments will permit.

Each of us, as we begin to think for ourselves, will seek to get the whole problem in perspective. *Relativity* is properly relating *all* contributing factors. Among the checks and balances provided within us, should either our physical, mental or sensed spiritual components be neglected? Among the materials of our construction can the chemical, electronic and magnetic reality in all things be overlooked? As we struggle to understand the basic laws of science, of nature and of behavior, can the overall unity thereof be successfully evaded?

The extent to which the finite electronics and the nonconscious services of mentality may help each of us to understand our spiritual experiences, will remain a personal matter. One educator stated with apparent self conviction that the hoary word spiritual "has no meaning". To others of us it remains a vitally present and valued reality. An open minded stance would appear to invite history, science and worthy experience to make their contributions to each of us. Or perhaps we will have to learn the hard way, as I did.

(Continued from p. 77)

halt ist eine Verbindung von Gegenständen (Sachen, Dingen)" – 2.0, 2.01). Of course, theories can themselves become the substantive grist for the mill of higher level theory, but this in no way lessens the need to distinguish sharply between that which is to be explained (*explicandum*) and that which does the explaining (*explicans*).

17. Toulmin, *The Philosophy of Science,* p. 43.

18. R. B. Braithwaite, *Scientific Explanation: A Study of the Function of Theory, Probability and Law in Science* (Cambridge: Cambridge University Press, 1955), p. 368. Braithwaite, it should be noted, is a much more helpful guide in the realm of scientific explanation than he is in the field of theological analysis; in his book, *An Empiricist View of the Nature of Religious Belief* (Cambridge: Cambridge University Press, 1955), he argues the position, grossly inapplicable to the Christian faith, that religious affirmations are meaningful only ethically, not cognitively.

19. Georg Henrik Von Wright, *The Logical Problem of Induction* (2d ed.; Oxford: Blackwell, 1957), p. 174.

20. Joseph Agassi, *Towards an Historiography of Science* ("History and Theory Beihefte," 2; The Hague: Mouton, 1963).

21. Kepler's discovery of Mars' orbit is a particularly good illustration. On the influence of Kepler's Reformation theology upon his scientific labors, see my essay, "Cross, Constellation, and Crucible: Lutheran Astrology and Alchemy in the Age of the Reformation," *Transactions of the Royal Society of Canada,* 4th ser., I (1963), 251-70 (also published in the British periodical *Ambix, the Journal of the Society for the Study of Alchemy and Early Chemistry,* XI [June, 1963], 65-86, and shortly to appear in French in *Revue d'Histoire et de Philosophie Religieuses*). Cf. W. Pauli, "The Influence of Archetypal Ideas on the Scientific Theories of Kepler," in C. G. Jung and W. Pauli's *The Interpretation of Nature and the Psyche,* trans. Hull and Silz ("Bollingen Series," 51; New York: Pantheon Books, 1955), pp. 147 ff.

22. See Arthur Pap's chapter on "Deductive & Inductive Inference" in his posthumously published work, *An Introduction to the Philosophy of Science,* with an Epilogue by Brand Blanshard (Glencoe, Ill.: Free Press, 1962), pp. 139-50.

23. Max Black, "The Definition of Scientific Method," in his *Problems of Analysis: Philosophical Essays* (London: Routledge & Kegan Paul, 1954,) p. 23.

24. Nash, *op. cit.,* p. 324.

25. Aristotle, *Prior Analytics,* ii. 25; cf. *Posterior Analytics,* ii. 19.

26. C. S. Peirce, *Collected Papers,* Harvard ed., V, para. 146, 171. It should go without saying that acceptance of the Peirce-Aristotle retroduction concept in no way commits one to Peirce's pragmatic philosophy; I myself have argued strongly against pragmatic epistemologies in my book, *The Shape of the Past: An Introduction to Philosophical Historiography* ("History in Christian Perspective," I; Ann Arbor, Mich.: Edwards Brothers, 1963), pp. 320-29.

27. N. R. Hanson, *Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science* (Cambridge: Cambridge University Press, 1958), pp. 87-90; Hanson, following Peirce, illustrates reproductive inference by the classic case of Kepler's theorizing to an elliptical orbit for Mars. With the "bird-antelope," cf. Wittgenstein's detailed philosophical analysis of the psychologist Jastrow's ambiguous "duck-rabbit" (*Philosophical Investigations,* ed. Anscombe and Rhees [New York: Macmillan, 1953], II. xi. 194 ff).

28. Hanson, *op. cit.,* pp. 89-90. Readers of the present essay who wish to delve further into the nature of scientific theorizing are encouraged to consult J. O. Wisdom's bibliographical article, "The Methodology of Natural Science: Publications in English," *La Philosophie au milieu du vingtième siècle,* ed. Raymond Klibansky (4 vols., 2d ed.; Firenze: La Nuova Italia Editrice, 1961-1962), I, 164-83.

29. It is John A. Hutchison's great mistake that he stops here in analyzing the scientific aspect of Christian theology, thereby leaving his reader with the impression that the Christian religion is no more capable of objective validation than are any of the other competing world faiths (*Language and Faith; Studies in Sign Symbol, and Meaning* [Philadelphia Westminister Press, 1963], especially pp. 244-47, 293).

30. I made this point *in extenso* in the apologetic lectures I delivered at the University of British Columbia on January 29 and 30, 1963; these have been published in a slightly abridged version as a series of four articles under the general title, "History and Christianity," in *His Magazine,* December, 1964 – March, 1965.

31. See, for example, the accounts of Gideon and the fleece (Judges 6), Elijah on Mount Carmel (I Kings 18), and the primary-source testimonies to empirical contact with the risen Christ (Lk. 24:36-43; Jn. 20:25-28; cf. I Jn. 1:1-4).

32. To King Agrippa Paul thus defended the empirical facticity of Christ's fulfilment of prophecy and resurrection: "I am speaking the sober truth. For the king knows about these things, and to him I speak freely; for I am persuaded that none of these things has escaped his notice, for this was not done in a corner" (Acts 26:25-26). Peter's Pentecost sermon contains the significant lines: "Men of Israel, hear these words: Jesus of Nazareth, a man attested to you by God with mighty works and wonders and signs which God did through him in your midst, as you yourselves know. . ." Acts 2:22; cf. F. F. Bruce, *The New Testament Documents; Are They Reliable?* [5th ed.; London: Inter-Varsity Fellowship, 1960], pp. 45-46).

33. It might seem that such a general statement would not apply to Islam; however, see my article, "The Apologetic Approach of Muhammed Ali and Its Implications for Christian Apologetics,"*Muslim World,* LI (April, 1961), 111-22 (cf. author's "Corrigendum" in the July, 1961 *Muslim World*). No world religion other than Christianity stakes its life on the objective historical facticity of its claims; only the Christian faith dares to make such an assertion as Paul's: "If Christ has not been raised, then our preaching is in vain and your faith is in vain" (I Cor. 15:14).

34. At the outset of his *Kirchliche Dogmatik,* Barth argues: "If theology allows itself to be called or calls itself a science, it cannot at the same time take over the obligation to submit to measurement by the canons valid for other sciences" (I/1, chap. i. sec. 1). This unwarranted opposition between theology and science directly relates to Barth's scripturally illegitimate distinction between "salvation history" (*Heilsgeschichte*) and ordinary history (*Historie*), to his unqualified rejection of natural revelation, and to the church-directed, anti-apologetic thrust of his entire theology. I have maintained elsewhere that Barth's fundamental difficulties here stem from his over-reaction to Protestant modernism and to his fear of subjecting the Christian faith to the secular examination for which John 1:14 constitutes a specific mandate ("Karl Barth and Contemporary Theology of History," *Evangelical Theological Society Bulletin,* VI [May, 1963], 39-49). Gordon H. Clark, in his excellent work, *Karl Barth's Theological Method* (Philadelphia: Presbyterian and Reformed Publishing Co., 1963), chap. iii, points up Barth's irrationalistic tendencies, and correctly notes that in citing and arguing against Heinrich Scholz's six scientific norms (*K.D., loc. cit.*), Barth is in actuality opposing the straw man of nineteenth-century Scientism (Scientific Positivism), not genuine scientific method. Unfortunately, Barth has never cared for science (Henri Bouillard, in his *Genèse et Evolution,* reports that even as a boy Barth disliked physics and mathematics); and his *Church Dogmatics* suffers for it on almost every page.

35. Ian T. Ramsey, *Models and Mystery* (London: Oxford University Press 1964), p. 17.

36. Ramsey (*ibid.*) perpetuates a common fallacy when he asserts that theological models differ from scientific models in that the letter must generate experimentally verifiable deductions.

37. Jean Racette, "La Méthode en théologie: Le cours du P. Lonergan au 'Theology Institute' de Toronto," *Sciences Ecclésiastiques,* XV (Mai-Septembre 1963), 293.

38. Paul Tillich, *Systematic Theology,* I (Chicago: University of Chicago Press, 1951), 40.

39. Gerhard Ebeling, *Theologie and Verkündigung; Ein Gespräch mit Rudolf Bultmann* ("Hermeneutische Untersuchungen zur Theologie," 1; Tübingen: J. C. B. Mohr, 1962), pp. 14-15. Cf. James M. Robinson and John B. Cobb, Jr. (eds.), *The New Hermeneutic* ("New Frontiers in Theology," 2; New York: Harper, 1964), *passim.*

40. Heinrich Ott, "Was ist systematische Theologie?," *Zeitschrift für Theologie und Kirche,* Beiheft 2 (1961), pp. 19-46, sec. iii. Ott simultaneously regards "the gospel of Christ" as the subject matter of theology, and here also the dialectic operates: "The Christ event encounters us through the gospel of Christ, but the gospel is encountered through the Gospels and witnesses that are not yet and never will be the gospel itself. What is actually spoken is only the gospel *according to* . . . .,

the gospel according to Mathew, according to Mark, according to Luke, according to John, but also according to Paul, and why not also, dependent on those and secondarily, the gospel according to Martin Luther, Calvin, Rudolf Bultmann, or Karl Barth?"

41. *Ibid.*, sec. v.

42. *Ibid.*, sec. iii. Cf. James M. Robinson and John B. Cobb, Jr. (eds.), *The Later Heidegger and Theology* ("New Frontiers in Theology," 1; New York: Harper, 1963), *passim.*

43. A point brought out with particular force in J. K. Van Baalen's fine work, *The Chaos of the Cults* (Grand Rapids, Mich.: Eerdmans, 1955), which has gone through a number of editions.

44. On this trend, see especially George H. Tavard, who argues that "the authority of the Church's tradition and that of Scripture are not two, but one" (*Holy Writ or Holy Church* [New York: Harper, 1959], p. 244).

45. Cf. W. N. Clarke's critique of philosopher Paul Weiss' *Modes of Being*, which conceives the universe as having four ultimate dimensions of being: the Weissian system "leaves untouched the . . . fundamental and, for a metaphysician, unavoidable problem of the ultimate origin or source of existence and the ultimate principle of unity of this whole with its four irreducible modes" (*Yale Review*, September, 1958). Cf. my review of Weiss' *History: Written and Lived* in *Christianity Today*, VII (July 19, 1963), 43-44.

46. See, for the most influential American example of this approach, Thomas Paine's *Age of Reason*, especially Pt. 2.

47. Whitehead and Russell, in their great *Principia Mathematica*, showed that this is the case both for formal logic and for mathematics – and that the latter is a special case of the former.

48. Joseph Lewis' *The Tyranny of God* (New York: The Freethought Press Association, 1921) is a popular example of an atheism built on the natural evils in the world; here the "Nature" which pointed Paine unmistakably (he thought) to a beneficent Creator points Lewis to a universe having no God at all.

49. See my essay, "The Petrine Theory Evaluated by Philology and Logic," in my *Shape of the Past*, pp. 351-57.

50. I have demonstrated this in detail in my essay, "Constructive Religious Empiricism: An Analysis and Criticism," *ibid.*, pp. 257-311.

51. See especially Bultmann's essay, "The Task and the History of New Testament Theology," included as an Epilogue to his *Theology of the New Testament*, trans. Kendrick Grobel, II (London: SCM Press, 1955), 241.

52. See above, the quotation coresponding to n. 35. I suspect that Ramsey's overstress on religious experience, combined with relatively little emphasis on biblical authority, is an underlying factor in his defense of F. D. Maurice's uncertainty about the doctrine of eternal puishment (see Ramsey's *On Being Sure in Religion* [London: University of London-Athlone Press, 1963], especially chap. i).

53. John Hick, *Faith and Knowledge* (Ithaca, New York: Cornell University Press, 1957), p. 198. For Hick, the "catalyst of faith" – the means of theological structuring the "apperceiving mass" of experience – is "the person of Jesus Christ" (p. 196). but this Christ is not seen in the context of a fully reliable biblical revelation. Thus, in his article "Theology and Verification," Hick can make the amazing statement: "I will only express my personal opinion that the logic of the New Testament as a whole, though admittedly not always its explicity content, leads to a belief in ultimate universal salvation" (*Theology Today, XVII* [April, 1960], 31). In regard to the existence of God, Hick holds the experiential view that "the important question is not whether the existence of God can be demonstrated but whether . . . faith-awareness of God is a mode of cognition which can properly be trusted and in terms of which it is rational to live" (*The Existence of God*, ed. John Hick [New York: Macmillan, 1964], p. 19).

54. See his full-scale treatment of this issue, *op. cit.*, pp. 40-46.

55. Frederick Ferré, *Language, Logic and God* (New York: Harper, 1961), p. 104; Ferre's entire chapter on "The Logic of Encounter" (pp. 94-104) is a masterly critique of much of the wooly "I-Thou," existential-encounter theology popular today.

56. The foregoing criticisms, it is well to point out, also apply to those theologies which attempt to make a "living Christ" (as distinct from the Christ of Scripture) the source of theological theorizing. Such a "living Christ," if He is not known through Scripture, is necessarily known through extra-biblical experience. But, in the latter case, how can one be sure that his "Christ of experience" is the *real* Christ and not a projection of personal or corporate religious needs and desires? The dangers of idolatry here are overwhelming.

57. Limitations of space prevent us from dealing with the question of extra-biblical scriptures which claim to provide the ultimate interpretation of the Bible or revelational data superior to it (e.g., the *Book of Mormon*). Interested readers are referred to Van Baalen (*op. cit.*), where the unverifiable nature of these claims is made patent, and where specific refutation of many of them is given.

58. In my *Shape of the Past* (*op. cit.*, pp. 138-39), I have summarized what I believe to be the crux validation: "1. On the basis of accepted principles of textual and historical analysis, the Gospel records are found to be trustworthy historical documents – primary source evidence for the life of Christ. 2. In these records, Jesus exercises divine prerogatives and claims to be God in human flesh; and He rests His claims on His forthcoming resurrection. 3. In all four Gospels, Christ's bodily resurrection is described in minute detail; Christ's resurrection evidences His deity. 4. The fact of the resurrection cannot be discounted on *a priori*, philosophical grounds; miracles are impossible only if one so defines them – but such definition rules out proper historical investigation. 5. If Christ is God, then He speaks the truth concerning the absolute divine authority of the Old Testament and of the soon-to-be-written New Testament."

59. Franz Pieper, *Christian Dogmatics*, trans, and edd. T. Engelder, J. T. Mueller, and W. W. F. Albrecht (4 vols.; St. Louis, Mo.: Concordia, 1950-1957), I, 142-43.

60. John Warwick Montgomery, "Inspiration and Inerrancy: A New Departure," *Evangelical Theological Society Bulletin*, VIII, No. 2 (Spring, 1965).

61. Robert Preus, *The Inspiration of Scripture: A Study of the Theology of the Seventeenth Century Lutheran Dogmaticians* (Edinburg: Oliver and Boyd, 1957), p. 159.

62. *Ibid.*, p. 157.

63. Introduction, sec. C. 2. a. (p. 7); Traina's italics. This book was first published in 1952 and is available from the Biblical Seminary in New York. Serious application of its principles offers perhaps the best counteractive to such absurdly superficial judgments as Kaufmann's remark on "the overt ambiguity of the Scriptures" (*op. cit.* [in n. 5], p, 227): "In no case can a theology really do justice to the Scriptures because it refuses to take into account their heterogeneity and their deep differences."

64. E. g., the classical Lutheran dogmatician Johann Gerhard (1582-1637), in his *Loci Theologici*, Preuss-Frank ed., I, 237-40.

65. E. g., my esteemed colleague, J. Oliver Buswell, Jr., in his epochal work, *A Systematic Theology of the Christian Religion* (2 vols.; Grand Rapids, Mich.: Zondervan, 1962-1963), I, 24-25. Edward John Carnell has rightly praised Buswell for his "repeated insistence that a univocal meaning unites the mind of God with the mind of a Christian. The defense of univocal meaning implies a forthright rejection of all species of theology, ancient or modern, that either openly assert or tacitly consent to the hypothesis that truth signifies one thing for God (because he is almighty) and another for a Christian (because he is merely human)" (*Christianity Today*, IX [February 26, 1965], 40).

66. Heinrich Ott defends the "hermeneutical circle" as strongly as does Bultmann; see Ott's "Was ist systematische Theologie?" (*op. cit.*), sec. ii. The "hermeneutical circle" approach is, of course, an outgrowth and corollary of Heideggerian existentialism.

67. John Warwick Montgomery, "The Fourth Gospel Yesterday and Today," *Concordia Theological Monthly*, XXXIV (April, 1963), 204.

68. Tillich, *op. cit.*, pp. 50-51.

69. Cf. Jaroslav Pelikan's *The Light of the World: A Basic Image in Early Christian Thought* (New York: Harper, 1962), and *The Shape of Death: Life, Death, and Immortality in the Early Fathers* (New York: Abingdon, 1961).

70. Hick (*Faith and Knowledge*, pp. 198 ff.) distinguishes between "dogmas" and "doctrines": the former "define the religion in question by pointing to the area of primary religious experiences from which it has arisen" (example: The Apostles'

Creed), while the latter are "the propositions officially accepted as interpreting [the religion's] dogmas and as relating them together in a coherent system of thought." This is a useful distinction in practice, but Hick errs at several points in developing it; (1) Not "religious experiences" but the Holy Scriptures are the proper source of data from which Christian dogmas are developed (see above, our text at n. 53). (2) Doctrinal systems are not to be built upon "dogmatic foundations"; doctrines, no less then dogmas, are Gestalts that conceptualize *biblical* data. (3) The difference between dogmas and doctrines does not lie in the "fixed and unchangeable" character of the former as contrasted with the variable nature of the latter (*Both* are theoretically alterable for only scripture is inerrant), nor in the fact that dogmas are formulated by "a descriptive and empirical process" while the construction of doctrines is "speculative in method," involving "philosophical thinking" (*both* are Wittgensteinian "nets" to catch Scripture – not descriptive assertions *or* philosophical speculations). In actuality, the distinction between dogmas and doctrines is *quantitative*: the former are more stable because they are based on a greater wealth of biblical evidence, whereas the latter express theological convictions for which less scriptural support can be adduced. It follows that no strict or absolute line can be drawn between dogmas and doctrines, or between heresy (the rejection of orthodox dogma) and heterodoxy (the rejection of orthodox doctrine). Christian churches, in formulating tests of fellowship, should proceed with great care so as to avoid twin errors of laxity (stemming from an insufficently defined or enforced dogmatic-doctrinal position) and bigotry (the bruising of consciences through required subscription to biblically doubtful doctrines). Thomas Campbell's rule remains the best guide: "Where the Scriptures speak, we speak; where the Scriptures are silent, we are silent."

71. *Absolute* certainty, both in science and in theology, rests only with the data (for the former, natural phenomena; for the latter, scriptural affirmations). All conceptualizations on the basis of these data lack ultimate certainty (in science the Einsteinian revolution helped to make this clear), but some formulations are so well attested by the data that they acquire a practically (though not a theoretically) "certain" status; in science we call such Gestalts "laws", in theology, "creeds" and "confessions". Just as a denial of scientific laws removes one from the scientific community (cf. modern alchemists such as Tiffereau and Jollivet-Castelot), so denial of creeds and confessions results in one's separation from ecclesiastical circles. Scientific hypotheses and theological proposals, however, are never proper tests of "fellowship", for they lie, by definition, in the realm of open questions–which, hopefully, more investgation will either raise to a higher status or cause to be discarded. Scientific "theories" (in the narrow sense) and theological systems occupy an intermediate position between laws/creeds-confessions and hypotheses/theological proposals; thus although they are not generally made the basis of *formal* tests of fellowship, they often have that function on an informal (social or psychological) level (cf. the negative reception in scientific circles of Immanuel Velikovsky's cosmological theories).

It is, of course, possible to develop a more extensive classification of conceptual Gestalts in science and theology (since only *quantitative* differences exist among the respective levels), but the above scheme appears to be the most generally useful; in Roman Catholic dogmatics, at least ten "theological grades of certainty" are distinguished, from "immediately revealed truths" to "tolerated opinion" (see Ludwig Ott, *Fundamentals of Catholic Dogma*, trans. Patrick Lynch and ed. James Bastible [2d ed.; St. Louis, Mo.: Herder, 1958], pp. 9-10 para. 8).

72. On the "Christus Victor" atonement motif, set forth in historical context in Aulén's book of that title (English translation by A. G. Hebert published by Macmillan of New York in 1956), see the Appendix to my *Chytraeus on Sacrifice: A Reformation Treatise in Biblical Theology* (St. Louis, Mo.: Concordia, 1962), pp. 139-46, where I compare the Aulén approach with Anselm's "Latin doctrine" of the atonement and with Abelard's "subjective view."

73. Sherman Yellen, "Sir Arthur Conan Doyle: Sherlock Holmes in Spiritland," *International Journal of Parapsychology*, VII (Winter, 1965), 54.

74. This passage appears in the Preface to the German section of the first edition of Luther's collected writings (Wittenberg, 1539). For an excellent discussion of it, see Pieper, *op. cit.*, I, 186-90.

75. A particularly attractive presentation of this threefold conception of faith is given by Johann Gerhard, *op. cit.* (in n. 64), III, 354 ff. A similar treatment can be found in Martin Chemnitz's *Loci Theologici*, II, 270.

76. Johann Andreas Quenstedt (1617-1688), *Theologia didactico- polemica*, IV, 282. For Quenstedt, as for many of the other classical Protestant dogmaticians, both *Notitia* and *Assensus* pertain to the intellect, and *Fiducia* to the will; however, *assensus* is better regarded as bridging the gap between intellect and will, for, as Chemnitz correctly asserts, it involves "not merely a general assent, but that by which each one determines with firm persuasion, which Paul calls assurance πληροφορία , Heb. 10:22), that the universal promise belongs privately, individually, and specifically to him, and that he also is included in the general promise" (*loc. cit.*).

77. Peter Winch, *The Idea of a Social Science and Its Relation to Philosophy* (London: Routledge & Kegan Paul, 1958), p. 77.

78. John Ciardi, "How Does a Poem Mean?", in *An Introduction to Literature*, ed. Gordon N. Ray (Boston: Houghton Mifflin, 1959), p. 666.

79. Winch, *op. cit.*, p. 115. Winch illustrates with Wittgenstein's hypothetical society where the people sold their wood by piling the timber "in heaps of arbitary, varying height and then sold it at a price proportionate to the area covered by the piles. And what if they even justified this with the words: 'Of course, if you buy more timber, you must pay more'?" (*Remarks on the Foundations of Mathematics* [Oxford: Blackwell, 1956], pp. 142 ff.). To *understand* such behavior, notes Winch, requires much more than the formulation of statistical laws concerning it. ("Understanding" is here used, let it be noted, not in an abstract, purely cerebral way, but in Max Weber's sense of *Verstehen* – "empathic comprehension"; see Talcott Parsons, "Unity and Diversity in the Modern Intellectual Disciplines: The Role of the Social Sciences," *Daedalus: Journal of the American Academy of Arts and Sciences* XCIV [Winter, 1965], 59 ff.)

80. On the historical philosophies of Croce and Collingwood, see my *Shape of the Past* (*op. cit.* in n. 26), pp. 90 ff. Crime detection, like history, is both a science and an art; thus Commissioner Tarquin (see above n. 11) also recommends in the investigation of a woman's murder: "Put yourself inside this woman's skin, get to know her better than she knew herself, become her twin. Get to understand her from the inside out, if you see what I mean" (Japrisot, *op cit.*, chap. iii.).

81. Ernst Cassirer, *The Logic of the Humanities*, trans. C. S. Howe (New Haven, Conn.: Yale University Press, 1961), p. 158.

82. A good beginning can be made with Virgil C. Aldrich's *Philosophy of Art* (Engelwood Cliffs, N. J.: Prentice-Hall, 1963).

83. "In every situation, when 'I' and 'me' have been distinguished. 'I' cannot be given an exhaustive 'objective' analysis without denying ourselves in fact, or without supposing that the subject-object relation in the construction of language is merely subject-predicate, which seems a quite unnecessary, indeed a quite disastrous, assumption. It is what Whitehead calls 'extreme objectivism' which even objectifies the subject" (Ian T. Ramsey, *Miracles; an Exercise in Logical Mapwork. An Inaugural Lecture delivered before the University of Oxford on 7 December* 1951 [Oxford: Clarendon Press, 1952], p. 15). Cf. Karl Heim, *Christian Faith and Natural Science*, trans. N. Horton Smith (New York: Harper Torchbooks, 1957), *passim*.

84. Ramsey, *Models and Mystery*, p. 27: "There can – and it is a logical 'can' – be no objects without a subject which cannot itself be reducible to objects. The ideal of logical completion is never a third-person assertion; it is first-person assertion. *He does X* necessarily carries with it a pair of invisible quotation marks, so that it is to be set in some such frame as 'I am saying . . .', and without this wider frame the third-person assertion is logically incomplete."

85. Cf. my article, "The Cause and Cure of Sin," *Resource*, III (February, 1962), 2-4.

86. "Credimus in" followed by the accusative is the Latin equivalent of Greek πιστεύομεν εἰς . . . , signifying the highest level of faith (*Fiducia*, confidence). Andreae's Creed thus reaches beyond assent to trust, as must all genuine Christian doctrinal affirmations.

87. For the full text of this Creed, with accompanying English translation and detailed analysis, see my (as yet unpublished) dissertation for the degree of Docteur de l 'Université, mention Théologie Protestante: "Cross and Crucible: Johann Valentin Andreae's *Chymical Wedding*" (3 vols.; University of Stras-

bourg, France, 1964), I, 272 ff. As a contemporary example of a theological system manifesting biblically sound artistic-subjective quality throughout, I particularly recommend the late Erlangen professor Werner Elert's *An Outline of Christian Doctrine*, trans. C. M. Jacobs (Philadelphia: United Lutheran Publication House, 1927).

88. Bouwsma, *op. cit.* (in n. 8), pp. 8, 10.

89. Michael B. Foster, *Mystery and Philosophy* (London: SCM Press, 1957).

90. William F. Zuurdeeg, *An Analytical Philosophy of Religion* (New York: Abingdon, 1958).

91. Ian T. Ramsey, *Religious Language: An Empirical Placing of Theological Phrases* (London: SCM Press, 1957), p. 73.

92. Unhappily, as we have seen (the text at nn. 35 and 52), Ramsey makes "religious experience" rather than Holy Writ his touchstone for confirming or disconfirming theological models and their qualifiers.

93. Luther used the expression *Theologia gloriae* to characterize the presumptive, god-like attempts of late medieval scholastic theologians to embrace all reality in their systems; his own approach he designated simply as a *Theologia crucis* ("Theology of the Cross"); see Philip S. Watson, *Let God Be God! An Interpretation of the Theology of Martin Luther* (London: Epworth Press, 1947), p. 78. The scholastics erred through neglecting the *Tentatio* element requisite to the theolgian's activity; their impossible endeavor to theologize from as it were, the perspective of God's throne would not have come about if they had retained awareness of their own subjective involvement in the theological task.

94. E.g., "in the tension between analysis and existentialism" (Walter Kaufmann's philosophical maxim, characteristically endorsed by Willem F. Zuurdeeg in his article, "The Implications of Analytical Philosophy for Theology," *Journal of Bible and Religion*, XXIX [July, 1961], 210). In point of fact, only a solid analytical *base* can keep existential affirmations from dribbling off into unverifiable nonsensicality; thus not a "tension" but a *structure* is required for the proper relating of objective analysis and subjective-sacral existentialism. No better illustration of this exists than Wittgenstein's arrival at "das Mystische" at the end of his *Tractatus Logico-Philosophicus*, and the manner in which this work of logical analysis prepared the ground for his later *Philosophical Investigations*.

95. Bernard J. F. Lonergan, S. J., *Insight: A Study of Human Understanding* (London: Longmans, 1958), *passim*. The Autumn, 1964, number of the Saint Xavier College quarterly *Continuum* is a Festschrift entirely devoted to the exceedingly important work of this Wittgenstein-like professor at Rome's Gregorian University. In matters of theological methodology, Lonergan is far more worth reading than most contemporary Protestant writers on the subject, since he is well aware of the debilitating effect of current existentialism on theological method, and is thoroughly versed in post-Einsteinian scientific theory. Cf. Lonergan's review of Johannes Beumers *Theologie als Glaubensverständnis*, in *Gregorianum*, XXXV (1954), 630-48; and see also the accounts of Lonergan's institute on theological methodology held in July, 1962, at Regis College, Toronto (*Sciences Ecclésiastiques*, XV, 291-93 [*op. cit.*, in n. 37], and F. E. Crowe, "On the Method of Theology," *Theological Studies*, XXIII (1962], 637-42).

96. The mingling of the subjective with the objective is deadly to any scientific theorizing. Theologians who would disregard this fact in their eagerness to existentialize Christian theology might ponder the following quotation from Rupert T. Gould's *Enigmas* (New Hyde Park, N. Y.: University Books, 1965), p. 321: "A novel and interesting theory respecting the origin — wholly, or in part — of Schiaparelli's (Martian) 'canals' was communicated to me in November, 1944, by Dr. G. S. Brock, F.R.S.E. He draws attention to the possibility that some or all of the appearances which the Italian astronomer believed that he had discovered on the Martian disc were actually situated *in the lens of his own eye*, and were symptomatic of incipient cataract.

"It is undoubtedly true that in certain conditions of lighting an image of the lens of the eye (together with any defects which this may have) can be projected on to the object which its owner is observing. Dr. Brock informs me that this fact was first announced by an Austrian scientist c.1842, but was afterwards lost sight of in consequence of Helmholtz' invention of the ophthalmoscope some ten years later. He considers it quite possible that some, at least, of Schiaparelli's 'canals' were caused by light from Mars, reflected from his retina, causing defects in the lens of his eye to be apparently projected on to the planet's disc — and, not improbably, blended with markings actually existing there" (italics Gould's). Whether or not this explanation of the famed "canals" of Mars is sound, it should give pause to contemporary theologians; for not a few of the theological theories of our day reflect the inner life of their proponents far more than the objective revealed truth of Holy Writ.

97. Historically, as is well known, the Church arrived at its Trinitarian doctrine primarily through just such reflection on the christological problem of Jesus' relation to the Father.

98. See Jn. 2:18-22, and cf. my *Shape of the Past*, pp. 138-45. What in our structural model we have called the "Christ-axis" thus becomes the epistemological support for the entire theological endeavor.

99. Jn. 14:16; ἄλλος is sharply distinguished in the Greek from ἕτερος ("another of a different kind") — cf. Gal. 1:6.

100. Mt. 28:19.

101. Hanson, *op. cit.* (in n. 27), p. 144. Cf. Jean E. Charon, *La Connaissance de l 'Univers* (Paris: Editions du Seuil, 1963), *passim*. Lutheran theology has always cautioned against violating revelational paradox, while Roman Catholic and Calvinist theologies have emphasized the need of achieving maximum rational consistency in doctrinal construction; the above parallel between the Trinity and PWh illustrates the complementary truth in the two views: the theologian must always strive for rationality in his theorizing, but he must sacrifice this ideal to the accurate "fitting of the facts" when the latter do not permit logically consistent formulation. Reason properly has a ministerial, not a magisterial role in theology.

102. Luther, *The Small Catechism*, Arts. 1, 2, and 3 of the Creed.

103. Cf. Ramsey, *Religious Language*, pp. 174-79.

104. Cf. Jacques Maritain, *St. Thomas Aquinas* (London: Sheed, 1931), pp. 44-46, 51. The eminent Jesuit philosopher Frederick Copleston writes: "The Christian recognizes in the human nature of Christ the perfect expression in human terms of the incomprehensible Godhead, and he learns from Christ how to think about God. But at the same time it is certainly no part of the Christian religion to say that God in Himself can be adequately comprehended by the human mind. And that He cannot be so comprehended seems to me to be at once a truth vital to religion, in the sense that it prevents us from degrading the idea of God and turning Him into an idol, and a truth which follows necessarily from the fact that our natural knowledge begins with sense-experience. For my own part, I find the thought that the reality, the 'objective meaning,' far exceeds in richness the reach of our analogical concepts the very reverse of depressing. St. Paul tells us that we see through a glass darkly, and the effect of a little linguistic analysis is to illuminate the truth of this statement" (*Contemporary Philosophy: Studies of Logical Positivism and Existentialism* [London: Burns & Oates, 1956], pp. 101-102).

105. *Tractatus Logico-Philosophicus*, 6.54. On the famous concluding assertion (7.0) that immediately follows, Foster (*op. cit.* [in n. 89], p. 28), perceptively comments: "When Zechariah says 'Be silent all flesh before the Lord,' this is not wholly different from Wittgenstein's 'Whereof one cannot speak, thereof one must be silent'."

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12. Burtt, *op. cit.*, p. 298.

13. Francis Bacon, *Great Instauration*, in his *Works* (Spedding), 8:34f; cf. 14:101.

14. Bacon, *Advancement of Learning*, Bk. I, V, par. 11, 6:134. Also in *Great Books*, 30:16.

15. Edgar Zilsel, "Genesis of the Idea of Modern Progress," *Journal of the History of Ideas*, 6:325-349 (1945). Reprinted in Philip P. Weiner and Aaron Noland, eds., *Roots of Scientific Thought: A Cultural Perspective* (New York: Basic Books, Publishers, 1957), pp. 251-275.

This, and the following references, are found on pp. 333, 337, 338, 339, 341f, 343f, 345, and 348 of the journal, or pp. 259, 263, 264, 265, 267f, 269f, 271 and 274 of the book.

BOOK REVIEWS
(Continued from p. 83)

MAN IN COMMUNITY

A Study of St. Paul's Application of Old Testament and Early Jewish Conceptions of Human Solidarity, by Russell Philip Shedd; Grand Rapids, Mich. William B. Eerdmans Publishing Company, 1964. 209 pp., $1.95 paperback.

This is a most deceptive book. With an innocuous title, and an unassuming paperback form, it appears to be anything but the scholarly and erudite work it is. With this note of caution, may the reader anticipate a challenging experience.

Born of missionary parents, Dr. Shedd received his education at Wheaton College, Faith Seminary and the University of Edinburgh. *Man in Community* is a modified form of the Ph.D. dissertation he wrote at Edinburgh.

While raising the question of human solidarity, Shedd provides a thoroughly biblical conception of ecumenism and the nature of a religious community. The work supplies a highly integrated argument beginning with the Old Testament view of community in Part I and linking this with the Pauline conception in Part II. To travel with Shedd on the path he outlines, one should be conversant with Hebrew, Greek, and reformed theology. Lacking such tools, as was the case with this reviewer, one feels somewhat cheated. Nevertheless, the organization is precise, the style lucid, the thesis clear, and the tightly structured presentation illuminating.

Shedd stresses the organic nature of the Israelite society. Centered in the family, it extends to other generations providing a temporal dimension to the community. Unity was of great importance to the Israelites and took the form of a "corporate personality".

Nevertheless, the community was not exclusive and provision was made for its extension beyond the organic bounds of the tribes. As a contract, the convenant was the main instrument providing for the inclusion of others into the community. By this means, the world view of the Israelites which accepted the unity of all humans because of their common creation and sin could be justified.

Beginning with creation, Shedd proceeds to show that Pauline theology carries these concepts of the unity of mankind into the New Testament. Paul uses the corporate personality of the group to extend the principle of solidarity to include the doctrine of redemption. Through Christ, the solidarity of men is completed and finds its expression in the church as the final expression of community. Faith and Baptism are likened to the means used to initiate aliens into the covenant of the Israelites. The cycle is complete, and the community, based on the nature of the church (New Israel), is inextricably entwined with the principles of ecumenism, based on the nature of man (New Humanity).

This book is reminiscent of two classics in the sociology of religion, Robertson-Smith's *The Religion of the Semites*, and Durkheim's *The Elementary Forms of the Religious Life*. While all of these books stress the organic nature of the religious community, Shedd goes beyond the scope of Robertson-Smith, acknowledging his debt as he proceeds, and avoids the easy conclusions of Durkeim, with whom he was probably not familiar. What is unique to Shedd is a humanistic bent which provides a useful balance to a totally organic position. Man is not simply a member of a religious community; he is in the same dependent, depraved condition as all other men.

Unfortunately, the theological frame of reference employed here weakens the sociolgical utility of the book. Nevertheless, its value to the evangelical Christian should be clear. In a day when ecumenism is all but a closed case, Shedd's definition stands as a useful and significant contribution to conservative position. Too often ignored, however, is the notion of the church as a community of believers. The relevance of such a concept in our society is not completely clear, but the need for identification with community is emphatic. This book should provide much illumination on this topic. Certainly, a more biblical and profound statement will not be forthcoming in the near future.

Reviewed by Russell Heddendorf. Assistant Professor of Sociology, Geneva College, Beaver Falls, Penna.

Letters to editor:

Because of lack of space the few letters received will be postponed until a forth coming issue.

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