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I.Q.

Intellectual Quality? Individual Quirks? Identity Questions?

The first in a new series by Mary Stewart Van Leeuwen

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"The fear of the Lord is the beginning of Wisdom." Psalm 111:10

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I.Q.ism and the Just Society: Historical Background

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"Should you be punished for being born with a high I.Q.?" This was the bait printed on the lower left-hand corner of a piece of bulk mail I received not too long ago from the publishers of an east-coast based magazine which prides itself on being "the Battlefield of the Mind." The question was apparently meant to be rhetorical (the answer presumably obvious when its object was anyone with a departmental address in a university); its aim, even more obviously, was a subscription renewal, so that I might not miss, even for a month, the magazine's "friction and exchange of exceptional minds," "unorthodox thinking," and "courage of words." Having duly renewed my subscription (although not at the behest of this particular ad, which strongly tempted me to cancel it) I was further enjoined, a few months later, to give the magazine "to your (*sic.*) three most intelligent friends for Christmas, and give the rest something less demanding."

It seems clear that the advertising craftsmen of Madison Avenue know the sales value, at least in certain circles, of an appeal to exceptional intelligence. Indeed, there exists an international organization, *Mensa,* whose membership is open only to persons whose I.Q.'s are in the top 2% of the general population, and whose branches now span almost eighty countries and include some 50,000 members. Its advertising literature, with its forthright appeal to intellectual élitism, is very much the same genre as that employed by the magazine referred to above:

> Intelligent people like talking to others who speak their language...*Mensa* can fill a void for some people who may be intellectually or geographically isolated from kindred spirits. Good conversation is perhaps the most notable feature when *Mensans* meet...New *Mensans* frequently remark that they enjoy the enlightened, tolerant atmosphere which allows for a broad base of conversation: they find that they are challenged and, most important, understood.[1]

These kinds of appeals to "intelligence" are always highly connotative. The precision of definition one might reasonably expect of highly intelligent people seems to desert many of them when intelligence itself is the object of discussion. In addition, there is never any reference to any of the long-standing questions about intelligence that circulate perennially in the field of psychology, the birthplace of I.Q. testing and the locus of virtually all the research and theorizing about intelligence that has taken place in the past century. These questions include the following:

This novelty of the 19th century has too often become a tool for the overly-hasty, overly simplified mass sorting of people into crude categories.

1. Is intelligence a "general" aptitude that affects performance uniformly in all domains, or is it more a set of "specific" skills that may or may not be inter-related?

2. Is intelligence something whose definition is (or can be) universalized, or must it be culturally relativized, in part or in total?

3. Does intelligence encompass purely cognitive, problem-solving and information-processing skills, or does it also include any or all of social, artistic, and even moral capacities?

4. Is intelligence measureable, and if so, what are the real-life criteria for validating such measures, and how can we be sure that such measures are reliable?

5. Finally, there is the question that has been posed and argued from the days of the pre-Socratics[2] right through to the present writings of Arthur Jensen and Edward O. Wilson and their respective critics—namely, is intelligence (assuming that we can first agree as to what it *is*) primarily the product of nature or nurture—of genetic inheritance, or of post-natal socialization?[3]

It is my purpose in this series of articles to deal with each of the above questions in a manner informed by both my training as a psychologist and my commitment to a Christian world-view. Inasmuch as my major audience are fellow Christians who are academics and professionals, my reasons for embarking on such a task are three-fold. First of all, the whole area of intelligence test construction, application, and interpretation constitutes an issue that has had (and continues to have) very volatile social and economic implications in North American society. This is reason enough for Christians to become informed of at least the broad outlines of the field, its history, and its current debates. Secondly, for Christians who recognize that all scholarship is undergirded by, and reflective of, the scholar's religious presuppositions (whether recognized and articulated or not), there is no better forum than that of the "I.Q. controversy" to demonstrate the ideological components resident in what usually masquerades as objective, value-free science. In this task, I am aided (although not limited) by some foundational criticism and research done by an emerging bloc of neo-Marxist psychologists who, regardless of their final differences in world-view from orthodox Christians, often present a model of articulately partisan scholarship that Christians might do well to emulate in some respects. Finally, the I.Q. controversy is also an excellent crucible for examining the very loaded question as to whether psychology, as a science of persons, is adequately addressing (or even can address) the full range of human psychological functioning through a research paradigm borrowed from the natural sciences.[4]

The Origins of Intelligence Testing

The date routinely given for the origin of psychology as a separate discipline is 1879, when Wilhelm Wundt, a physiologist by training, opened his "physiological psychology" laboratory in Leipzig and began his experimental studies of the elements and attributes of conscious experience. Before this time, the psychologically-oriented writings of persons such as Plato, Aristotle, Aquinas, Hobbes, Descartes and Locke differed in two fundamental ways from psychology as it later developed. These earlier writers were all commited to developing a general system of psychology, able to embrace such diverse phenomena as thought, emotion, memory, behavior, aesthetics, morality, and government. In addition, their methodology was philosophical (and often even theological), rather than empirical in the natural-scientific sense. Psychology's abrupt departure from its philosophical parent in 1879 was but one manifestation of a more general divorce between science and philosophy that had gained momentum towards the middle of the 19th century as more and more philosophers acknowledged the importance of experimentation as an epistemological tool. One enduring result of this trend was that the new psychology became less and less system-orientated, focussing instead on developing methods for investigating more isolated psychological functions that mirrored the experimental, operational, and quantitative approach of the natural sciences. In addition, by the mid-19th century, the spirit of the Enlightenment had so come of age that the vast majority of serious writings in science were completely devoid of any confessionally-Christian references, being couched instead in a metaphysics of naturalism and progress which

> took for granted...that each more advanced form of life carried its primitive past with it; that in the dark struggles of the living world, beauty and order arise out of chaos; that man is not removed from these natural laws and forces; that every production of nature is but a stage in the endless march of progress.[5]

At the height of this formative *Zeitgeist*, an English gentleman-scholar named Francis Galton set up what he called an "anthropometric laboratory" at the London International Health Exhibition of 1884, a mere five years after the founding of Wundt's laboratory in Leipzig. Born in 1822 to the family of a prosperous Birmingham banker, Galton was a man of many parts. Trained in mathematics and medicine (although with an undistinguished record in both), the young Galton bid fair to become the classic rich, Victorian dilletante, puttering about with gadgets and minor inventions, until at the age of twenty-eight he took on the task of mapping part of the African interior for the Royal Geographic Society. His obsession for careful measurement resulted in a superbly-accurate mapping of part of tropical southern Africa, and resulted in his receipt of the Society's gold medal in 1853.[6] While his interest in geography lasted throughout his life (he later established principles of weather mapping and reporting which are used to this day), his primary attention was irreversibly diverted from that field by the publication of Darwin's

Origin of Species in 1859. Darwin's controversial theory of evolution by *natural* selection suggested to Galton that if inherited human traits could be identified and measured, these would then be a basis for the systematic, *selective* breeding of superior traits. (Not surprisingly, Galton became the father of the Eugenics movement, and promoted the concept of systematic human breeding right up until his death in 1911.[7]) Thus he turned his attention to the problem of measuring individual differences—particularly those differences that might reflect a capacity for "eminence" or genius, which according to his own research, seemed to run in families to a greater degree than would be predicted by chance. His "anthropometric experiments" at the London health exhibition (which involved almost 10,000 curious spectators as subjects) could be termed the very first attempts to establish a standardized intelligence test.[8]

What kinds of tasks were included in Galton's 1884 research? Very strange ones, by today's notions of intelligence. They included measures of height, weight, armspan, visual acuity, reaction-time, color discrimination, breathing power and force of hand-grip—none of them even remotely akin to items we are accustomed to seeing on I.Q. tests today, which usually include logical, spatial, verbal and problem-solving tasks, but never those stressing merely sensory-motor capacities. Yet the logic behind Galton's tests was in keeping with the rather reductionistic new psychology of the late 19th century, which assumed that the basic components of all consciousness (including intelligence) were *ideas*, which in turn were made up of elementary physical *sensations*. Thus, Galton reasoned, the most intelligent people should be those with the quickest and most accurate senses.

His reasoning turned out to be faulty, as later research showed that the kind of intelligence Galton was interested in was not, in fact, very highly correlated with sensory acuity. Yet, for our purposes, two features of Galton's work remain very significant. First of all we must note that it was highly conditioned by his own status as a Victorian gentleman. Galton's anthropometric work was very frankly motivated by his passion for eugenics; he was interested in measuring "natural ability" to the end that the most promising persons so detected might eventually (he fantasized) be offered special rewards by the state for marrying each other. (Indeed, he even envisaged Queen Victoria herself giving away the brides *en masse* at state weddings!) While this might at first glance seem to be a move in the direction of a more egalitarian society (inasmuch as a valid intelligence test would be no respecter of class origins), it is worth noting that Galton chose to believe, on the basis of his research into "eminent families," that intelligence was passed on primarily, if not exclusively, through genetic mechanisms. This he did in spite of his awareness, as a scientist, that "nature and nurture" (a phrase Galton can be credited with coining) were totally confounded in his eminent families, thus making his data uninterpretable. In other words, because these distinguised Victorian families passed on their (definitely) privileged *environments* to their children along with their (possibly) privileged *genes*, there is no way of knowing whether it is the genes *or* the environments *or* some hard-to-assess combination of both that accounts for the trend towards erudition in these families.[9] There is little doubt that, in choosing to over-emphasize the role of heredity in the determination of individual differences, Galton was (as one historian puts it)

> prevented by the many biases of his class from appreciating the helps and hindrances of the social environment. Like many other upper class Victorians, he often demonstrated a smugness and insensitivity to the position of people less fortunate than himself...(His hereditarian) assumptions ignored the great advantages enjoyed by the members of the upper classes—Galton himself included—in the socially-stratified society of Victorian England.[10]

Secondly, we must note Galton's shaping by his status as a 19th century British scientist who was heir to the forces of both the Enlightenment and the Industrial Revolution. From the former, he inherited both a hostility towards organized religion and a naive confidence in the ability of human beings—or at least a certain élite among them—to better themselves and their race through the rational application of scientific knowledge. He was a spirited combattant in the late 19th century battles between the church and the supporters of evolution, writing that, for him, the effect of Darwin's *Origin of Species* was "to demolish a multitude of dogmatic barriers by a single stroke, and to arouse a spirit of rebellion against all ancient authorities whose positive and unauthenticated statements were contradicted by modern science."[11] Even so, the irreducibility of the religious impulse in human beings is suggested by the fact

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that Galton dreamed not of *eliminating* religion, but of establishing an *alternative* cult, based on evolutionary and eugenic principles and presided over by a species of Pantheistic "oversoul" consisting of the entire organic universe expressing itself in the evolution of ever-higher forms of life. To Galton, human intelligence (at least in people of his own class) had evolved enough to allow at least a dim understanding of the deity's evolutionistic activities. Consequently, that activity could be accelerated by the thoughtful application of eugenic science, towards which the religious interests of the populace should now properly be directed.[12] "Eugenics," comments one of his recent biographers, "had become a religion for Galton, and he devoted the rest of his life to its pursuit with all the devotion, energy, and conviction of a religious zealot."[13] Typical also of his Enlightenment legacy was Galton's naive assumption that neither the state nor science would ever abuse such a selective-breeding policy—an assumption completely shattered by its brutal and calculated misuse in Nazi Germany less than half a century after Galton's death.

Finally, the gathering strength of the spirit of the Industrial Revolution, with its push towards mechanization, efficiency, and mass production can be seen in Galton's attempts to develop a series of quickly-administered, numerically-scalable items which he hoped would distinguish the less from the more innately-intelligent, with the aim of systematically promoting the traits of the latter in the population at large. Although we take such mass testing devices for granted today (in activities as diverse as medical diagnosis, armed-forces classification, and graduate student selection), Galton must be credited with the very *idea* that quantitative tests could be developed to measure qualitative psychological differences among people. Indeed, the novelty of his procedure is illustrated by the fact that so many thousands of people queued up for him at the 1884 exhibition, and even paid a fee of three pence each to receive a list of their various "intellectual strengths"![14] What we will see later is that this novelty of the 19th century has too often become a tool for the overly-hasty, overly simplified mass sorting of people into crude categories as an aid to the efficient implementation of social, economic, or educational policy.

Binet's First General Intelligence Test

Galton, as we have noted, began his anthropometric studies in England in 1884, and published his findings in his 1889 work entitled *Natural Inheritance*. By 1910, a mere two decades later, American psychologist G.M. Whipple (one of America's first Ph.D.'s, and a product of Cornell University) was able to publish a *Manual of Mental and Physical Tests* which listed no fewer than fifty-four tests, along with precise instructions for their administration.[15] What had happened in this short space of time to catapult Galton's scientific novelty into an institution of national importance across the Atlantic in America? Several factors seem to have been at work.

To begin with, American psychology was, from its beginnings, strongly functionalist in spirit: the practical demands of a recent frontier existence had left in most American scholars a strong bent towards finding cause-effect relationships with practical implications. In addition, the effect of Darwin's *Origin of Species* in America was to promote a more "democratic evolutionism" than was the case in Victorian England. Whereas Galton had fixed his attention on the evolutionary *continuity* of genetic strains, American Darwinists (in particular John Dewey) focussed on the effect of environmental pressure in *changing* both genetic and behavioral patterns, and on the very non-élitist way in which random genetic mutations took place. In addition, Dewey was an influential promoter of the idea of *social* evolution: while favorable genetic mutations might indeed occur randomly, he held that even this "aristocracy of chance" might be overcome by appropriate social engineering and education for persons of all classes. The result of such thinking was the promotion of mass education and, soon afterward, the birth of educational psychology with its concern for what children know, how they learn, and how their learning can be facilitated. In short, the testing movement in North America paralleled the development of educational psychology and provided the latter with its most prominent tool. It should be noted, however, that while Galton developed his tests to buttress a class-based *status quo,* whereas the North American motivation behind test development was initially more egalitarian, a common secularist spirit lay behind both movements: for Dewey, as for Galton, the biblical concepts of creation, fall, and redemption were outmoded superstitions, and the malleability of individuals and institutions through the implication of human intelligence and scientific methodology was held to be almost limitless.[16]

Given the pragmatic spirit of much American psychology, and its close association with education in the latter 19th and early 20th centuries, it did not take the testing pioneers long to conclude that mere physiological and sensory indices of "intelligence" were inadequate. Their concern was with the educability of children, and with the possibility of predicting which ones would proceed smoothly through the school system and which would have difficulties that might require intervention. Consequently, when it turned out after numerous studies that sensory-motor indices correlated very poorly with academic progress,[17] alternative routes to the assessment of "native abilities" were sought. The most promising alternative seemed to be in the work of Alfred Binet, France's pioneer psychologist, who had already, by the turn of the century, published works on *The Psychology of Reasoning* and *The Experimental Study of Intelligence.* Binet had been asked by the French government to develop a test that would detect those children who were too slow intellectually to profit from regular schooling, and he had assumed from the start that the tasks on such a test should not be sensory-motor ones. He also assumed that intelligence had a *developmental* course—that is, that it became more sophisticated and differentiated as children aged. He further assumed that "dull" children were merely "retarded" in their intellectual development: Binet reasoned that they would perform on the tests like *normal* children of *younger* ages (something which we now know to be a too-simplistic theory of a multi-faceted phenomenon such as retardation).

Finally, Binet assumed that intelligence was a *general* capacity for comprehension and reasoning that would show up in various ways. In other words, he assumed that a "bright" child's high intelligence or a "dull" child's low intelligence would manifest itself fairly uniformly on all intellectual tasks. In other words, intelligence was regarded rather like ink poured into a glass of water: a lot of it will color the water quite deeply, whereas a little will result in a much lighter hue—but in either case, the entire supply of water becomes a uniform color once the ink has diffused throughout.[18]

An I.Q. score per se simply rank-orders a person's performance on a set of tasks relative to his or her peers; there is nothing in the score itself that can detect whether the origins of individual or group differences are the result of nature, nurture, or both.

The reader may have observed that none of the above assumptions ever addresses the theoretical question as to what intelligence *really consists of*. According to some sources, Binet had wrestled in vain with the "essence of intelligence" in his earlier writing, and was relieved to turn his attention to the more practical task of distinguishing "normal" from "backward" children in the Paris school system. To do this, he did not need to have a developed theory of intelligence; he needed only to find out what, in fact, the majority of children *could* do at a variety of age levels and then devise a test that would sample it efficiently and adequately. More specifically, he decided to consider "normal" those aptitudes that appeared common to about 75% of the children of any given age. Having fixed the percentage to be considered "normal" (noting that it arbitrarily assumed that at least 25% of children should be classified as "backward"), Binet then set out to devise, by guess and intuition, a number of "stunts" (as he called them) that he could try out on a sample of Paris schoolchildren ranging in age from three to fifteen years.[19] Whenever he found a stunt that about 75% of a given age group could pass, he retained it as an item that could detect normal ability for that age. Items that did *not* meet this criterion were discarded. Hence, by Binet's criterion, to have a "mental age of seven years" was to be able (regardless of *actual* age) to pass all of the same items as 75% of a (hopefully) representative group of seven-year-old Paris school children at the turn of the century. To have a mental age *exceeding* one's chronological age meant that the child passed all items up to and including those for his own age, plus some beyond. Conversely, to have a mental age *below* one's chronological age was to pass fewer items than one's peers.[20] All of the most commonly-used I.Q. tests are direct descendents of Binet's, both in conceptualization and standardization. The so-called "Intelligence Quotient", or I.Q., is obtained simply by dividing "mental age" (as assessed by the test) by "chronological age" and multiplying by 100.

Binet issued this first intelligence scale (in collaboration with a colleague, Thomas Simon) in 1905, and revised it twice before his death in 1911. The revisions were conditioned by the following considerations: (1) Did each item reliably reflect the changes in proportions of children answering it correctly at different ages? (This reflected Binet's developmental assumptions about intelligence.) (2) Did performance on each item correlate well with performance on the test as a whole? (This reflected Binet's assumption that intelligence must be a *general* capacity, reflected in all samples of performance.) (3) Finally, did the test scores as a whole do the job that the Paris school system wanted them to? In other words, did they correctly identify chronically "slow learners"? To determine this, Binet asked Paris teachers to identify, by their own scholastic and pedagogical criteria, the pupils *they* considered to be slow, independent of any knowledge of the test scores. To the extent that their diagnoses corresponded with Binet's test-based ones (and subsequent revisions of the test progressively tightened these correlations), the test was doing its job—or, in psychometric jargon, it was "valid."

It is also important to note some questions that Binet's work did *not* answer and never claimed to be able to. First of all, as we have seen, Binet never stated what the essence of intelligence is. His test items were merely a set of age-graded, trial-and-error derived tasks, performance on which correlated well with rate of school progress in Paris. His assumptions about its "general" and its "developmental" character were the closest he came to actually defining intelligence. Secondly, Binet's validation process did not question the content of the Paris school curriculum of his time, nor its pedagogical methods, nor the teachers' criteria for diagnosing "bright" and "backward" children. Inasmuch as all subsequent tests tend to be validated by their correlation with (at least parts of) Binet's original, they implicitly reflect a definition of intelligence that is linked to a particular school structure in a particular part of the world at a particular point in history.[21] Thirdly, Binet never pretended that his tests were measures of innate, immutable capacity—or, for that matter, of acquired, changeable capacity either. The tests could only predict school-correlated performance with a reasonable degree of probability; they could not say what the *source* of that performance, whether backward, average, or precocious, was. It is of interest, however, in light of the subsequent use made of Binet's work in America, that Binet *personally* leaned towards a mostly environmental view of the origins of test performance. Indeed, he protested against the "brutal pessimism" of persons who suggested that the test score was a fixed quantity, and suggested remedial "mental orthopedics" as a means of raising the capacities of children with low scores.[22] Finally, there is no evidence that Binet thought that his test could be put to universal use with equal validity. He had devised a practical sorting tool for use in the Paris school system of the 1900's, and nothing more. Indeed, he died (in his early fifties) before he could carry his ideas any further.

American Contradictions: Democracy vs. Elitism

Binet's death in 1911 corresponded with the American upsurge in educational psychology referred to in the previous section. It was only natural that the task of further revising and adapting the Binet Intelligence Scale was taken up by psychologists across the Atlantic. The name of Lewis M. Terman, a Stanford University psychologist, is so strongly associated with this work that subsequent revisions of the Binet still bear the title "Stanford-Binet Intelligence Scale." Terman found that the Paris-evolved Binet scale worked badly on California schoolchildren, inasmuch as performance on certain of Binet's "stunts" did not show the same age-related changes, or the same item-total correlations demanded by Binet's assumptions about intelligence. One would think that such findings would point to the obvious conclusion that intelligence (whatever it is) is at least somewhat culturally relative: the cognitive skills and knowledge acquired by the average Parisian child are somewhat different from those of children raised in northern California, even though both settings are part of the western, industrialized world. Moreover, educational curriculum and techniques also vary between the two settings, thus requiring somewhat different standards for validating the usefulness of the test as a predictor of "normal" school progress. Yet it seems that Terman went about his revisions of the Binet (using Binet's original methods of item selection and validation, except that the standardizing group was now 2,300 Californians "in a community of average social status."[23]) without ever publically acknowledging a crucial assumption—namely, that he *must* have believed that intelligence was to a degree culturally-acquired (and therefore not purely the product of genetic inheritance), or else he would not have revised the Binet in the first place. Instead, he would simply have concluded that his Californian subjects were "stupider" (or at least innately different) than Binet's Parisians, published his conclusions, and left it at that. What he in fact did was to retain only those of Binet's items which "worked" for his California sample, add others which were shown to have the developmental functions, item-total correlations, and school-progress predictability that he desired, and *still* maintain that what was being measured was essentially genetically-inherited intelligence.

How is it that Terman (and most of his associates in the early testing movement) were able to get away with such an exercise in double-think? The answer seems in part to be found in their involvement in a strong and influential turn-of-the-century eugenics movement in America.[25] This movement was a direct historical descendent from Galton's eugenics concerns in 19th century England, particularly via Charles Benedict Davenport, who had studied Galton very seriously and persuaded the newly-formed Carnegie Institution of Washington to sponsor a biological research station that he would direct. By 1910, Davenport had founded the "Eugenics Record Office," which eventually included committees on the inheritance of mental traits, the inheritance of deaf-mutism, the heretability of feeble-mindedness, and also a "committee on sterilization." These committees (including several well-known pioneers in American psychology)[26] were influential in pressing for the "eugenical sterilization laws" that were in effect between 1907 and 1928 in a final total of twenty-one states. Moreover, these laws, and the persons behind them, regularly lumped together mental and moral traits and implied that science had shown them to be interconnected. Thus, the Eugenics Record Office included in its definition of "feeble-minded" the insane, the criminalistic, the epileptic, the habitual drunkard, the diseased, the blind, the deaf, the deformed and the dependent—including orphans, "ne'er-do-wells", tramps and paupers.[27] Terman, in his 1916 volume on *The Measurement of Intelligence,* could inform his readers, with all the apparent backing of the new "science" of psychology, that

> all feeble-minded are at least potential criminals. That every feeble-minded woman is a potential prostitute would hardly be disputed by anyone. Moral judgment, like business judgment, social judgment, or any other kind of higher thought process, is a function of intelligence.[28]

The eugenics movement did not stop with a concern for keeping the American gene-pool free of physical, mental, and moral defects; it went on to claim that such defects were overwhelmingly more present in persons of non-Anglo-Saxon descent, including not only the Blacks, Indians, and Mexican Americans already present in the United States, but also the more recent immigrants from the Slavic and Mediterranean countries, Jews of whatever national origin, and even the French Canadian migrant workers (presumably of much the same stock as Binet's schoolchildren) who innundated New England early in this century. The "scientific" basis for these conclusions was said to lie in the outcome of mass I.Q. testing (using various adaptations of Terman's Stanford-Binet, including a version for illiterates) done on thousands of army recruits during World War I and on thousands of immigrants passing through Ellis Island in the years before and after. According to the 1913 report of psychologist Henry Goddard (who did the Ellis Island testing at the request of the United States Public Health Service), 83% of Jews, 80% of Hungarians, 79% of Italians and 87% of Russians were "feeble-minded."[29]

The result, by 1924, was a congressional law not only restricting the *total* number of immigrants per year to the U.S.A., but also assigning "national origin" quotas, which restricted the proportion of entrants from a given country to the percentage of their numbers present in the U.S. in 1890. Why an 1890 criterion? The drafters of the law were quite frank about their motivation: prior to 1890, the majority of U.S. immigrants were of Scandinavian, British, and German stock. Only after 1890 did the Mediterranean-Slavic influx begin. Thus the new law deliberately tipped the scales in favour of continued Anglo-Saxon dominance. And although the sterilization laws were never applied to those non-Anglo-Saxon immigrants who *did* manage to get it, it was not because the psychologists in the eugenics movement didn't advocate it. Carl Brigham, a Princeton professor involved in the immigrant research, was aware that, as long as present immigrants of "undesirable origin" continued to propagate, "the revision of the immigration and naturalization laws will afford only a slight relief...The

really important steps are those looking towards the prevention of the continued propagation of defective strains in the current population."[30] And Terman, writing in 1916 about the poor test performance of Indian and Mexican children, stated that

> children of this group should be segregated in special classes...They cannot master abstractions, but they can often be made efficient workers...There is no possibility at present of convincing society that they should not be allowed to reproduce; (nevertheless) they constitute a grave problem because of their unusually prolific breeding.[31]

In all of this, there are two puzzling but enduring contradictions, one on the disciplinary, the other on the national level. As regards the first, we have already pointed out that Terman, by virtue of even deciding to revise the Binet for use in America, was already conceding that the expression of intelligence depended rather heavily on exposure to a certain culturally-based set of experiences. In addition, while the sample of 2,300 Californians on which he standardized the Stanford-Binet included males and females, rural and urban dwellers, and individuals of all socioeconomic classes proportionate to their numbers in the general population, it was composed only of white, native-born Americans. Consequently, a non-native or non-white child's test score represents only how well that person has performed relative to a norm which never took his or her cultural group into account in the first place! Finally, as Binet knew and Terman must also have known, an I.Q. score *per se* simply rank-orders a person's performance on a set of tasks relative to his or her peers; there is nothing in the score itself which can detect whether the *origins* of individual *or* group differences in performance are the result of nature, nurture, or both, since (as we have already seen) these factors are hopelessly confounded in all cultural and racial groups. To conclude that the inferior performance of dark-skinned persons is *caused* by the genetic makeup which includes their dark skins goes beyond the information available and is simply an unjustified inference of causality from correlation. This is not to say that there is necessarily *no* such causal relationship (an equal and opposite error made by well-meaning liberals); *it simply means that we do not know.*[32] Yet, in spite of all these qualifiers, Terman and his associates in the testing movement continued to write as if (and convince legislators that) the tests measured innate, immutable intelligence in all groups to which they were applied.[33]

They were able to do this, I suspect, because of a second profound contradiction which lies at the very heart of American democratic ideology. We have already referred to John Dewey's brand of "democratic evolutionism" and the effect that it had on the promotion of mass schooling after the mid-19th century. Is it not puzzling that in the midst of this national vision of America as the great melting pot, with equal opportunity for all, there should arise a pseudo-scientific eugenics cult of such vast influence? Puzzling, yes; un-American, no. As one historian of the testing movement has written,

> The nativism, racism, élitism and social class bias which were so much a part of the testing and eugenics movement in America were, in a broader sense, part of that *Zeitgeist* which was America. This is the land of the Ku Klux Klan, the Red Scare and the Scopes trial as well as the land of real opportunity for millions of immigrants. It was this kind of contradictory base in which the corporate liberal state took firm root, building a kind of meritocracy that even Plato could not have envisioned.[34]

Psychology is profoundly affected by ideology—which would not be so bad, provided that it were frankly acknowledged more often.

In a more summary fashion, contempory sociologist Herbert Gans concludes, on the basis of his own research that "America is an inherently unequal nation which like to think of itself as egalitarian."[35]

In part, the tension between democracy and élitism was resolved by Terman and his associates in the following way: on the one hand, (true to the American melting-pot ideology) they rejected, as Galton in England had not, the notion that mental and moral superiority ran in the blue blood of certain *families*. On the other hand (true to their meritocratic assumptions) they believed and preached that, through a natural sorting process, "the cream would rise to the top." Because Terman's research had shown that high test scores were overwhelmingly more common in the professional and managerial classes than in the working class, and because he believed the tests were a pure measure of innate intelligence, it was only a short step to the belief that it was high I.Q.-s that had *caused* their possessors to become members of the socioeconomic elite. That this professional and managerial élite was also overwhelmingly white was not seen as part of a racist plot on the part of the testing pioneers; it was not their fault (or that of American society) that non-whites did not do better. The tests had shown them, on the average, to have I.Q.'s typical of the poorest-paid manual laborers. Consequently (it was argued) only their own inherent limitation kept them from ascending the American ladder of betterment that was equally available to all. This was a superb way to get the best of both worlds! For now the tests could be billed as the "servants of democracy," ferreting out "natural ability" regardless of the pedigree of its possessor (after all, one to two percent of the unskilled labourers in Terman's study turned out to have "gifted" level I.Q.'s), while at the same time their results, in the main, served to confirm the existing distribution of wealth and privilege!

But here, of course, we have another example of causality being inferred from merely correlational data. It was certainly true (and continues true to this day) that lower I.Q. scores are *correlated* with low socioeconomic status and non-white origins. But this by no means leads either to the conclusion that innate intelligence is the *explanation* of socioeconomic status, *or* that racial origin is the explanation of group differences in I.Q. (both of which were assumed by the testing/eugenics proponents). It would be no less

(but also no more) justified to argue that membership in certain classes and/or racial groups, by depriving their members of the "average white" experiences assumed by I.Q. test items (see footnote 19 for some early examples) was what led to the *appearance* of low I.Q. scores in these groups. For, as we have seen, since parents generally bequeath their *environments* to their children along with their *genes*, there is no way of knowing whether the fact the "I.Q. scores tend to run in families" (as they certainly do) is the result of nature, nurture, or both—and if both, then in what proportion each.

It is interesting to note that, to this day, all students of psychology are repeatedly warned that "correlation does not necessarily imply causality," and that, to this day, psychologists routinely infer causality from correlation when such inferences accord with their particular value-system. In addition, they are able to get away with such inferences to the extent that the peer-review system in which they move (and which evaluates them for promotion, publication, and research funds) operates according to the *same* value system. In other words, psychology is profoundly affected by ideology—which would not be so bad, provided that it were frankly acknowledged more often. In fact, for the most part, such admissions are as rare now as they were at the genesis of the I.Q. testing movement, and ideology instead hides behind a screen of implied scientific objectivity and statistical numbers-magic, resulting in profound social consequences such as those we have illustrated.

But the recognition of this reality should, in turn, make it easier for Christians in psychology to do their work from the basis of an honestly-articulated world-view, and some unfolding of the implications of this for the I.Q. controversy will be attempted in later papers. But prior to this, we need to bring the I.Q. controversy up to date, and to examine in more detail the various answers that are currently circulating with regard to the questions posed in the introduction of this essay. This is the subject of the next paper.

REFERENCES

[1]All information on *Mensa* in these articles is taken from publications and reprints supplied in 1981 by *Mensa* (Canada), P.O. Box 505, Station S, Toronto, Ontario M5M 4L8.

[2]For a very complete and readable introduction to the history of prominent themes in psychology, see Robinson, Daniel N. *An Intellectual History of Psychology* (New York: MacMillan Publishing Co., Inc. 1981).

[3]Notice that the question posed by the magazine-subscription solicitors at the start of this article completely begged this question regarding the origins of intelligence!

[4]For a more detailed coverage of this question from the perspective of a Christian philosopher of science, the reader is referred to C. Stephen Evans' *Preserving the Person: A Look at the Human Sciences,* and to the author's forthcoming volume *The Sorcerer's Apprentice: North American Psychology in Transition.* (Intervarsity Press, 1982).

[5]Robinson, *Op. cit.,* p. 362.

[6]A good summary of Galton's life and contributions to psychology can be found in Fancher, Raymond E.: *Pioneers of Psychology* (New York: W.W. Norton & Co., 1979), from which most of the material in this section is drawn.

[7]He also tried to practice what he preached, marrying in accordance with his eugenic principles a wife from a very accomplished family. Ironically, however, they were never able to conceive children—one caprice of nature that his science could not have anticipated. (Fancher, *Op. cit.,* p. 293).

[8]Fancher (*Op. cit.,* pp. 257-258) suggests that Galton's life-long passion for measuring aptitudes and promoting the idea that they were largely hereditary stemmed from his own undergraduate days as a mathematics student in a highly competitive programme at Cambridge: "During his Cambridge career, Galton was constantly preoccupied with his standing relative to his fellow students. His letters home betrayed an obsessive concern with examinations, including the way they were constructed and marked at Cambridge so as to yield a precise ranking of all students. Undoubtedly, his disappointment at not being able to place at the very top of the list was an important factor in (a later) nervous breakdown. Recovery came only slowly, after Galton abandoned any thought of competing for honours, and settled for an ordinary or "poll" degree. His preoccupations with examinations and the ranking of intellectual ability would persist in milder form throughout his life, however, and would contribute to his later development of mental tests."

[9]To give him due credit, Galton also pioneered what is now known at the "twin-study" method: the comparison of mono- and dizygotic twins as a way of deconfounding the influence of heredity and environment of physical and psychological traits. As we shall see later, however, this methodology raises as many questions as it answers when it applies to the question of the heretability of intelligence.

[10]Fancher, *Op. cit.,* pp. 293-294; pp. 253 & 272.

[11]Galton, Francis: *Memories of My Life* (London: Methuen, 1908), p. 245.

[12]Galton's criticisms of the 19th century English church, and his version of an alternative "religion" of eugenics are most clearly outlined in his *Hereditary Genius* (Gloucester, Mass.: Peter Smith Publishers, 1972).

[13]Fancher, *Op. cit.,* p. 171.

[14]Galton also pioneered the use of the questionnaire schedule in his study of 2000 distinguished Royal Society Fellows for his 1874 *English Men of Science.* Despite the alarming length of the questionnaire, almost all of those solicited responded in detail—an enviable result in comparison with today, when a 30% return rate is considered good for any questionnaire, and also an indication of the great novelty of the method.

[15]The chronological history of mental testing in the U.S.A. from 1880 through 1950 is well documented in Boring, E.G., *A History of Experimental Psychology* (New York: Appleton-Century-Crofts Inc., 1957), Chapter 22.

[16]*Ibid.,* Chapter 22.

[17]The definitive blow to the sensory-motor theory of intelligence in America was dealt by Wissler, C. in his "Correlations of mental and physical tests", *Psychol. Mongr., 16,* 1901.

[18]Although all of these assumptions tend to persist among the defenders of I.Q. tests, all have been challenged repeatedly. For a representative survey, see Block, N.J. and Dworkin, C. (Eds.) *The I.Q. Controversy* (New York: Random House, 1976).

[19]Binet's original test included items such as the following: "Are you a boy or a girl?"; "What are the names of these four colours?;" "Hand me five blocks from that pile."; "What is the opposite of the word 'large'?" "Define the word 'pride'."; "Which of these objects is different from the rest?" (e.g., showing the child an array consisting of an apple, a pear, and a cup). (Source: Lindzey, G., Hall, C.S., and Thompson, R.F., *Psychology* (3rd Edition). (New York: Worth Publishers Inc., 1976), Chapter 15.

[20]The actual calculation of mental age is usually not quite so neat: A given child may miss some items standardized below his age, while still passing some which are above. In practice, a child's "basal mental age" is the level at which he answers *all* questions for that age. To this is added two months of "mental age credit" for every question above the basal age also answered correctly, regardless of the level from which the questions come. The arbitrariness of the methodology is self-evident.

[21]Bereiter, C. "Genetics and educability: educational implications of the Jensen debate." (In: Block and Dworkin, *Op. cit.*)

[22]As quoted in Kamin, L.J.: "Heredity, Intelligence, Politics, and Psychology" (In: Block and Dworkin, *Op. cit.*)

[23]As quoted by Lippman, W.: "The mental age of Americans." (In: Block and Dworkin, *Op. cit.*)

[24]In addition, Terman pioneered the development of *adult* intelligence scales. As a result, all modern I.Q.'s are test scores adjusted for the age of the person taking the test, such that if one passes the "average"

number of items for one's age group, one is always assigned an I.Q. of 100. All I.Q. tests are also interpreted according to the assumptions that for each age the I.Q. scores are normally distributed in the population, average 100, and a standard deviation of 16.

[23]A good survey of this movement, and its effect on the development and interpretation of I.Q. tests can be found in the work of neo-Marxist educator Clarence Karier, especially in his "Testing for Order and Control in the Corporate Liberal State." *Educational Theory,* 1972, *22*(2), 154-180.

[26]The names of Robert M. Yerkes, Edward L. Thorndike, and H.H. Goddard will be familiar to students of the history of American psychology.

[27]Haller, M.J. *Eugenics.* (New Brunswick, N.J.: Rutgers University Press, 1963), p. 133. This assumption that morality and "intelligence" are intertwined persists to this day: when I recently applied for a renewal of my Canadian passport, I noted once again that only certain classes of people (who presumably can be trusted never to lie) were allowed to endorse my passport photograph. These included doctors, lawyers, professional engineers, university and community college professors, and certain elected or appointed officers at various levels of government!

[28]Terman, L.M. *The Measurement of Intelligence.* (Boston: Houghton-Mifflin Co., 1916), p. 11.

[29]Quoted in Kamin, L. *Op. cit.*

[30]Brigham, C. *A Study of American Intelligence* (Princeton,N.J.: Princeton University Press, 1923).

[31]Terman, L. *Op. cit.,* p. 77.

[32]We continue not to know, in spite of the much-publicized "separated twins" methodology pioneered by Galton and invoked more recently by Arthur Jensen. We will take up this point in a later part of this essay.

[33]The strength of Terman's commitment to this position is suggested by the fact that, out of a total of 8,500 "eugenic sterilizations" done in America under the sterilization laws between 1907 and 1928, fully 6,200 were performed in California alone, under the influence of the Human Betterment Foundation, of which Terman was a leading member. (Source: Karier, *Op. cit.,* p. 161)

[34]Karier, *Op. cit.,* p. 165.

[35]As quoted in *The New Internationalist,* 1980, *93,* p. 22.

Lying in the Laboratory: Deception in Human Research from Psychological, Philosophical, and Theological Perspectives

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Deception, as a research tool, is "objectively" considered from three perspectives. The major arguments found in psychology are summarized and the possibility of substituting role playing for deception is discussed. The paper also reviews the major philosophical positions and what they imply for the use of deception. A scriptural approach to lying suggests that, although generally unacceptable, lying may be justified in the specific case of trying to gain understanding. Finally, approaching deception "subjectively" the authors conclude that under certain limiting conditions deception may be an acceptable methodology for Christian researchers.

Browsing through the evening newspaper you find an ad soliciting subjects for a psychology experiment. The prospect of participating seems intriguing and the pay is good so you call for an appointment. As a result, several days later you report to a scientist (at least he's wearing a lab coat and glasses) at a laboratory on the campus of a prestigious local university. Since the other subject, a friendly man in his mid-fifties, has already arrived, the experiment begins. The scientist explains he will be studying the effects of punishment upon learning. Your task will be to help the other sub-

Most psychologists concede that the use of deception is ethically problematic, but for methodological reasons some argue that deception is a necessary research tool.

ject learn lists of paired associate words by administering electric shock whenever he makes a mistake. All of you then go to an adjacent room where the other subject is strapped into a chair with electrodes attached to his arm. You then return to the original room with the scientist, and sit in from of an impressive-looking shock generator. The face of the machine has a series of switches with the last one marked "Danger: Severe Shock." In the learning task that follows, you find yourself administering increasingly higher levels of shock to the other subject. Very soon the subject begins to complain, then begins to groan in agony, and eventually refuses to even attempt the task. Of course, you feel uncomfortable and unsure. You press the switches as lightly as possible and even repeatedly ask the scientist to discontinue the experiment. But the scientist, accepting personal responsibility, orders you to continue. Finally, after what seems hours, you press the last switches marked "Danger: Severe Shock," and the experiment is over.

You've just been deceived. The other subject, an accomplice of the experimenter, never received any shock. And the experimenter was not studying the effectiveness of punishment but rather your willingness to obey hurtful commands. You participated in what's become known as the Milgram obedience paradigm.

Not too surprisingly, Stanley Milgram's methods and results (in the original study Milgram [1963] found unexpectedly high levels of obedience) have aroused considerable controversy.[2] It would be erroneous to assume, however, that the use of deception in psychological research has been limited to a few, highly publicized experiments. In the applied areas we find placebos, misattribution therapy, and control groups which provide a baseline comparison for the effectiveness of therapeutic techniques. In the basic branch of the family tree some areas of research rely almost exclusively upon deception (e.g., conformity and attitude change). This isn't to say that all or even most psychologists use deception. But it is a technique provisionally allowed by the American Psychological Association's guidelines for research with humans (APA, 1973), it does appear in the method sections of many psychological journals (Menges, 1973), and it has been recommended as a therapeutic technique (Goldstein, Heller, and Sechrest, 1966).

The purpose of this paper is to analyze critically the general practice of intentional lying within the domain of laboratory research (with a particular emphasis upon psychology). We first attempt to identify and discuss the relevant issues from the perspective of three disciplines: philosophy, theology, and, of course, psychology. Fortunately, each of us makes a living in one of these three fields. We then attempt to integrate our perspectives and outline what we consider to be an acceptable Christian position on this topic.

A Psychological Perspective

Psychologists have developed reasonable arguments for and against the use of deception. This section of the paper presents some of the major arguments and briefly summarizes the relevant empirical literature. Finally, the potential for role playing as a substitute for deception is discussed.

Most psychologists concede that the use of deception is ethically problematic, but for methodological reasons some argue that deception is a necessary research tool. Four reasons for using deception are commonly cited.

Arguments for Deception

1. Deception allows the experimenter to increase the impact of a laboratory setting (Aronson and Carlsmith, 1965; Cooper, 1976). Presumably as the experimental situation becomes more realistic and involving, the independent variables are more likely to have the impact (but not necessarily the results) intended by the experimenter. Campbell (1957) calls this internal validity, a necessary condition for generalizing from the laboratory to the outside world.

As an extreme example of increasing internal validity consider a study by Berkun, et al. (1962) which assessed the effects of panic upon performance. In this study military personnel were led to believe they were in immediate danger of losing their life because of misdirected incoming artillery shells. The only means of escape was to repair a faulty radio transmitter and contact someone outside the area. Of course, the personnel were never really in danger. But it seems safe to conclude that the study did provide an accurate view of performance under emergency conditions.

2. Some significant areas of human life simply cannot be explored ethically using the experimental method. By using deception, however, the experimenter can sometimes sidestep this ethical dilemma by creating a facsimile of the area of interest.

Darley and Latané's (1970) work with bystander intervention provides a good example. Typically, these researchers staged emergencies (someone experiencing a seizure, breaking a leg, etc.), manipulated other situational factors, and then determined the impact of these factors upon bystanders' willingness to help. This research produced valuable information about how people respond to such situations without having to create an actual emergency. Certainly, an alternative methodology would have been to use a more descriptive approach, but then, the causal relationships might not have been so clear.

3. Using deception may protect the experimenter from certain "subject problems." This argument is based on the assumption that a subject's motives can profoundly affect how he or she responds to the experimental situation. It has

been argued that some motives place subjects in roles that threaten the validity of research results. Three such problem roles have been extensively discussed.

The negativistic subject (Cook, Bean, Calder, Frey, Krovetz, and Reisman, 1970; Masling, 1966) wants to disconfirm the experimenter's hypothesis. Such an expression of hostility may result from the inconvenience of participating in the study or perhaps may be a reaction to the experimenter's temporary control over the subject. But, regardless of the reason, the subject now wants to invalidate the experimenter's study.

The good subject (Orne, 1962) is motivated in a more positive, but still misguided, direction. This subject wants to benefit science and/or the experimenter. However, the subject attempts to "help" by conscienciously confirming the experimenter's hypothesis. This kind of help can lead the experimenter to conclude falsely that the validity of his or her hypotheses has been verified.

The apprehensive subject (Rosenberg, 1965) wants to "look good" in the eyes of the experimenter. Most everyone is at times concerned about the image he or she presents to others. The presence of an expert in psychological health (the experimenter as viewed through some subjects' eyes) probably amplifies such a concern. Thus, in an experiment, a subject might not respond honestly when such a response could make him look like a psychological pygmie.

Weber and Cook (1972) review the research assessing the impact of subject roles upon experimental results. They conclude the apprehensive subject role has the strongest empirical base. However, given the right situation, it seems likely that all three roles could profoundly affect how subjects respond.

4. Psychologists favoring deception typically assume any potential negative effects resulting from deception (e.g., disruption of the subject-experimenter relationship, hurtful self-revelations, or dismay at being deceived) can be removed through debriefing. This technique essentially involves removing any false information (dehoaxing) or negative feelings (desensitizing) resulting from deception. As a rule most reseachers attempt to guarantee that subjects will finish an experiment in as good or better psychological shape than they began.

The empirical evidence supporting the effectiveness of debriefing is mixed. In a well-known study, Berscheid, Abrahams and Aronson (1967), after using deception to manipulate social skills feedback, found dehoaxing immediately ineffective for all subjects and ineffective for an even longer period of time with certain personality types. But, after weighing all the available empirical evidence, Holmes (1976a, 1976b) concluded that dehoaxing and desensitizing were actually effective.

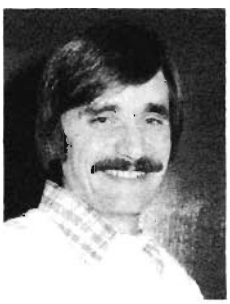
Arguments Against Deception

Those opposing the use of deception take exception to some of the ideas presented above and advance arguments of their own. The following paragraphs summarize some of the more common arguments against deception.

1. Some psychologists argue that deception promotes an unfortunate role for subjects in research (e.g., Kelman, 1967). They argue that too often subjects assume roles that are second-rate and powerless compared to the experimenter. The eventual result may be a negativistic reaction by subjects (withdrawal, hostility, etc.) which can lead to a subversion of the ultimate goal of research, understanding.

Deception may contribute to such a situation in at least two ways. First, to the extent that knowledge produces power, deception (at least initially) reduces the subject's power. And secondly, the use of deception means the subject is no longer free to choose intelligently what conditions he or she will be exposed to. Such a loss of freedom again results in a reduction of relative power. Probably the most famous example is the Milgram (1963) experiment, referred to earlier, where some subjects displayed their willingness to obey destructive commands. Such information may have given the subjects a broader understanding of themselves, but obtaining it was not part of the original agreement when they decided to participate.

The most commonly proposed remedy for this state of affairs in participatory research (Kelman, 1967). Such an approach views research as a joint effort with the subject



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and experimenter collaborating toward the goal of gaining understanding. Unlike deception, the experimenter attempts to increase the subject's sophistication. Ideally, this approach enhances the interest of the subject and, thus, produces behavior that is honest and natural. A good example of participatory research is role playing, a technique discussed in more detail later.

2. Interwoven with the above position is the notion that deception implies an unfortunate view of the nature of man. Essentially, deception implies that man must be deceived under certain conditions because he cannot be trusted. Opponents of deception argue that mankind deserves the benefit of the doubt (Jourard, 1971; Kelman, 1967). They suggest that treating people as if they are honest and trustworthy promotes the same.

3. Deception is poor public relations for psychology. Presumably, the average citizen believes that people who lie are bad. Thus, some psychologists fear that as it becomes common knowledge that psychologists use deception, psychology's public image will receive a "black eye." Such a state of affairs could produce at least two unpleasant consequences. First, a reputation for lying might make it more difficult for a psychologist to establish a trusting relationship in therapy. And secondly, a negative public image might lead to overly restrictive legislation controlling the research process.

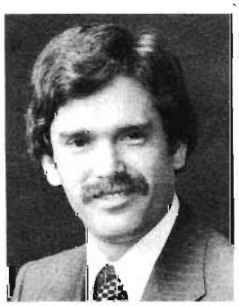
Looking at the available empirical evidence provides at least some assurance for the psychologist. First, it seems that when applying an ethical ruler to research, psychologists are more conservative than potential student subjects (Sullivan and Deiker, 1973). This graciousness on the part of students may reflect a general feeling in our society of the importance of science and a desire to allow science freedom to grow. Secondly, in the public mind, deception by itself seems to be a secondary consideration that becomes significant only when used in a particularly stressful way (Mannucci, 1977; Rugg, 1975).

4. Using deception may eventually prove to be self-defeating. Successful deception produces an unsuspecting group of subjects. But as word of the use of deception spreads the eventual result may be a generally suspicious subject population. Certainly one solution to such a problem would be to seek out new subject populations (i.e., look beyong the college sophomore), but such a solution seems short-sighted at best.

Empirically, consideration of the suspicion issue has focused on primarily three issues: 1) Do deceived subjects talk about their experiences to other potential subjects? 2) Does suspicion affect experimental results? and 3) Is it possible to assess suspicion independently?

The issue of subjects' willingness to discuss experimental procedures is significant since it is related to the general level of suspicion in a subject population. At least two studies provide mixed results. Wuebben (1967) found that most subjects talked even though they promised not to. Interestingly, he found this tendency to talk was more pronounced for later-borns than first-borns or only children. But Aronson (1966) found no evidence for inter-subject communication. Comparing the two studies it becomes apparent that Aronson took greater care than Wuebben in convincing subjects of the importance of not discussing the experiment and generally encouraged a higher level of subject involvement in the debriefing process. This suggests that if an experimenter is willing to debrief subjects extensively and carefully, they will reciprocate by complying with requests not to discuss procedures.

When looking at the impact of suspicion upon research results, again the evidence is mixed. Some studies have found that suspicion affects how subjects respond to an experimental situation (Adair, 1972; Cook, Bean, Calder, Frey, Krovetz, and Reisman, 1970; Rubin and Moore, 1971; Holmes and Appelbaum, 1970; Silverman, Shulman, and Wiesenthal, 1970; Stricker, Measick, and Jackson, 1967) while others have found little or no effect of suspicion (Allen, 1966; Brock and Becker, 1966; Fillenbaum, 1966). It is, therefore, impossible to draw general conclusions. Rather, the effect of suspicion probably depends upon such factors as previous research experience, the role adopted by a subject, the level of suspicion, the personality of the subject, and the specific situation (those eliciting special concern about self-presentation are probably most vulnerable).



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Since the above discussion suggests that under certain conditions suspicion can affect performance, the issue of detecting suspicion becomes significant. At this time the strongest statement that can be made is that often the task of assessment can be difficult and the specific methods used may profoundly affect the outcome (Golding and Lichtenstein, 1970; Levy, 1967; Rubin and Moore, 1971).

Role Playing as an Alternative

A lot of energy, time, and thought has gone into the deception controversy, And even now the conflict continues. Perhaps the ideal solution would be to introduce a new methodology as effective as deception but without the ethical baggage associated with deception. Such a proposal has been made before (Kelman, 1967). Currently, the leading candidate as a replacement for deception is role playing.

Role playing is a global term covering a large number of variations along a basic theme. Essentially this theme involves providing the subject with more information than is typical with a deception paradigm. The polar extremes of this theme are what Horowitz and Rothschild (1970) call forewarning and prebriefing. Forewarned subjects are simply told before a study begins that deception may be involved and at this point have the opportunity of freely choosing to place themselves in a situation where they may be misled. Prebriefed subjects are given a detailed explanation of all the deceptions which will be part of a study (essentially the same information as would be contained in a debriefing) and then are asked to participate in the study as if they had not been informed.

The key question, of course, is can role playing produce the same results as deception?[1] Empirically, the evidence for prebriefing has been mixed (for example, see: Gallo, Smith, and Mumford, 1973; Greenberg, 1967; Holmes and Bennett, 1974; Willis and Willis, 1970). The effectiveness of prebriefing is probably a function of various factors: the extent to which the subjects play an active or passive role, whether subjects role play themselves or the role of another, the staging of the experimental situation, the inherent acting ability of the subject, and the type of dependent variable (behavioral vs. self-report). Interestingly, so far the results for forewarning have been less ambiguous. To our knowledge every empirical test of forewarning has found no difference between the results produced by it and deception (Gallo, Smith, and Mumford, 1973; Horowitz and Rothschild, 1970; Holmes and Bennett, 1974). Thus, the validity of role playing seems to depend upon the type of role playing, the nature of the experimental situation, and the subject. Therefore, it does seem premature to conclude summarily that role playing is a methodologically acceptable substitute for deception.

Summary

This section has attempted to summarize current psychological thought concerning deception. One danger of such an approach is oversimplification leading to a "good guy vs. bad guy" mentality. Clearly, from a psychological perspective, both a pro- and anti-deception position can be defended intelligently and with integrity.

There is no single philosophical response to the question of human deception in experimentation.

A Philosophical Perspective

It is the function of the social scientist to identify needed areas of study, design relevant experiments to generate the necessary data and then analyze and utilize the results. But the social scientist *qua* scientist cannot tell us which areas of human experience, if any, ought not be studied, which methodologies, if any, ought not be used, or how the anticipated or accrued results ought or ought not to be utilized. These are ethical judgments that should be based on one's fundamental philosophical beliefs about the nature of reality, especially one's beliefs concerning personhood and knowledge and the proper relationship between them. Accordingly, it is the social scientist (or other interested observer), *qua* philosopher or theologian, who must make such decisions.

There are three popular philosophical approaches to ethical questions.

1. *Relativism.* The relativist's fundamental ethical belief is that no moral absolutes exist. What is right is what an individual (a subjectivist) or group (a cultural relativist) thinks is right. Given this perspective, the question of deception in experimentation obviously poses no major ethical problems. If an individual scientist, or group of scientists, believes such deception is justifiable in a given situation, it is.

This does not mean, though, that such deception could never generate a moral dilemma for the relativist. He or she might, for example, feel it is wrong to use deception in a specific experiment but believe it is important to gain and use the information such deception would supply. Such a dilemma, however, would be primarily psychological, not logical, since for the relativist no objective standard exists against which the moral consistency of his or her ultimate decision can be judged.

It is, of course, questionable whether anyone is (or can be) totally relativistic in practice. But many individuals are "selective" relativists, and it may be that some social scientists (rightly or wrongly) feel justified in affirming a relativistic position with respect to the issue at hand.

2. *Consequentialism (Teleological theories).* For the consequentialist there are, in principle, no intrinsically right or wrong actions. An action is (or becomes) right if it has good consequences. There are two popular consequentialist theories.

a) *Utilitarianism.* The utilitarian maintains that the right action is that which generates the greatest amount of hap-

In the cases where Scripture allows deception, it does so because of the human predicament in sin.

piness (or pleasure) for the greatest number of people. More specifically, the "act utilitarian" is concerned with the amount of happiness actually generated for those directly involved in a given activity, while the "rule utilitarian" is concerned with the potential for happiness inherent in the repeated and widespread performance of a given type of activity.

If a social scientist were an act utilitarian, accordingly, he or she would be interested in assessing the amount of happiness or unhappiness generated in each specific experiment utilizing deception. Will the deceived individuals experience a lessening of self-worth when they later assess their actions? Will they lose trust in the experimenter when they learn of the deception? Is the use of deception the best way to achieve the desired results in this case? Could the desired results significantly benefit certain individuals? Will the experimenter feel a sense of shame? If, after considering these and related questions, the social scientist felt that a greater amount of happiness for those directly involved (e.g., subjects, experimenter, beneficiaries) would be achieved by using deception in a given experiment, it would be justifiable. The key point to keep in mind is that, under act utilitarianism, the ethical propriety of each experiment involving deception would have to be judged individually.

On the other hand, if our social scientist were a rule utilitarian, he or she would be concerned, not with any specific instance of deception, but with the practice in general. Will the general practice of deception in experimentation tend to make subjects suspicious and thus induce "artificial" responses? Will the general use of deception lead to a general disregard for the rights of individuals, and thus lead to a general disregard for personhood? Are other, equally satisfactory methodologies available? If, after considering these and related questions, it was felt that the general practice would have negative consequences (i.e., generate a net increase in unhappiness or pain) for society as a whole, it would be wrong for any social scientist to use deception in experimentation, even if a given scientist felt strongly that the practice would have positive consequences in his or her own situation.

b) *Ethical egoism.* The ethical egoist believes that an individual ought to act in his or her own self-interest—i.e., equate good consequences with self-fulfillment. Egoism, it should be noted, is distinct from relativism. The relativist denies that an objective methodology exists by which to make ethical decisions; the egoist affirms this claim. Relativism, accordingly, allows for greater ethical variation. The relativist can, if he or she desires, act in his or her own self-interest, or in the interest of others or on the basis of no rational considerations at all. The ethical egoist does or should always act in an openly self-indulgent manner. The egoist, for example, might appear altruistic. Egoism requires only that the primary reason for any form of ostensive behavior ultimately be self-interest.

When considering the question of deception, therefore, the egoistic social scientist must decide whether such a practice will benefit him or her personally. Such a decision would, of course, be relative to the perceived "interests" of each scientist utilizing this ethical methodology. Moreover, such a social scientist could well find himself or herself facing a moral dilemma. For example, an egoistic scientist might desire the professional fame he or she believes could result from an experiment utilizing an especially creative, but quite embarrassing, form of deception, but not desire the anticipated loss of respect by the subjects involved. In such cases, the egoist would need to develop a priority rating for the given "interests" involved and make a decision accordingly.

We see then that consequentialism allows for a wide variety of answers to the question at hand. But each social scientist who espouses this methodology faces a similar problem: the difficult task of attempting to predict future consequences.

3. *Nonconsequentialism (Deontological theories).* For the nonconsequentialist, an action is right if performed in accordance with accepted moral laws. The anticipated consequences are not relevant. Under non-consequentialism, accordingly, actions have intrinsic moral value.

Nonconsequentialist theories fall into three basic categories. The "intuitionist" believes that the right rule or specific action is known intuitively (self-evidently) by the morally mature individual. Not surprisingly, almost all "intuitionists" consider lying to be wrong. The "rationalist" believes that the right rule or specific action can be identified by the use of reason. Kant, for example, believed that an action was moral only if it could become a universal law without generating a contradiction. Moreover, he felt that under this principle lying is an immoral activity. For if everyone gave false promises (lied), he argued, the concept of "telling the truth" would become meaningless and thus lying, itself, would become impossible (self-contradictory). Most other "rationalistic" nonconsequentialists agree that lying is wrong. Finally, the "revelationist" believes that the right rule or specific action in any situation is that which is (or has been) dictated by God in some form of written or "mystical" communication. Almost all "revelationists" believe lying to be intrinsically wrong.

It might appear that the social scientist who espouses a nonconsequentialist theory could not under any condition condone the use of deception in experimentation, but such is not necessarily the case. In addition to believing that lying is wrong, many (if not most) nonconsequentialists also believe that the acquisition of human knowledge, the alleviation of human pain and suffering, and the improvement of the quality of human life are morally proper activities. Hence, for such social scientists, the use of deception in experimentation generates a *prima facie* conflict. The experiments themselves, when viewed as a means to the

acquisition of knowledge—knowledge which is generally seen as potentially beneficial for humanity—must be considered good. But since such experiments necessitate the willful use of deception, they must also be viewed as morally unacceptable. Such a social scientist, accordingly, will be forced to violate an accepted moral norm. However, it must be emphasized that in making the decision to act in accordance with one moral principle at the expense of another, the social scientist would not be saying that an intrinsically unacceptable action can become intrinsically acceptable in some situations. He or she would simply be saying that circumstances sometimes dictate that an intrinsically unacceptable action must be performed in order to avoid the performance of an even less acceptable action. Such dilemmas, moreover, point out a fundamental difficulty facing the nonconsequentialist: the prioritizing of intrinsically good moral principles. Unfortunately, there seems to be no standard method for accomplishing this task.

We see then that there is no single philosophical response to the question of human deception in experimentation. One's response depends not only on one's basic ethical stance but on how one resolves the potential conflicts between various intrinsic or consequential "goods" which are inherent in each.[4]

A Theological Perspective

The question whether a Christian ought to deceive under any circumstance at first seems out of order. In Colossians 3 lying is viewed as a reflection of the old nature, and thus, Paul encourages Christians to avoid it.[5] But, in stark contrast to Paul's admonition, other passages of Scripture not only allow for deception but approve it. The Writer to the Hebrews characterized Rahab's concealment of the Israelite spies from the citizens of Jericho[6] as an act of faith.[7] We cannot claim then that there are no circumstances under which the Judaeo-Christian tradition allows one to conceal the whole truth. But is one of those cases that of research into behavior by a Christian psychologist? That is the question we want to deal with. In order to answer it we need to inquire: are there clear, biblical and theological principles that apply to the issue of using deception in psychological research? We proceed primarily by examining relevant scriptural evidence. Then we summarize how these results apply to our inquiry.

Scriptural and Theological Principles that Prohibit Deception

God is truth, he does not lie, and in his dealings with us he is reliable.[8] God's integrity, in fact, provides a basis for the structure of our relationships with him and with one another. God has entered into covenants with humans and the stability of these depends upon his truthfulness. Thus, Scripture calls him faithful (he keeps his word)[9] and righteous (his action conforms to his covenant commitment).[10] The dependability of God is so certain that we can confidently live in the face of obstacles and know that the future will be as he promised.[11] His purpose is not to deceive or lead us astray but to conduct us on the way of truth.[12]

From this affirmation about God we move to the corresponding one concerning the world he created. We can generalize by saying that he established truth as a principle woven into the fabric of the cosmos.[13] It is among the principles or laws by which this world (whether physical or social) operates. When the principles are ignored or violated disorder and chaos break out.[14] God will in some way and at some time bring the liar into judgment and punishment for his deed.[15] When we adhere to them there is stability—a natural, forward movement in which life prospers and is good.[16]

Thus, when the Bible describes an instance of deceit it also observes the results.[17] It is not as if a simple lie had been told and that was the end of the matter. Rather, deceit sets in motion a chain of events. Things can happen to make the chain move into different directions, but in no instance is the chain reversed as if nothing ever happened. The relation of deed and consequence is unbreakable. Thus, as a fallout of telling a falsehood, innocent people may suffer injustice.[18] Poverty and its tragic results may dog one because he has depended on deceit.[19] Lying causes a breakdown in social stability.[20] What if a wife cannot be certain of the word of her husband, a child of his parent, one neighbor of another,[21] a master of a servant, or a citizen of his king?[22] Second-guessing and cautiousness inevitably result when naive trust is betrayed. Oaths and securities are taken to quarantee a promise that will not stand alone.[23] And beyond all this there is the internal personal chaos that breaks out. The man who deceives, no matter what others think, knows what he has done and hence, is.

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He has eroded his own self-respect that results from integrity, skill, and diligence. He plays the game of concealing the truth not only from others but also from himself. This requires enormous psychic energy. The human exhausts himself juggling the data to hide the truth.[24]

A dependence upon deceit indicates a flaw in character, a defect in spirit.[25] The person does not live as God made and intended, and he cannot reach his potential of character development and moral achievement.[26] He has taken a short-cut to success and there is an inevitable loss in personhood. The use of deception reveals and aggravates this loss. One, for example, resorts to deception to conceal an evil action or thought rather than deal with it.[27] Consequently the evil persists and the new problem of deception makes it worse. Or people may deceive hoping to satisfy greed.[28] By lying they may succeed in overcharging for a product and get more for themselves.[29] On the other hand, people sometimes lie because they hate or have contempt for another.[30] They might rationalize that the other human being does not deserve an honest comment. What he is or who he is, is not their personal responsibility, and any thought or action that one can make to another's disadvantage because he is deceived is of no concern to him. Thus, the person who deceives believes that he can control others by deceit and that he has a right to do so.[31]

There are many cases in which biblical heroes are the subjects who deceive but in which the intentions are wrong and the actions are not approved, even when the long range objectives were identical with God's will. For example, both Abraham[32] and Isaac[33] deceived monarchs about their wives so that the kings, seeing and desiring the beautiful women, would not kill the husbands and place the women in their harems. In these instances, God's will, the preservation of Abraham's family, was not set aside by the sin of his servants. But it is also clear that God did not approve of the deceit and the patriarchs were publicly rebuked for it.

In the biblical view, then, something is wrong with the person who lies as a matter of course. He believes that it is his prerogative to manipulate others through deception and he, therefore, has an inadequate view of personhood. The use of lying breaks Scripture's basic principle of human relationship—love.[34] Whatever specific action we choose in a particular situation, it must arise from a love of the individual. This is not merely an emotion of sympathy or tenderness, but a motive toward positive, respecting and redeeming action. The dignity of the other human cannot be sacrificed for any reason or at any cost.

Scriptural or Theological Principles that Might Require Deception

The case against the use of deception might seem so strong that it excludes any exceptions. There are instances, however, of its use in Scripture which make such a generalization impossible. We need to examine these now to see how they make our inquiry more precise. There are three instances that we consider.

First, deceit receives divine approval, or at least tacit approval, when it is necessary to preserve life or the integrity of life.[35] In these cases there is a ranking of values. One tells the truth as a general policy, but in an instance in which telling the truth would forfeit someone else's life, one does what he can to protect it. Here there is not a choosing between a good and an evil but between the lesser of two evils.

Second, there are cases where God is the subject of the deceit, or at least initiates it. Exodus 3:16-20 reports how God intended to deceive Pharoah in order to liberate Israel from slavery. He instructed Moses to ask Pharoah's permission for Israel to go three days' journey into the wilderness and worship him there. Would they return afterward? This is not said although it is implied in the request. But obviously at that time God had in mind the eventual destination of the Promised Land rather than a three day detour in the desert. One of the reasons for this high level of manipulation is clear. Pharoah was of such a mind, arrogating to himself the role of a god, and was so given to injustice that there could be no appeal to his religious or humane motives. He would respond only to what he thought was to his best advantage; thus, he was deceived into furthering, not hindering, God's will.

Third, we consider another use of deceit that appears to have divine approval: deception to obtain understanding. An example of this is found in the Joseph story.[36] Long after Joseph's brothers had sold him into salvery, he rose to second place in Egypt's court, and during the seven years of famine was responsible for the distribution of the stored grain. When Joseph's brothers came to Egypt to buy grain, Joseph did not reveal himself to them for a good while. In fact, the things which he did before he finally disclosed his identity are very interesting. On their first trip to Egypt he accused them of being spies,[37] claimed that they lied to him,[38] threatened to put them all in prison,[39] finally did keep Simeon,[40] and then demanded that the next time they came they had to bring the younger brother.[41] He also returned their money secretly.[42] On their second trip his actions were even more complex. He assured them that the returned money was put there by their God,[43] gave a benediction over Benjamin,[44] ate with them seating them in order of age,[45] returned their money again,[46] and had his silver cup put into Benjamin's sack.[47] But then he had them overtaken and threatened the man who took the cup.[48] Finally, after Judah's offer of himself in Benjamin's place, Joseph revealed himself.[49]

Why did Joseph conceal the whole truth for such a long time? Biblical scholarship is always suspicious of attempts to psychologize the motives of biblical characters. There can be several reasons for a certain action; unless a story gives us a good clue, we must guard against projecting our own tendencies into the account. Perhaps there was some revenge in Joseph's mind. But the story also implies, especially because of the tacit approval, something like this: through his questions, demands, and actions, Joseph was able to determine the true character of his brothers, and he discovered that they had changed a great deal. Whereas previously they had been jealous and selfish, they were now repentant and willing to sacrifice themselves. Joseph would

have been unable to discover this, at least to its depths, without the testing. Here is a case in which concealment of truth was the means by which character and behavior traits were discovered.

In another case, the Bible reports how a prophet through deception revealed the enormity of a monarch's unacknowleged crime. David had committed adultery with Bathsheba[50] and then, to protect his legal innocence, had schemed for Uriah, her husband, to be slain in battle.[51] Here was someone in a powerful position who was not about to accept the truth of his own behavior. Nathan, the prophet, however, deceived David into revealing that his actions did not conform to his own values.[52] He told the king the parable of the poor man and his one little ewe lamb. After hearing how the rich man had mercilessly stolen the lamb, the king with righteous indignation pronounced the verdict against the powerful rich man. Then the prophet shattered the complacent, arrogant king with the charge, "You are the man." In this case, deception was necessary in order to compel a powerful and rationalizing person to admit the truth about himself.

On the other hand, Scripture by no means gives unqualified approval of its use. In general, deception contradicts the established principle of human relationships, arises from a defect in character, and inevitably introduces instability and distrust. The suspicion that sometimes surrounds psychologists conforms to this pattern.

Discussion

We now face the task of integrating these three perspectives. We acknowledge that there is room for honest differences of opinion on this issue. But, given our understanding of all the data at hand, it is our belief that under certain conditions, deception may be a justifiable technique for the Christian psychologist.

1. As nonconsequentialists, we consider deception to be intrinsically wrong. Therefore, even if it were decided that some greater good could be brought about by the use of deception, it must first be demonstrated that there is no other morally preferable methodology such as role playing that would be essentially as effective.

We do not subscribe to the popular scientific maxim that the pursuit of knowledge is justifiable under any circumstances.

Conclusion

There are at least three types of cases, then, in which a form of deceit is approved within Scripture and Christian theology: (1) Deception may be necessary to protect life or the integrity of life. (2) God may deceive a person who had determined to go contrary to the divine will in order to further his plan of salvation. (3) Deception may be used to test or reveal the truth about character and behavior. This third type comes closest to our inquiry about the use of deception in psychological research. Deception is necessary here because human nature tends to conceal the truth when its revelation would prove embarrassing or costly. By deception one can be brought to see the truth, even against one's will.

In the three cases where Scripture allows deception, it does so because of the human predicament in sin. One may have to lie in order to save a life from violence by another. God may use the rebellious person to further his plan of salvation by deceiving him. Or by deception, the truth about character or behavior may be shown where it would otherwise go unrevealed. This is not a perfect but a fallen world, and on occasion Scripture endorses deception to expose its fallenness or to protect the innocent. Therefore, with respect to our inquiry we can say the Bible and Christian theology allow for deception when it appears necessary to expose the truth about character and behavior.

We are especially attracted to the use of forewarning as an alternative to straight deception. From an ethical perspective even limited informed consent seems an improvement over straight deception in that the former shows greater respect for the subject's freedom of choice than does the latter. Unfortunately, not many studies directly testing the validity of forewarning as a research technique have yet been conducted, but the evidence to date suggests that forewarning and straight deception produce the same results. This may be the case because many subject populations are already aware of the psychologist's use of deception and are, thus, in this sense already "forewarned." Moreover, when a subject freely chooses to risk deception, we suspect that from a psychological perspective debriefing would be simpler and the relationship between subject and experimenter less vulnerable. It also seems that by at least partially taking the subject into his or her confidence, the experimenter takes a significant step toward removing the inequity between the roles of subject and experimenter.

However, we acknowledge that forewarning may not always be as effective as deception. There are some situations where advertising the possibility of deception may bias the results (especially under those conditions where the possibility of deception may not already be salient for the subject). This seems especially true when the research paradigm is moderately transparent. Our reasoning is that with

a clearly transparent paradigm the subject needs no clues to discover that deception is being used, while with a barely transparent paradigm no amount of prompting is going to allow the subject to penetrate the deception. Yet it should be noted that even if forewarning does allow the subject to discover the true purpose of the study, being at least partially brought into the experimenter's confidence may motivate the subject to put aside his hypothesis awareness and behave as naturally as possible. Of course, these speculations are subject to empirical test.

2. We do not subscribe to the popular scientific maxim that the pursuit of knowledge (no matter how potentially beneficial its application) is justifiable under any circumstances. More specifically, it is our contention that no amount of potentially beneficial information which an experimenter might gather by deceiving his or her subjects can justify the use of such deception if there exists the real possibility that the deceived individuals will permanently and/or severely be psychologically or physically harmed.

3. We realize that experimentation is at times undertaken primarily for the benefit of the researcher. However, while a desire for "personal gain" may not necessarily be wrong in all contexts, it is in our estimation never justifiable to use of manipulate another for personal advantage (monetary profit, prestige, or power). For to do so is to treat the individual in question as an object, someone we stand over-against in moral and personal superiority. We are equals in the challenges and responsibilities of life; and our duty is to respect, love, serve, even when professional expertise gives us an advantage. Accordingly, a necessary condition for the use of deception, we believe, is that the experimentation be undertaken primarily because of its potential for benefiting mankind.

Perhaps this and the preceding qualification can be stated most succinctly by saying that a Christian researcher's motives should always reflect a love for God and a love for man. In this context, if deception reflects a love for God, the researcher will examine his motives to determine if they are as pure as possible. If deception reflects a love for man, the researcher will be concerned about the relationship between himself and the subject, avoiding potential harm to the subject, and making sure the research has a potential for benefiting mankind.

4. Finally, we do not feel that the individual researcher is always the best judge of the value of, or motive(s) for, his or her research. Thus, when weighing the potential value of, or motive(s) for, research—especially research involving deception—it may well be helpful for the investigator to consult with colleagues and perhaps even a sample of the potential subject pool.

Our discussion to this point has, of course, been based on the assumption that deception can provide a path toward understanding. Christian psychologist Ronald Koteskey (1979) seems to find this assumption unacceptable. He argues that "the end of any process is inexorably embedded in the means used to reach it, so that a process which uses deceptive means cannot lead to truth. Thus, deception is not only not a legitimate means to truth, but not a means to truth at all." If we substitute "false" for "deceptive" in Koteskey's argument, there is a sense in which he is correct. A true conclusion cannot be deduced validly from false premises. But if Koteskey means that the experimenter who uses deception cannot arrive at empirically valid results (or results that are more empirically valid than those which would have been produced by non-deceptive means), his argument is dubious. First, deception is often used to duplicate a situation in the real world. And it seems reasonable to conclude that the closer an experimental situation is to its "real world" counterpart the more likely that paradigm is to reveal truth about how people typically respond. Secondly, as a result of the Fall, people are not always honest (especially when such honesty provides an unpleasant view of the self). Sometimes an effective cover story may help a subject to be more honest (at least in terms of the research question). This doesn't rule out the possibility that honesty can elicit honesty, but it does recognize that as a result of the fall there are certain limits to man's ability to be truthful. And since self-report often provides the primary dependent variable in an experiment, such a limitation is a significant concern.[53]

Conclusion

We have in our discussion attempted to articulate and defend one general perspective on the question of deception in experimentation. We, of course, realize that many thoughtful Christians may object strongly to our conclusions but find the prospect of such critical reaction encouraging. For it is our hope that this paper will stimulate further thought on the specific issue of deception as well as the more general issue of doing research within a Christian world-view.

NOTES

[1]All three authors contributed significantly to this project, and thus, we all accept equally the credit or the blame for its contents. In addition, we are indebted to Harold Hurley for responding to an earlier version of this paper and Ben Whitsel for contributing to the review of the psychology literature.

[2]For an extended discussion of the ethical issues involved with the Milgram obedience studies, see Baumrind (1964) and Milgram (1964).

[3]Note: Some authors have turned this question around and suggested the true criterion of validity should be role playing (Forward, Canter, and Kirsch, 1976).

[4]For a well organized, readable discussion of the various ethical theories I have mentioned, see Jacques Theroux, *Ethics: Theory and Practice* (Encino, California: Glencoe Press, 1977).

[5]The citations of scriptural references are by no means exhaustive. We have merely drawn on representative passages. Col. 3:9-10; cf. Eph. 4:25; Ex. 20:16; Deut. 5:20.

[6]cf. Josh. 2:1-21; 6:17, 22-25.

[7]Heb. 11:31.

[8]cf. Ps. 36:5-7; Rom. 3:1-7; 11:30; Titus 1:2.

[9]Deut. 7:9; Ps. 89:1-4; 1 Thess. 5:24.

[10]Ps. 85:10-13; 96:13; Jer. 12:1; Rom. 1:17; 3:21-26.

[11]Ps. 31:5; 57:1-3; 91:1-6.

[12]Ps. 25:8-10.

[13]Ps. 89:1-18; 96:10-13; Prov. 10:9.

[14]Prov. 11:4-6.

[15]Ps. 12; 59:6-13; 63:11; 101:3-5; Prov. 17:20; 19:5, 9; Isa. 29:18-21; 59:1-4, 12-15; Jer. 5:12-17.

[16]Ps. 34:11-14.

[17]Compare Gen. 27:5-30 with 32: 3-32, where Jacob has to face up to the results of his deceit.

[18]Prov. 10:15; 11:3, Prov. 12:13; 20:17; Prov. 14:11; 14:25; 15:27; 28:16.

[19]Prov. 12:19; 21:6.

[20]Prov. 29:12; 19:28.

[21]Prov. 25:18; 26:18b.

[22]Prov. 16:13; 17:7.

[23]Mt. 5:33-37 and cf. the entire cycle of the Laban and Jacob stories where the two are constantly trying to outmaneuver one another (Gen. 29-31).

[24]Ps. 32:3-4.

[25]Ps. 36:1-3.

[26]Prov. 19:22; 20:6.

[27]Ex. 32:22-24.

[28]Prov. 20:14.

[29]Prov. 21:6; Prov. 20:10.

[30]Prov. 10:18; 26:28.

[31]Ps. 62:3-4; Ps. 119:69.

[32]Gen. 12:10-20; 20:1-18.

[33]Gen. 26:6-11.

[34]Lev. 19:18; Deut. 6:4-5; Mk. 12:28-34•Mt. 22:34-40; Lk. 10:25-28; Rom. 13:8-10; Gal. 5:14; 1 John 2:7-11; James 2:8.

[35]1 Sam. 19:9-17.

[36]Gen. 37,39-50.

[37]Gen. 42:7.

[38]Gen. 42:15.

[39]Gen. 42:16.

[40]Gen. 42:24.

[41]Gen. 42:20.

[42]Gen. 42:25.

[43]Gen. 43:23.

[44]Gen. 43:29.

[45]Gen. 43:33.

[46]Gen. 44:1.

[47]Gen. 44:2.

[48]Gen. 44:4,17.

[49]Gen. 45:3.

[50]2 Sam. 11:2-5.

[51]2 Sam. 11:6-25.

[52]2 Sam. 12:1-10.

[53]For another response to Kotesky, see Johnson (1979).

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Land and Life: The Threatened Link

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A review of global, national and regional trends indicates that large quantities of food-producing land are indiscriminately being converted to non-agricultural uses. An analysis from a Christian perspective reveals that economic determinism rather than biblical stewardship is the societal norm governing man's use of foodland. Creational stewardship is proposed as a biblical norm for managing all creational resources.

God created the earth with amazing potential to produce life-sustaining food. For life to continue, man is given the biblical task to nurture the land, to care for and tend it responsibly. This task is rooted in honoring the Creator and serving one another by producing food and fibre. God owns the land—we use it as His stewards.

This view challenges a fundamental premise of our society. Compared to other life-sustaining resources such as air, water and solar energy, land is a creational resource which can be claimed as private property. Exclusive ownership is legally entrenched in a land title. Precedent and regulations stringently preserve the private ownership concept.

Perhaps nowhere is the notion of private property more explicit than in the market place. Land bought and sold is dictated by supply and demand. Possession is exchanged for a negotiated price. The market is the allocator of the land resource. Land is a commodity. Absolute ownership is assumed.

In our society, economic determinism overrides the biblical views of ownership and stewardship. The consequences of this inverted regulating principle threaten the created link between land and life. Land most suited for the production of life-sustaining food and fibre is often irreplaceably lost to uses for which it was not intended. Many areas recognized for their significant food-producing

potential are no longer available for food production. Most alarmingly, the threat continues.

Foodland losses may soon reach paramount proportions given future population projections and the food, facilities, and services needed to accommodate this population growth. There appears to be little awareness that the continual loss of food-producing land is becoming a serious problem. This article is an attempt to increase the level of awareness by examining global, national, and regional trends that reveal foodland losses and to place this problem within the context of creational stewardship.

Magnitude of Foodland Losses

Foodland is a finite resource. Only 11% or 1.5 billion hectares (1 hectare = 10^4 square meters) of the world's land surface is arable. Population growth however is an increasing phenomenon. The world's population is now over 4 billion and is projected to increase to 6 billion by the year 2000. As a result, an unprecedented demand on the earth's arable land base can be expected from competing uses such as housing, transportation, industry, resource extraction, and recreation.

Global Trends

Insufficient data are available to accurately indicate global losses of agricultural land but rough estimates have been made. Biswas and Biswas (1978) estimate that between 50 and 70 million hectares of land are removed from production every year by all causes. These causes include soil degradation, erosion, desertification, urbanization, transportation and so on.

A projection by the Worldwatch Institute estimates that expanding cities alone will cover 25 million hectares of cropland between now and the end of the century (Brown, 1978). This projection assumes, probably conservatively, an increase in the world urban population of 1.6 billion and an increased urban area of 63 million hectares of which 40% is cropland.

The amount of arable land available per person is expected to decrease from 0.34 hectare at the present to 0.25 hectare at the end of the century (Brown, 1978). This calculation, based on population growth alone, does not include arable land converted to uses (e.g., housing) needed to accommodate this population increase. If accurate data were available, a more realistic figure would be lower.

Losses of food-producing land will likely be highest in third world countries. These countries tend to have a higher rate of population growth and a lower rate of arable land available per person (Table 1). For example, Canada has a 0.8% annual rate of population growth and 1.8 hectares of arable land per person compared to 3.5% and 0.1 hectare, respectively, in Surinam. Significantly, it is precisely in Third World countries where the need to retain agricultural land is the greatest.

Compared to other life-sustaining resources such as air, water and solar energy, land is a creational resource that can be claimed as private property.

National Trends

Information describing foodland losses on a national basis is more readily available, particularly for developed countries where reliable data-gathering systems are usually in place. Availability of information led to the selection of Canada, Japan and the United States for a more detailed examination of national foodland losses.

Canada

Canada is the second largest country in the world and has a relatively high amount of arable land per person (Table 1). However, a vision of Canada as a vast agricultural plain is deceptive. Merely 13% (119 million hectares) of the total land area is potential agricultural land. Of this amount, 42% (50 million hectares) is arable and 19% (22 million hectares) is prime cropland (Science Council, 1977).

A comprehensive study of the conversion of agricultural land to urban uses was conducted in 1977 (Gierman, 1977). Both area and quality of agricultural land converted to urban uses were considered for 71 urban population centres of 25,000 or more. Area was determined using historical land use maps. Quality was determined using the soil capability for agriculture classification of the Canada Land Inventory (CLI). This classification employs a scale of 1 to 7 to identify limitations for arable agriculture. CLI soil classes 1, 2 and 3 have no, moderate, and moderately severe limitations, respectively. These classes usually constitute prime agricultural land. Soil classes 4, 5, 6 and 7 have severe, very severe, extremely severe limitations and no arable capability, respectively.

A summary of the study's results is shown in Table 2. The average annual rate of conversion for all soil classes was 14,337 hectares. Prime agricultural land (CLI classes 1, 2 and 3) accounts for 10,899 hectares or 76% of this rate. The conversion rate of lower quality agricultural land is substantially less. During the five-year span approximately 72,000 hectares of agricultural land were converted to urban uses of which nearly 55,000 hectares were prime agricultural land.

The study also found that in urban population centres of 25,000 or more, 44 hectares of arable land were converted to urban uses for every 1000 increase in population. If this trend continues, and assuming an urban population of 31

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Table 1

Population Growth Rate and Arable Land per Person for the World and Selected Developed and Developing Countries, 1979.

		Developed Countries			*Developing Countries*				
	World	*Canada*	*Japan*	*U.S.*	*Bangladesh*	*Ghana*	*Mexico*	*Nigeria*	*Surinam*
Population Growth Rate (%/yr)	1.7	0.8	0.9	0.6	2.9	3.1	3.4	3.2	3.5
Arable Land per Person (ha)	0.34	1.8	0.1	0.9	0.1	0.2	0.4	0.3	0.1

Source: Brown (1978), Gabel (1979)

million in the year 2000, about 308,000 hectares of arable land will be converted to urban uses. Since this estimate does not include conversions to non-urban transportation, recreation and resource extraction, actual losses would be higher.

These trends indicate significant foodland losses in Canada. One reason is that prime agricultural land is often located adjacent to population centres. More than one-half of Canada's CLI class 1 soils are located within an 80-kilometer radius of Canada's major cities. Ironically, most of Canada's modern settlement patterns began precisely because they were historically located in fertile farming areas.

Japan

The amount of arable land per person (0.1 hectare) is significantly lower in Japan than in either Canada or the United States (Table 1). As a result, very intensive farming is practiced in an effort to meet national food requirements. However, food demand surpasses Japan's agricultural production capacity resulting in net food imports.

Despite a very small arable land base of five million hectares, serious losses have eroded this base even more (Gabel, 1979). The main factors affecting the loss of arable land for the period 1968 to 1974 are shown in Table 3. This six-year span witnessed a total loss of about 388,000 hectares of arable land, representing 7.7% of the total arable

Table 2

Conversion Rates of Agricultural Land of Various Capabilities to Urban Uses in Canada, 1966-1971.

CLI Soil Capability Class	*Limitation to Crop Production*	*Average Annual Conversion Rate (ha/yr)*	*Percentage of Total Area Converted (%)*
1	none	3138	21.9
2	moderate	4488	31.3
3	moderately severe	3273	22.8
Subtotal		10899	76.0
4	severe	1907	13.3
5	very severe	992	6.9
6	extremely severe	539	3.8
Subtotal		3438	24.0
Total		14337	100.

Source: Gierman (1977)

land area in Japan. The largest consumers of arable land were housing and urban services accounting for 54% of the total loss, followed by forests and parks (19%), communication systems (14%), and industry and mines (13%).

Given a relatively moderate annual rate of population growth (0.9%), pressure to convert remaining food-producing land to non-agricultural uses can be expected to increase. Yet, every available hectare is important to reducing reliance on food imports. Japan may become increasingly reliant on a global interdependence for its food, energy and raw material requirements.

United States

The United States has about 218 million hectares of arable land representing almost 25% of its total land area. About 76% of the arable land area is under cultivation and the remainder is potentially available but this would require drainage, irrigation and other large-scale improvement projects. The recently completed National Agricultural Lands Study (NALS) estimates that most, if not all, arable land will be under cultivation by the year 2000 (NALS, 1981).

Even with this immense reserve, the country is losing foodland at an alarming rate. Housing, transportation and related urban services are major factors affecting this loss. NALS provides useful up-dated information on national foodland losses. Using data from the National Resource Inventory, NALS maintains that about 9.5 million hectares of agricultural land were converted to nonagricultural use between 1967 and 1975 (Table 4). Cropland losses amounted to 2.2 million hectares for this period. Annually, nearly 1.2 million hectares of agricultural land were converted of which 400,000 hectares were from croplands. Although there is potential cropland to replace this loss the reserve is only temporary and will probably be unavailable beyond the year 2000.

The amount of arable land available per person is 0.9 hectare (Table 1). This figure will probably decline to approximately 0.6 hectare by the end of the century, assuming an annual 0.6% increase in population growth and a loss of 400,000 hectares of arable land annually.

Unless agricultural production increases dramatically, population growth and cropland losses will seriously affect the domestic food supply and agricultural exports of the United States. NALS recognized this problem by concluding:

> Given projected demand increases for U.S. agricultural products in the coming years, particularly for exports, and the uncertainty regarding future gains in crop yield per acre (productivity), the economic and environmental costs of continued conversion of the nation's most productive agriculture into housing tracts, shopping centers, industrial sites and reservoirs could be very high within 20 years. (NALS, 1981: 17).

Since the United States is the world's major net exporter of food, an uncertain future confronts those nations that are consistent net importers of food. A majority of the world's countries are now in this category.

Table 3

Loss of Arable Land in Japan, 1968-1974.

	Housing and Urban Services	*Industry and Mines*	*Communication Systems*	*Forests, Parks, etc.*	*Total*
Area (1000 ha)	208.8	49.1	55.1	74.7	387.7
(%)	53.9	12.7	14.2	19.2	100.0

Source: Biswas and Biswas (1978)

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Table 4

Agricultural Land Converted to Urban, Built-up, Transportation and Water Uses in the United States, 1967-1975. (million hectares)

Census Region	Cropland	Pastureland and Rangeland	Forestland	Other Agricultural Uses	Total
West	0.3	0.5	0.2	0.2	1.2
North Central	0.7	0.3	0.3	0.9	2.2
South	1.0	0.9	1.6	1.4	4.9
Northeast	0.2	0.04	0.6	0.4	1.2
Total	2.2	1.7	2.7	2.9	9.5

Source: NALS (1981)

Regional Trends

Much more accurate information describing foodland losses is available at the regional and local levels because these traditionally form the basic land use planning units. Extensive quantitative analyses document permanent losses of considerable amounts of highly productive land in many regional and local areas. Examples of areas where these losses are well-documented include the Niagara peninsula in Ontario and the Okanagan and lower Fraser Valleys in British Columbia. The experience of these areas, and others, is a reminder to preserve prime agricultural land in those areas where it is not yet too late.

A survey of regional and local foodland losses is beyond the scope of this article. Instead, a case study approach is used to show that foodland losses are confined not only to extremely favorable soil and climatic areas, such as the fruitland areas cited above, but are becoming increasingly prevalent in many areas still secure in the illusion of boundless quantities of prime farmland.

The areas selected for this case study are the Calgary and Edmonton urban regions located in the province of Alberta. Both regions are dominant centres in the western prairie provinces, the heartland of Canada's primary agricultural industry. These two regions were selected because (1) energy related economic development is generating unprecedented direct and indirect pressure on the prime agricultural land base, (2) there is still sufficient time to institute policies and planning mechanisms to preserve much of the prime agricultural land base, and (3) there is generally little awareness of foodland losses in this region, a prerequisite to initiating steps to preserve prime agricultural land. For discussion purposes, data pertaining to the two centres are combined to form one geographic unit.

Calgary-Edmonton Urgan Region

A brief overview of land use in the Calgary-Edmonton urban region reveals that agriculture is the dominant land use activity, occupying 74% of the region (Thompson, 1981). Almost one-half of the agricultural area is devoted to cropland and one-quarter to pasture (improved and unimproved). Urban-associated uses account for 12% of the region's area. Most of this consists of urban built-up areas with transportation facilities occupying 1% and resource extraction industries and recreation together occupying another 1%. Natural areas occupy about the same area as urban-associated uses.

A recent analysis of rural land use changes in the Calgary-Edmonton urban region provides valuable data indicating the loss of agricultural land over a ten-year period (Thompson, 1981). About 76,500 hectares of rural land were converted to urban uses in the region between 1968 and 1977/79 (Table 5). More than one-half of this amount consisted of prime agricultural land, defined as soil classes 1, 2 and 3 of the Canada Land Inventory (CLI) classification for agricultural capability. Areas with these soils are best suited for sustained agricultural production. An additional 20,000 hectares of CLI soil classes 3 and 4 were converted to urban uses. Although these classes are of lower agricultural capability they are of sufficient quality for arable crop production. In total, almost 8% of the agricultural land in the Calgary-Edmonton urban region was converted to urban uses within a ten-year period.

Future conversion of agricultural land to urban use is difficult to predict. Energy-related economic development that is currently generating an unprecedented demand for developable land will likely continue in the foreseeable future. The area suitable for urbanization that does not include prime land for agriculture and recreation is estimated to be 190,000 hectares (Thompson, 1981). This represents about 19% of the total area of the Calgary-Edmonton urban region. Future pressure to convert prime agricultural land to urban uses will likely increase.

A process that will affect the agricultural land base in the future is annexation. The City of Edmonton's 1979 application to the provincial government to annex land from surrounding, predominately rural, municipalities is a case in point. Reasons for the City's annexation application included additional land requirements to accommodate projected urban growth until 2020 and, just as importantly, de-

velopment control in the rural-urban interface, a lucrative tax-generating area. In 1980, the Local Authorities Board (LAB), the government's annexation review agency, recommended that the City be granted approximately 50,000 hectares (LAB, 1980).

The LAB's recommendations have important implications for the agricultural land base. Approximately 55% or 27,300 hectares of the recommended annexation area is characterized by CLI soil classes 1 and 2 (Pettapiece, 1981). Within the Edmonton region, areas with these soils are also climatically favoured because of a slightly longer frost-free period. About 31% of the recommended annexation area is characterized by soil classes 3 and 4.

Cabinet approval of the LAB's recommended annexation area could mean considerable foodland losses. Such a decision may set a precedent for other municipalities to annex large areas from rural municipalities. The City of Lethbridge, for example, is considering annexing an eight-kilometer radius around that City.

As economic development and population increases, land will be required for a variety of uses. Increasing demands will be placed on the agricultural land base. Of crucial importance is the location and quality of the land that will be used to accommodate these demands.

Global, national and regional trends indicate that significant amounts of valuable food-producing land are being indiscriminately converted to non-agricultural uses.

Conclusion

Global, national and regional trends indicate that significant amounts of valuable food-producing land are being indiscriminately converted to non-agricultural uses. Prime agricultural land, a creational resource, is often permanently lost, no longer capable of fulfilling its created task to produce life-sustaining food and fibre.

From society's perspective, the problem of foodland losses is attributable to inadequate farmland preservation policies, an absence of protective legislation and regulations, a lack of political will, public apathy, an illusion of infinite land reserves, and so on. From a Christian perspective, the problem has a much deeper root: biblical creational stewardship is not a societal norm governing man's use of the created elements.

Table 5

Agricultural Capability of Land Converted to Urban Uses in the Edmonton and Calgary Urban Regions between 1968 and 1977/79.

CLI Class	*Limitation to Crop Production*	*Area Converted (ha)*	*Per cent of Total Class Area Converted*	*Per cent of Urban Region*
1	none	10,844	14.2	1.1
2	moderate	16,132	21.1	1.6
3	moderately severe	15,170	19.8	1.5
Subtotal		42,146	55.1	4.2
4	severe	10,967	14.4	1.1
5	very severe	9,876	12.9	1.0
6	extremely severe	5,488	7.2	0.5
7	no arable capability	251	0.3	0.0
Subtotal		26,582	34.8	2.6
Organic		976	1.3	0.1
Unclassified		6,742	8.8	0.7
Subtotal		7,718	10.1	0.8
Total		76,446	100.0	7.6

Data for Edmonton from 1977; data for Calgary from 1979.

Source: Thompson (1981).

Creational stewardship is a biblical norm for managing the elements of creation in such a way that the Creator is revealed, His glory and honor fulfilled, and the well-being of His creature maintained.

A major point of divergence between the two perspectives is the view of ownership (Boodt, 1976). Society views ownership as a right that establishes an absolute relationship between an owner and an object. The aim is to accumulate possessions.

Scripture places limits on ownership, not by restricting the number of things that can be owned (think of Abraham, Joseph and Job), but by identifying the true owner and attaching responsibility to ownership. All things belong to the Lord, the Creator (Psalms 24: 1). Ownership is a gift from the Lord. This gift defines the limits of ownership. All living and non-living things function according to the laws of creation. Their intended creational purpose is to be preserved. The elements of creation are to be allowed to express their created potential. Man must honor and respect these limits of ownership because as the earthly owner is subject to God, so is the object of ownership subject to God.

Biblically speaking, the responsibility attached to ownership is a calling to share and enjoy the beauty of creation. The object of this responsibility is not to accumulate possessions but to exercise creational stewardship. Creational stewardship is a biblical norm for managing the elements of creation in such a way that the Creator is revealed, His glory and honor fulfilled, and the well-being of His creature maintained.

Continual losses of agricultural land best suited for producing life-sustaining food and fibre is but one indication that creational stewardship is an unaccepted norm in society. Acceptance is not apparent even when the link between land and life itself is threatened. One is reminded of Amos, the farmer from Takoa, who, after seeing a vision of farmland being consumed by fire, begged the Lord to stop His judgment on the nation of Israel for its persistent unfaithfulness.

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An Extended Book Review Essay

THE POST-DARWINIAN CONTROVERSIES

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Based on The Post-Darwinian Controversies: A Study of the Protestant Struggle to Come to Terms with Darwin in Great Britain and America, 1870-1900 *by James R. Moore. London, New York and Melbourne: Cambridge University Press, 1979. This is part four of a four-part essay.*

Theological Resolution

Moore is intrigued by two related questions. What were the ingredients of Darwin's thought that made his theory of evolution so readily accessible to these conservative Christians? What were the ideas in conservative theology that enabled them to embrace Darwinian evolution so readily and even eagerly? In Chapter 12 we come to sections that surely will bemuse many of Moore's readers, because he writes that the world views of Darwin and of these conservative Christians had much in common.

Darwin's Orthodoxy

As to the first question (p 307-314), Darwin's thought was shaped by the tradition of natural theology, which sought to find evidence in nature for the existence of God. His course of study at Cambridge University included books by the Rev. William Paley, who was archdeacon of Carlisle and later a canon of St. Paul's cathedral in London. So impressed was Darwin by these books that he promptly tackled Paley's *Natural Theology, or Evidences of the Existence and Attributes of the Deity collected from the Appearances of Nature* (1802). After his circumnavigation, Darwin read the *Essay on the Principle of Population as It Affects the Future Improvement of Society*...(1826), which was published anonymously by the English economist and demographer, the Rev. Thomas Malthus, who taught history at a school sponsored by the East India Company. Darwin's view of the natural world and of how it operates was strongly influenced by the writings of these two clergymen.

In 1859 Darwin wrote that he "hardly ever admired a book more than Paley's *Natural Theology,*" and that he "could almost formerly have said it by heart" (p 309 in Moore). Paley developed the so-called teleological argument for the existence of God, which he adduced from evidence he saw of design in nature. Moore finds significant similarities between the *Natural Theology* and the *Origin of Species,* such as the heaped-up examples from plants and animals, and the method of reasoning on matters of opinion. Paley described the eye, and so did Darwin. Paley's "materials" became Darwin's "variations." Darwin was especially taken by Paley's concept of natural law, and I think this concept must have been a major influence on Darwin's thinking. Paley believed in what he defined as a "ruling Providence"—in God whose power penetrates to the "inmost recesses of all substance." Yet God and the world were distinct. "Neither the *universe,* nor any part of it which we see, can be he," Paley insisted (p 322). Reflecting his Christian view, Paley deprived nature of any occult or self-regulating principles, and so did Darwin. For Paley, "it is a perversion of language to assign any law, as the efficient, operative cause of any thing" (p 310), and a natural law was but a human description of events and causes brought about in nature by God. Darwin's principle of natural selection similarly embodied this empirical view of how change occurs in nature. Malthus' reasoning ability also impressed Darwin, and in the constraints that Malthus placed on the tendency of a population to increase we see at least one reason why Darwin rejected any notions of utopian progress like those heralded by the Spencerian "Social Darwinists." Yet Darwin, like Malthus, did believe that the human condition could improve, and this belief, thinks Moore, was "the legacy of a Christian view of history" (p 314).

Paley and Malthus both believed that nature, as the work of God, was fully contingent, that is, that nature was not

"The orthodoxy of Darwinism was that, not of its author, but of the theology of nature which his theory presupposed."

controlled by any inner necessity, and their elaboration of this view strongly influenced Darwin's work. Moore continues, "For Darwin as for Christians, the world is a real historical place; its events are a meaningful and unrepeatable sequence; its purpose includes human beings but is not fully realized in them" (p. 308). On my first reading of these sections in Moore's book I clung to the sentences line by line, half-thinking I might turn the page to find that he would make a closet Christian out of Darwin, knowing this could not be. Moore explains: "The orthodoxy of Darwinism was that, not of its author, but of the theology of nature which his theory presupposed" (p. 345).

In the section on "The decline of Darwin's theology" (p 314-326) we are led step by step with Darwin until he has left Paley's notion of divine "contrivance" far behind, to enter the arid regions of deism and agnosticism. Darwin's faith foundered on the limitations of human reason as he conceived them. Because the Creator's purposes were unknown, he could not see any theological meaning for variability and fecundity. Did the manifold variations that are lost when natural selection secures an adaptation— variations in the coloration of flower petals, variations in the sizes of pigeon crops—each have a divine purpose? Hardly, thought Darwin. Superfluous laws would be required. And the myriad eggs that perished save the exception that became a fish—such waste was beneath the dignity of a benevolent Providence. No, said Darwin, natural selection proceeds without divine supervision.

A Note on the Design Argument

But the natural theologians would have said that even apparently fortuitous variations and excess fecundity were evidence for the design argument. Perhaps this is the place for me to interject a comment or two on the source of this time-honored idea, for all of Moore's Protestants were much exercised by the effect Darwinian evolution would have on the prevailing belief that biological structures and functions were marks of God's handiwork. Here we are at last, I think, at the heart of the Darwinian controversy.

Like all important ideas, the design argument did not spring up in full flower. The ancients, who did not always distinguish sharply as we do between the animate and the inanimate, saw order and regularity everywhere. Plato, for one, wrote of "soul" as a self-regulating principle within nature. Aristotle also thought that "purpose" must be inherent, and like Plato, he did not separate the source of this order from nature itself. In the Middle Ages, Thomas Aquinas adopted much of this reasoning, but he argued that God was the source of this order and regularity, and that God was separate from nature. This is the beginning of the modern statement of the design argument—that perceived order presupposes external intelligence and benevolence. Notwithstanding David Hume's brilliant disclaimers, enthusiasm for the idea waxed during the eighteenth century and in the first half of the nineteenth.

In 1802, these various strands came together in Paley's classical statement, his celebrated *Natural Theology,* which, incidentally, is a rather good survey of the science of the day, especially of biology. His book was influential on both sides of the Atlantic. It was published by the American Tract Society, and was used for a time as a text in colleges and seminaries. Paley multiplied example after example in his massive theme of design in nature. Just as a clock presupposes a clockmaker, said he, so do the intricate and elaborate structures of plants and animals entitle and oblige us to infer a Creator operating beyond nature. God must have created the human eye in its present form. To use fancy language, the design argument proceeded on the assumption that the end preceded the means.

Somewhere along the way this old concept presupposed a new ingredient, the fixity of species, and here we have the doctrine of special creation—the belief that individual species, and perhaps even separate structures like the petals of a flower, must be regarded as the result of direct action by the Creator. This, I think, was the view of design that Darwin rejected, not the view that nature in general was God's handiwork, which he believed, at least for a time; he rejected the view that every variation was the result of such direct action. As far as I can tell from a perusal of *Natural Theology,* Paley did not expressly say that God acted in so direct a fashion, and if I am not mistaken, neither did the early church fathers of the patristic age. Paley's teleology emphasized rather that God acted through natural law. In fact, the concept of natural law, to the extent that it embraces parts—in the plural—acting in concert, I should think would preclude the concept of such direct action on individual parts of the creation. Then again, perhaps Paley would not have agreed with me.

If the above sounds confusing, you have the Rev. William Paley to blame, for he was not altogether clear in the way he used his terminology. I should like to have asked him whether he thought his concept of natural law did preclude direct action by the Creator, as I think it must. He might have spared this world a good deal of arguing had he been clear on this point. On the other hand, the American mathematician and philosopher Chauncey Wright (not George F. Wright), who was a student of Gray, apparently thought that you can have natural law and direct action at the same time after all. But he may only have had his tongue in his cheek when he wrote about miracles: "To admit twenty or more (the more the better), as some geologists do, is quite enough to make them pious and safe. I would go even farther, and admit an infinite number of miracles, constituting continuous creation and the order of nature" (p 398, note 123). So, instead of a series of causally-related events you can have a string of miracles, you cap the lot with natural law, and you have special creation and science

all at once. Maybe this would be something like 'special evolution' or 'evolutionary creationism'!

Christian Orthodoxy

Whether Darwin's natural selection meant the demise of the design argument was the central concern for all the Protestant writers, and this brings me back to the second question that intrigues Moore, on the relevancy of orthodox theology for Darwinian evolution (p. 326-340). What was it about orthodox theology that prompted the Christian Darwinians to accept Darwinian evolution so eagerly, even while Darwin himself was losing his faith? Three points emerge from my understanding of Moore's analysis.

First, his Christian Darwinians began with the biblical doctrine of creation that was held by the Renaissance founders of modern science, including Francis Bacon. Moore elaborates their conception of this doctrine, as follows. Nature, as the product of divine creation, is separate from God, but God is actively present in nature through His benevolent providence. Such a belief has consequences for the acceptance of Darwinian evolution. Matter, of which living and non-living nature is composed, is devoid of life in the Greek sense or of any other self-regulating principle, they would have said, it is constantly in motion, and it is governed by natural law which imposes order and regularity. (This is the *natura naturata* of the philosophers of old.) Natural events are completely contingent, that is, they occur only because they are acted on by other natural events, and, because nature lacks the aforementioned internal, self-regulating principle, natural events do not restrict God's activity. These two principles, matter and natural law, are the basic and legitimate concerns of science; they are the result of God's voluntary action.

Such was the view of the seventeenth century author of the *Advancement of Learning* (1605), who declared that we must study the "book of God's word" and the "book of God's works," in the passage, Moore reminds us (p. 328), that Darwin quoted in his *Origin of Species.* Yes, we have come back to Francis Bacon again. His meaning was probably better understood in Darwin's day than in our own. Darwin and the Christian Darwinians knew what Bacon meant when he said that if ever we are to seek out the advancement of learning we must put aside the preposterous philosophies of the ancients, become like little children, and hasten to the book of Creation, even as we do to the Bible. In this larger sense alone, Darwin was the complete Baconian, the fulfillment of the seventeenth century Christian vision of nature.

Second, The Christian Darwinians boldly emphasized the doctrine of divine immanence—God is continuously active everywhere in nature. "We must frankly return to the Christian view of direct divine agency, the immanence of Divine power in nature from end to end," admonished Aubrey Moore, "or we must banish him altogether" (p. 338). A benevolent Providence became the theological analogue of natural law. But, following Paley's insistence that natural law does nothing and that to say that it does really means that natural law would be just another outmoded Greek, self-regulating principle introduced all over again (p. 310), they insisted that God was the active doer. They asserted instead that natural law was the human description of God's orderly action (p. 330).

The next step for the Christian Darwinians was easy. Natural selection is the human conception of Providence. Moreover, they all seemed to share with Darwin a high regard for Paley. Van Dyke, for one, expected that "some future Paley" would demonstrate that by means of natural selection "the Creator has left upon His handiwork innumerable traces of intelligent design" (p. 329). In sum, natural selection became the expression of a much-expanded and thoroughly transformed Paleyan teleology. And so the doctrine of divine immanence became the foundation of the Christian Darwinian acceptance of Darwinian evolution with the belief that natural selection was the manifestation of Providence. Acceptance by the Americans was strengthened by their Calvinism, with the belief that natural selection was the manifestation of Providence.

What is especially striking to me among these Christian Darwinians is their clear perception that "chance" was not an essential ingredient in Darwin's theory. Today we sometimes hear the objection, "Oh, I cannot possibly believe in evolution because it is based on chance"—notwithstanding

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Darwin's unambiguous statements and reasoning to the contrary. To Aubrey Moore, natural selection meant the "elimination of chance" (p. 329), because every species, every organ, every adaptation comprise both means and ends, the whole manifesting divine purpose and design. The same view appears in Gray's essay, "Design versus necessity" (1876, 1963). The assertion that nothing is due to caprice in the biological world arose from this belief in Providence, a belief, said Iverach, which rescues us "from the tyranny of chance" (p. 256). For these writers, chance meant only whatever was unknown about the process in nature. Similarly, McCosh in 1890 wrote that "The design is to be seen in the mechanism. Chance is obliged to vanish because we see contrivance. Supernatural design produces natural selection" (p. 335).

Third, this reconciliation of natural selection with Providence raised no major difficulties for these orthodox theologians. Certainly the meaning of variability and fecundity, which had left Darwin in that muddle, was no trouble at all to the Christian Darwinians. Moore writes (p. 334):

> Though Darwin found the difficulty "insoluble" and a hindrance to theistic faith, it did not appear as such to the adherents of that orthodox theological tradition which was inaugurated by Augustine, systematised by John Calvin, preserved in Scotland, transplanted in New England, and represented on both sides of the Atlantic in the nineteenth century by theologians of the Presbyterian and Congregational churches.

Moore develops the view that Calvin's theology provided the Christian Darwinians with the resources for reducing the conflicts or "dissonance" between Darwinian evolution and their Christian faith. Seeing the parallels between difficulties raised by Darwinian evolution and difficulties often faced by Christian theism, they felt no need to seek absolute answers. The ultimate meaning of every lost variation, the death of individuals in the struggle for life, and of the extinction of a species, all remain hidden in the mysteries of the providence of God, just as Christians manage to get on without understanding the meaning of suffering, and without reconciling free will with predestination. Even the major problem of relating man's unique origin with his relation to the animal kingdom faded away in the light of the unresolved problem of the origin of the human soul. Recalling the historic debate over whether the soul is propagated or specially created, Wright noticed an analogy between evolution and "traducianism" (p. 337).

The theological tradition carried forward by Augustine, Calvin, and Edwards promoted the acceptance of Darwinian evolution on both sides of the Atlantic by the Christian Darwinians. The Trinitarian and Calvinist doctrines enabled especially Gray and Wright to transcend the difficulties Darwinian evolution posed for their belief in Providence.

The conclusion of the book dwells on Darwin's refusal to mount an attack on the clergy, and his sincere efforts to offer a framework of theological ideas for his theory. Moore also brings to light Thomas Huxley's rather remarkable statements about Providence and orthodox theology.

Some Closing Remarks

As far as I can tell, Moore has not answered one question that might occur to some readers. Why did the Christian Anti-Darwinians resort to Greek thought in rejecting Darwinian evolution? While we are not surprised that some of the orthodox Christians at the time should have rejected Darwinian evolution by whatever means, Moore has shown how other orthodox Christians, equally zealous and sincere in their devotion to the Bible, did cast out Greek ideas. It is therefore curious, at least to me, that the special creationists should have fallen back on the Greeks for an exegesis of their view of creation. On the other hand, I do not wonder that the Greek components in special creationism are not recognized today—considering education today with the classics dismissed and history in general neglected. But certainly Charles Hodge knew his Plato and Aristotle, and he knew his Bacon, who reviled them. He must have realized that the source of his arguments was non-biblical.

Whether Darwin's natural selection meant the demise of the design argument was the central concern for all the Protestant writers.

Or did he? Moore is well-equipped, if anyone is, to throw light for us on the significant question of why the special creationists of the nineteenth century should have embraced Greek philosophy in the first place. Here is a subject for a fine paper! Most of his attention is devoted to the other two groups of Protestant responses, and his treatment is also fresh and striking. Of these two he tells us that (p. 303):

> It was only those who maintained a distinctly orthodox theology who could embrace Darwinism; liberals were unable to accept it. Christian Darwinism was a phenomenon of orthodoxy, Christian Darwinisticism, on the whole, an expression of liberalism. The correlation between Darwinism and orthodoxy was not inverse but direct.

I was relieved to find that Moore does not stray into side issues, like Noah's flood, missing links, and the primate ancestry of man, and I therefore gather that his Protestants steered clear as well.

If anyone seeks a polemic against the special creation movement of today, he would do well to look elsewhere. The current controversy is never mentioned. On the contrary, a special creationist of today will find in this book a lucid exposition of his position, as it was promulgated at its apogee in the nineteenth century. On the other hand, those who are concerned about the increasing attention enjoyed by special creationism today, will be able to ponder the trenchant asseverations of the conservative English theologians James Iverach and Aubrey Moore, and of the American Christians Asa Gray and George Wright.

Indeed, the serious student of Darwin of whatever persuasion will find in the extensive bibliography and footnotes a mine of rich information for further inquiries—topics galore: term papers for the harried graduate student, published articles for the worried tenure seeker. Special creationists can hardly do better than to look to Louis Agassiz, that special creationist *par excellence,* or to Charles Hodge, who brought fixity to Princeton and kept it there for a half century. Those of more liberal bent have the richest lode of sources. If anyone suspects that the value of a scientific theory is to be judged by the number of its adherents, resulting from a kind of public referendum or poll (that sort of thing has been known to happen), then he will surely cast his lot with the liberals, for they carried the field in Darwin's day, at least in numbers. Henry Drummond wants looking at, and so does Joseph Le Conte, I should think. As for the Christian Darwinians, they were in the minority, all right, but perhaps their erudition leavened the whole lump. Still, it is possible to wish that Moore might have located another Christian or two to join his four Darwinians in the wilderness. I think he could have put George Romanes here, instead of simply describing his career as an example of dissonance reduction (p 106-109). While remaining a Darwinian, Romanes moved from the faith of his youth to unbelief and back to Anglican orthodoxy at life's end. And does not James Orr deserve analysis somewhere? I've always thought that Gray's *Darwiniana* still makes good reading even after all these years, and in future I intend to dip into some Wright or Aubrey Moore.

The Judaeo-Christian idea of linear time was not an explicit theme in these Protestant writings. Still, the Darwinisticism people certainly were possessed of this idea, though implicitly; their evolution surged exuberantly straight toward a glorious denouement, for they thought progress was inevitable; that the inevitability of progress was not an inevitable result of Judeao-Christian thought was no obstacle to them. The Christian Anti-Darwinians could not accommodate linear time, because they were enamored of the Greeks, for whom time was circular. Possibly because the Christian Darwinians did not hold that progress was inevitable, they did not seem to deal with linear time *per se* in their deliberations. Without this idea, of course, the theory of evolution could never have been invented.

They asserted that natural law was the human description of God's orderly action.

An analogy from Renaissance astronomy comes to mind. There you have the conception of Tycho Brahe serving as a transition between the Greek cosmology of Ptolemy and the modern-looking system of Copernicus. Similarly, we might look upon Christian Darwinisticism as a kind of transition between the Greek-oriented Christian Anti-Darwinians and the more Copernican-flavored Christian Darwinians.

By now the attentive reader should be wondering why I have not disposed of Boyle's watch, which, after all, was used by the deists, although Boyle was a Christian. Scientific models come and go. Ceaseless and even directional change were found, first by astronomy in the heavens above, then by geology on the Earth beneath. And when Darwin applied the same concepts to biology, the world no longer could be regarded as a machine. Something that is undergoing directional and progressive change might make a machine, but cannot therefore be one. A world-machine is a finished product, fixed for all time, and cyclic with history repeating itself, as did the pointer on Boyle's watch. History never repeats itself in this world, and neither does evolution. Humans are excepted, of course, as they are given to repeating the past. The world is not the static thing that Boyle had in mind.

Years ago, at a writing conference of the Biological Sciences Curriculum Study in Boulder, Colorado, we had a discussion one day concerning the final sentence of the final paragraph of the second and succeeding editions of the *Origins of Species.* We wanted to quote this passage in the new high school biology texts, but the problem was what to do about Darwin's reference to the Deity. One faction held that the reference should be excised, because it was only an eccentricity on Darwin's part, and anyway, it certainly was not in keeping with modern science. A second faction demurred, holding that we should not tamper with what Darwin wrote, and therefore we should let the Deity be. The first faction lost, the troublesome passage survived unscathed, Deity and all, to be read by high school biology students all across the land (BSCS Blue, 1963, p 55; 1968, p 76; 1976, p 100). I think that Moore's book shows how mistaken we are if we suppose that Darwin was eccentric when he made all of his references to the Creator, or that, by so doing, he was only making concessions to his critics; and that we are especially mistaken if we think that those references are irrevelevant to understanding what science is all about, and how science developed through the centuries.

The strong impression arising from the whole is of the rich and diverse heritage of theological scholarship spawned by Darwinian evolution, and of the deep Christian foundation supporting Darwin's thought—which may be a surprise to biologists and theologians alike. This book is a *tour de force* in studies of religion and science.

Moore sums up the Protestant controversies as follows (p 350):

> Liberal Christians "tended to forget Darwinism" because, as we have argued, their theology was unable to accept it. Instead they were attracted to theories which could transform Darwinian evolution in accordance with their conception of the purposes and character of God. That the world is the outcome of God's omnipotent and beneficent design all Christians, orthodox and liberal, were agreed. Confronted with Darwinism, however, they differed over how this belief was to be maintained. Those who counted themselves members of established religious traditions, who concerned themselves with preserving historic deposits of truth, had at their disposal the unique resources for accepting evolution on Darwin's terms. Thus equipped, with Huxley they could say, "Not a solitary problem presents itself to the philosophical Theist, at the present day, which has not existed from the time that philosophers began to think out the logical grounds and logical consequences of Theism."

The strong impression arising from the whole is of the rich and diverse heritage of theological scholarship spawned by Darwinian evolution, and of the deep Christian foundation supporting Darwin's thought.

> Those, on the other hand, who turned against established theological traditions, who took scant notice of historic doctrines of creation and providence, cut themselves off from Darwin's world and from the resources by which, if Darwinism were true, it could be kept a Christian world. Left to the devices of modernity, they solved their theological problems with concepts of divine immanence, human goodness, and social and religious progress, only to have their evolutionary speculations embarrassed and undermined by future turns of events.

Early on I wrote that this book flows well. The author has given thought to the uses of grammar, and to the shape and sound of sentences. This is no mean discovery in a day when the English language is under assault from all quarters by those who presumably have received the benefits of a liberal education.

Printed in Great Britain, this book carries a price tag of $39.50 which surely will be more of an obstacle to dissonance reduction than any theological issue raised by Darwin. Inflation since the days of the post-Darwinian controversies will prevent this book from reaching its enormous potential audience on this side of the Atlantic—except in libraries. In October of 1981 the Cambridge University Press did help us out with an American paperbound edition, a *teleos* fulfulled, albeit with a majestic price of $19.95.

In addition to the reviews listed in part one (March), the book has also been reviewed in *The Economist* (July 21, 1979), *Naturrwetenschappelik Tijdschrift* (Oct., 1979), *New Statesman* (Oct. 12, 1979), *British Book News* (Nov., 1979), *Lychnos* (Yearbook; 1979-1980), *Choice* (Jan., 1980), *Medical History* (Jan., 1980), *Search* (March, 1980), *Books and Bookmen* (April, 1980), *Revue des Questions Scientifiques* (Louvain; April, 1980), *L'Action Vétérinaire* (May, 1980), *Southwestern Journal of Theology* (May, 1980), *American Historical Revue* (June, 1980), *Expository Times* (June, 1980), *ADRIS Newsletter* (July-Sept., 1980), *Victorian Studies* (Summer, 1980), *American Scientist* (Sept., 1980), *Themelios* (London; Sept., 1980), *Journal of Theological Studies* (Oct., 1980), *La Recherche* (Dec., 1980), *Churchman* (vol. 94, no. 4, 1980), *Science, Technology, and Human Values* (Fall, 1980), *Religious Studies Review* (Jan., 1981), *Grace Theological Journal* (Spring, 1981), *British Journal for the History of Science* (July, 1981), *History of European Ideas* (vol. 2, no. 3, 1981), *National Student* (Nov., 1981), and the *Reformed Journal* (May, 1982).

While the author's presuppositions are not veiled, he does not intend an apologetic for Christian theism. He begins by warning that "it does not at present seem obvious that Christian theology is best defended by historical accounts of its formative influence on modern science" (p 16), and he concludes by admitting that: "The struggle to come to terms with Darwin has not yet ceased" (p 351).

Postscript

Because of the timeliness of the subject matter, and of the high price of the book, I have thought that a full treatment might be agreeable. The length of this essay means therefore that it is not the usual sort of book review. While striving for the balanced and authentic digest, I have not hesitated now and again to intrude my own interpretations and exegeses of Moore's point-of-view, and I have also dilated freely on particular topics that struck my fancy when they rose up before me from his pages. Thus you find my digressions on Bacon, Agassiz and Gray, the uses of language, deism, scientific method, the design argument, and assorted other interpolations, all of which I should think you can identify as my own. Although I held fast to the book at hand, from time to time while writing this essay, during the March and April weekends of 1980, I did repair to the bookshelf for added refreshment, and there I dipped into Agassiz's *Essay on Classification* (1859, 1962), the Lord Chancellor's *Novum Organum* (in the Spedding and Heath edition of 1863, 1960), E. A. Burtt's *Metaphysical Foundations of Modern Physical Science* (1924, 1954), R.G. Collingwood's *Idea of Nature* (1945, 1960), the sixth edition of Darwin's *Origin of Species* (1872, 1958), A. Hunter Dupree's *Asa Gray* (1959, 1968), Benjamin Farrington's *Francis Bacon* (1949, 1961), R. Hooykaas' *Principle of Uniformity in Geology, Biology and Theology* (1963), and, of course, Paley's *Natural Theology* (1802, 1963). And I located Boyle's watch on p 245 of something of his called "A Free Inquiry into the Vulgarly Received Notion of Nature," which you can peruse in volume 5 of the 1772 edition of his *Works*. I consulted Boyle in the Newberry Library in Chicago. The Bacon presence is also my doing. He does not suffer analysis with Moore's Protestants. Of course, only the valiant of heart can write on Bacon without putting in those sprightly remarks by King James and William Blake. Farrington perpetuates the former on his p 121, and Basil Willey passes on the Blake on p 19 of his *Seventeenth Century Background* (1933, 1953). The snappy Bacon epigram with which I began is from his essay, "Of Studies" (probably in 1597). The Cambridge University Press kindly granted me permission to quote the numerous passages from Moore's book. No doubt I have missed my way now and again, but this is a risk happily seized when transgressing unfamiliar and altogether fascinating terrain. If you have misgivings about anything I say, fine! then you might be the more inclined to look into these matters on your own.

Notes on "Science and the Whole Person"—
A Personal Integration of Scientific and Biblical Perspectives

Part 18

Biological Control of Human Life

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In the last two installments we have faced the ethical dilemmas associated with human intervention in the development of fetal life through abortion, and in the ending of human life. There are, however, an equal number of ethical problems associated with variations in the beginning of human life and the biological control of human life in general, variations that have become possible for us because of advances in biological science.

All of these ethical problems are summarized in the same refrain: "Is it right for human beings to 'play God'?" The implication behind the question is that the natural order of creation gives to us the will of God for that creation[1] and that when we interfere with, attempt to change, or propose to augment that creation, we are usurping the prerogative that belongs to God alone. The emphasis on the "natural" in Roman Catholic ethics attempts to codify this perspective. If changing the natural order is to "play God," however, we have no choice but to "play God" to some extent—and indeed is that not the implicit meaning of faithful stewardship: to "play God" on God's behalf in the world over which he has given man responsibility? This is by no means license to do whatever it is possible for us to do, but neither is it a reliable guide that separates the ethically improper from the ethically proper.

There are two reasons why we cannot place total faith in the "natural" to guide us in our actions. The first is that today's "natural" represents nature as appropriate for sinful mankind, hence a nature riddled with disease, famine, war, suffering, and evils resulting from natural phenomena and human immorality. Even pristine nature, therefore, does not reveal to us infallibly the relationships of unfallen, sinless reality. We recognize this implicitly when we "play God" by developing medicine, researching new food crops, building dams to prevent flooding, working against injustice, and confronting all aspects of nature that bring harm to mankind with the same unyielding faith that God's ultimate will is otherwise. Although we are wise, therefore, to recognize that the "natural" does represent some part of the revelation of God for us and our lives, we are foolish if we regard the "natural" as the final guide for Christians charged with being the firstfruits of a creation to be redeemed.

The second reason why we cannot place total faith in the "natural" as a guide to our actions is that it is impossible for human life to exist and develop in the world without changing the "natural." It has sometimes been said facetiously that the human race should be considered as a disease of the natural world, much as fleas are a disease of animals. In a real sense it is not "natural" for nature to be treated the way that human beings must treat it if they are to be true to their created nature. Every facet of culture and

civilization is a variation on the natural world. For human beings to attempt to return to the "totally natural" today would yield such an outpouring of human suffering and grief as would make any natural or man-made catastrophe of the past pale in comparison.

Recognizing that we cannot thoughtlessly use the "natural" as our ethical guide does not, however, tell us what is to replace it. Here the Christian must reach for insight into the meaning and extent of his/her God-ordained stewardship of the world and its resources, combine this with appreciation for the compassion of Christian love and concern, and top it off with a strong dose of the reality of human shortcomings, ignorance and sinfulness.

Taking account of human mental and moral fallibility can certainly lead to a very conservative approach to new techniques by which biological controls of human life are possible. Such conservatism does not lack proponents. Leon R. Kass, for example, has written,

> Let us simply look at what we have done in our conquest of nonhuman nature. We find there no grounds for optimism as we now consider offers to turn our technology loose on human nature. In absence of standards to guide and restrain the use of this awesome power, we can only dehumanize man as we have despoiled our planet.[2]

Paul Ramsey is even more outspoken,

> This area holds such *dangers* of untold human suffering, dehumanization, exploitation, radical alteration of the conditions of human existence, genetic SST's and Lake Eries, that we are obligated to search out ways by which regulatory policy can be devised.[3]

These and other similar words cannot be taken lightly. Nor can they, however, be taken as absolute in their restrictions on every case and every question. As usual we face the difficult case by case, and issue by issue, consideration of the outworkings of our scientific knowledge and our Christian commitment. If we are honest, we will confess that often we do not know where we are heading; under these conditions we will walk slowly.

In this installment we consider just three of the many possible topics that could be grouped under the heading of biological control of human life: techniques for new beginnings of life, cloning and genetic engineering. We will not deal at any length with the specific problems associated with recombinant DNA research, which have been described so extensively elsewhere.[4-6] In fact, although we need an appreciation of the principal contributions of the scientific advances, we do not in most cases need to consider the details of scientific research and enginering practice in order to come to an understanding of the major areas of ethical conflict.

New Beginnings of Life

For most of mankind's history, the failure of natural insemination methods left a man and woman without recourse. Does the fact that so many Christian men and women of the past accepted childlessness as God's lot for them and moved out to share their love in a variety of other ways, mean that efforts to secure pregnancy should be abandoned even if new techniques to achieve it become possible? Or should new techniques be welcomed as blessings from God that make it possible for men and women to have their natural offspring? Surely at least part of the answer to these questions must arise from the nature of the techniques themselves and the way that the process impacts on the identity of parenthood and the family.

If changing the natural order is to "play God," we have no choice but to "play God" to some extent.

If one considers the various formal possibilities by which fertilization and implantation might, at least in principle with present knowledge, be achieved, one arrives at a tabulation like that shown in the Table. This Table was constructed simply by considering that an ovum may come from the woman herself or from a donor, that the sperm may come from the man himself or from a donor, that fertilization may occur either *in vivo* or *in vitro,* and that implantation may occur either in the woman's womb or in that of a donor. This set of possibilities leads to 16 formal combinations, which may be reduced at least to no more than the 11 cases listed in the Table if obviously physically meaningless cases are deleted. Consideration of some of these cases reveals the types of problem to be confronted.[7]

The first case listed in the Table (WMVW) can describe either the case of normal insemination, or the case of artificial insemination in which the man's sperm is used (AIH for Artificial Insemination, Husband). The latter represents the first and the smallest departure from the "natural." Objection can be raised only if it is believed that impregnation must result from a normal act of intercourse and in no other way. To endow the act with such a significance when all the other requirements for parental and familial love and concern are fulfilled seems inappropriate. The additional aid to achieve fertilization through AIH seems suitable only for thanksgiving and gratitude, not for criticism or condemnation.

The second case in the table (WMTW) corresponds to what has been improperly called "Test Tube Babies." Preovulatory oocytes are removed from the woman and are fertilized with prepared sperm from the man in the laboratory. About 12 hours after fertilization the embryo is transferred to a solution that supports embryo development, and is kept in a special atmosphere with low oxygen pressure and some carbon dioxide. After 2 days the fertilized egg has become an eight-celled embryo; after 4 days it is an approximately 100-celled blastocyst. Sometime between 2 and 4 days after fertilization, the embryo is inserted into the woman's uterus, which may have been prepared for im-

Formal Possibilities of Fertilization and Implantation for a Particular Woman and Man

Label	*Ovum*	*Sperm*	*Fertilization*	*Implantation*
WMVW	Woman's	Man's	*In vivo*	In Woman
WMTW	Woman's	Man's	*In vitro*	In Woman
WMTD	Woman's	Man's	*In vitro*	In Donor
WDVW	Woman's	Donor's	*In vivo*	In Woman
WDTW	Woman's	Donor's	*In vitro*	In Woman
WDTD	Woman's	Donor's	*In vitro*	In Donor
DMVW	Donor's	Man's	*In vivo*	In Woman
DMTW	Donor's	Man's	*In vitro*	In Woman
DMTD	Donor's	Man's	*In vitro*	In Donor
DDTW	Donor's	Donor's	*In vitro*	In Woman
DDTD	Donor's	Donor's	*In vitro*	In Donor

plantation by hormonal treatment of the woman. If all goes well, the embryo implants and the normal course of fetal development begins. Several successful cases of such *in vitro* fertilization have now been followed through the birth of a healthy, normal child. Ethical questions have centered around possible damage resulting to the child because of the manipulation of the embryo in this procedure. Such dangers need to be given serious consideration, and involve one in all the dilemmas of abortion[8] if malfunctioning or malformation is discovered after implantation. Except for these dangers, the process itself, although hardly "natural," seems to cause no unique ethical problems since it once again involves parental and familial love, and only the ova and sperm of mother and father. The fact that the process has been labelled "Test Tube Babies" by the media indicates the misapprehension of the public when departures from normal reproductive schedules are followed: the term conjures up visions of babies being put together in test tubes, hardly a reliable image of the actual procedure.

Two other aspects of *in vitro* fertilization should be considered. The first is the argument that removal of fertilization from the home to the medical laboratory is a sign of disintegration of the family and dehumanization of the reproduction process. Indeed Kass points out that man's view of life and the world is reflected in the terms used to describe the generation of life: for the Hebrews, it is "Begetting" or "siring;" for the Greeks, it is "genesis;" for the pre-modern English-speaking Christian, it is "procreation;" for the modern entranced with mechanization, it is "reproduction;" in Aldous Huxley's *Brave New World* of tomorrow (today?), it becomes "decantation."[9] Here one must distinguish between what need be, what could be, and what probably might be. Certainly the use of *in vitro* fertilization *need not* be dehumanizing, although its widespread and indiscriminate use (especially with donor's ova or sperm) *could* be, and given our experience with human nature *might* very well be.

A second aspect of *in vitro* fertilization deals with the propriety of scientific research on human embryos obtained by *in vitro* fertilization of donor ova and sperm. We have seen above that in *in vitro* fertilization, the embryo has usually grown to about 100 cells before implantation; if the doctor slips and drops the embryo on the floor in the process, is he/she guilty of homicide? And what if the doctor fertilizes several ova in the effort to arrive at one suitable for implanting in this process, what does he/she do with the embryos not used? In research on mouse embryos, it has been possible to continue the development from the fertilized egg through almost one-half of the normal gestation period under wholly laboratory conditions. Mouse embryos have been frozen for periods up to one year with survival and normal development of 80% of these frozen embryos. It is evident that such processes may be beneficially used in the field of animal husbandry, particularly in the breeding of a superior strain of cattle for beef, for example. But what of the situation when and if these methods are applied to human embryos for the sake of research on the early development of human life, perhaps with the motivation of

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improving chances for survival or treatment of organic diseases?

At what stage of development does such a human embryo acquire the right to life and protection? Should such experiments be condemned completely because research on human life without the intention of bringing it to full expression is unethical? Suppose an experiment were ultimately successful and a viable baby was produced in the laboratory—who then would be responsible for this child brought into the world without either genuine father or mother? Only the most sensitive response to the value of human life is adequate for the task of sorting through the possibilities in these kinds of problems. Certainly it appears most desirable to restrict experiments to animal embryos until a great deal more is known about the result of such manipulations. Still our previous discussion[8] leaves open the possibility for responsible and responsive research on *early* human embryos in the effort to aid human beings in the future. It does not leave open, it seems to me, the possibility of raising a fetus totally in the laboratory, certainly not for experimental purposes.

As we proceed down the list of cases in the Table, it may seem that we are getting further and further from acceptable practice; and so we probably are, yet many such cases have already been considered. The third case (WMTD) applies to the situation where a woman is unable to carry her own child, but another woman offers to carry it for her; the fertilization is done with the man's sperm *in vitro* and then implantation is carried out in the donor's uterus. Supposing that this procedure can be done without damage to the child, is it ethically forbidden? Never mind the gross excesses that can be conceived of in this connection, of women earning a living by carrying babies of others unwilling to become pregnant, or "wombs for rent" and all the rest—but suppose the ideal case of a loving sister who is willing to give of herself so that her sister and husband may have the baby they so much want. In such a case could the action be one of self-giving love? Or is the injection of a third person, no matter how loving, into the family intimacy something that cannot be borne by human nature?

The fourth case (WDVW) is far more common than the third, and indeed is analogous to the first common case with the exception that a donor's sperm is substituted for the man's. There are more than 150,000 living Americans whose birth came about by means of AIH or this case, AID (Artificial Insemination, Donor). A host of objections have been levelled against AID: it constitutes a violation of the marriage unity, it involves not "natural" manipulation of sperm, it seeks to overcome God's ordination of infertility through the nonviability of the man's sperm, it is likely to have profound psychological trauma ultimately for both child and parents, and finally the charge that it constitutes adultery. It seems that we can dismiss fairly readily some of the more severe theological objections to AID, such as, for example, the claim that AID constitutes adultery (which mistakes the whole context of the sex act with the bare chemistry of the act), although we probably cannot dismiss the fundamental psychological injury to the family that is likely to crop up at any time (and may be the practical outworking of the theological objections). When AID is used to achieve the existence of "single parent families," we need to consider that phenomenon in its own dimensions and not simply as a case of AID. Overall the problems associated with AID, both theological and practical, appear to be an order of magnitude greater than those encountered in the first and second cases. In a day when overpopulation is a problem, and when uncared for children need all the care they can get, reaching out to AID seems excessive.

Taking account of human mental and moral fallibility can certainly lead to a very conservative approach to new techniques.

I leave to the reader to work out the implications and problems of the other cases enumerated in the Table, with just a few words of description. Case (WDTW) is analogous to the combination of "test tube" fertilization and AID, while case (WDTD) combines "test tube" fertilization, AID, and implantation in a donor's uterus. It quickly appears that such cases fall under their own weight of complexity and lack of correspondence with parental and familial concern. The last five cases in the Table are analogous to the corresponding cases above but with the substitution of a donor ovum for the woman's ovum, leading to artificial inovulation (DMVW and DMTW) with implantation in the woman and with implantation in a donor uterus (DMTD). The final two cases (DDTW and DDTD) can be regarded as unrealistic since they involve the fertilization of a donor ovum by donor sperm, with implantation in either the woman or in a donor uterus.

Some of the more unlikely entries in the Table may, however, be viewed with favor by those who see the possibility for eugenics in the control of ovum and sperm. We already know of the existence of a "Sperm Bank" in which leaders of high I.Q. and/or accomplishment are encouraged to make a deposit, with the belief that use of this sperm to fertilize "superior" ova will naturally result in improvement of the human race. Such dreams of a genetic utopia founder on several points in addition to the obvious one of mistaking genetic inheritance as all-important when compared to environmental effects of childhood, parents, family and home. Driven by the difficulty of equating desirable character traits in any simple manner with genetic material, proponents of such eugenic measures tend to identify intelligence as the ultimate, failing to recognize that intelligence may not adequately be tested by I.Q.[10,11] and that a genius may be an evil genius as well as a good genius. The importance of family and community relationships in building desirable character needs to be emphasized. When the means to achieve genetic eugenics directly

violate these relationships, the Christian has no choice but to reject them.

Cloning: Asexual Reproduction

A totally asexual means of reproduction is that known as "cloning." To make a clone, a mature but unfertilized egg is treated to remove its nucleus, which is replaced by a nucleus obtained from a specialized somatic cell of an adult organism. Since the nucleus contains the entire genetic code of the organism, the re-nucleated egg develops as if it had been fertilized, finally producing an organism that is genetically identical to the adult organism used for the new nucleus.

It is clear that in fields like animal husbandry cloning could make a major contribution. Although the procedure of cloning has not yet been successfully applied to a mammal, there appears to be no theoretical reason why it cannot be. The question of course arises as to why anyone would want to apply cloning to human beings even if it were possible.

A number of answers can be given to this question, at least some of them apparently in good faith. Cloning would allow for replication of individuals of great genius or great beauty; this answer implies at least partly that what the world needs is people of great genius, and that genius can be genetically specified. Cloning would allow the healthy to be reproduced, thus bypassing the risk of genetically related diseases; would make it possible to provide large numbers of genetically identical individuals for scientific research; would provide a child to an infertile couple; would make it possible to obtain a child with a genotype of one's own choosing; would permit the control of the sex of additional children; would permit the production of embryonic replicas of each person to be frozen as a source of organ transplants for their genetically identical twin; and finally we must not forget what is often the most powerful of reasons: to get the jump on the Russians and the Chinese!

I do not see how anyone, certainly not one seeking to work out Christian commitments, could advocate the attempt to develop human clones.

Sometimes the product of cloning is represented as some kind of freak in that he/she would be genetically identical with someone else. We should remember two things in this connection: (1) identical twins are genetically identical and usually manage to live independent lives, and (2) a person is not determined solely by his/her genetic makeup but also by the environmental experiences encountered; thus to have an identical genetic makeup is not to be an identical *person*.

Even granted this slight correction to common misunderstanding about clones, however, I do not see how anyone, certainly not one seeking to work out Christian commitments, could advocate the attempt to develop human clones. The reason is not that such a clone would be less than a whole independent person, but that the purpose and context of cloning do violence to the family and community structure which is essential for the full development of human capabilities and sensitivities. It is easy to believe that those who "produced" the clones would be likely to regard them as somewhat less human than themselves.

Genetic Engineering

A view of the biological development of living populations based on the theory of organic evolution regards strengthening of the gene pool as a natural consequence of the attempt to survive. Those creatures with defective genes resulting in an inability to survive have fewer offspring, and in the long run individuals with defective genes are minimized rather than augmented by largescale reproduction. Such a process may be considered to be in the best interests of the population as a whole, and of future individuals in particular.

When living creatures became human and recognized their high calling as unique creatures made in the image of God, the effects of organic evolution on the human population decreased, until the recent years when advances in medical understanding and capability have effectively eliminated them. This effect of medicine has, of course, been driven by the Judaeo-Christian understanding of the sanctity of all human life, not simply human life without genetic defects. This application of Christian concern leads directly to a dilemma of considerable magnitude. In the words of geneticist Theodosius Dobzhansky,

> If we enable the weak and the deformed to live and to propagate their kind, we face the prospect of a genetic twilight. But if we let them die or suffer when we can save or help them, we face the certainty of a moral twilight.[12]

Having eliminated the purely "natural" solution of the problem of genetic defects, i.e., leaving the individuals to fend for themselves so that the genetically handicapped do not survive to reproduce, the Christian is driven to provide some other kind of solution that will reflect the mission to reduce suffering in the genetic area.

A number of diseases are related to genetic defects; these include diabetes, phenylketonuria, sickle-cell anemia, hemophilia, cystic fibrosis, measles, German measles, mumps, chicken pox, smallpox, poliomyelitis, influenza, mononucleosis, and even the common cold, cancer and aging. The attempt to mitigate the effects of such genetic disorders may be considered under two headings: analogous to the categories of passive and active euthanasia, are the categories of negative and positive eugenics.

Negative eugenics attempts to eliminate genetic defects that are already present in individuals, or to prevent individuals with genetic defects from passing them on to their children. Such efforts take the form of counseling of prospective parents with genetic defects, genetic screening pro-

grams to inform individuals of the status of their genetic makeup, and the use of amniocentesis to detect genetic disorders (about 70 such genetic disorders can be detected between the 13th and 18th weeks of pregnancy) with the option for the parents to seek an abortion if genetic abnormalities do exist. Although an appreciable effort can be directed through the use of such practices to decrease the number of infants born into the world with genetic defects, even the most zealous application would be unable to eliminate genetic defects, and some of the ethical issues raised may negate the successes.

In a previous installment[8] we have considered the issues involved in the abortion of a fetus shown to have genetic abnormalities by amniocentesis. We have discussed the fundamental tensions that such a situation carries with it. We need to realize in the present context particularly the tension between the overall welfare of human society that is threatened by increasing genetic disorder and the specific desires and choices of parents concerning bringing a specific genetically handicapped child into the world. Underlying the whole issue, of course, is the Christian concern with the value of human life *per se,* regardless of genetic defects.

At the present time the state of our ignorance makes contemplation of genetic or fetal therapy to correct genetic factors leading to known genetic diseases a risky business. Human intervention into the "natural" world has not been without its notable failures. If genetic engineering should be allowed to produce in the human race the same kind of effects that we have produced in strip mining, water pollution, material waste, denuding of forest lands etc., we would finally face the ultimate pollution. But this must be interpreted as a call for caution, not as a call for lack of any research or action. Is there anyone who would not allow the "cure" of a genetic disorder if this "cure" could be done without destruction of other features or aspects intrinsic to the value of human life? If a fetus diagnosed by amniocentesis as having Down's Syndrome could be freed from this malady by genetic treatment of the fetus without other harm to fetus or mother, could there be any possible ethical objection? The word of caution is therefore appropriate because of the uncertainty of the path and its unanticipated consequences. But the attempt and the effort are surely worthy of our support.

The biological realm in which mankind exists has its own methods for positive eugenics, i.e., efforts to improve the race through control of reproduction: beauty may be only skin deep, but it's the main means available at the biological level to ensure that healthy individuals mate. With human recognition of the soulful and spiritual aspects of human beings, this "natural" method's effectiveness has also been decreased, but with an increase in the probability of individuals' mating with even more desirable human traits. If one were going to *improve* the race through controlling the genetic heritage of future individuals, just what genetic patterns would one seek? Are desirable character traits traceable to the genes and hence inheritable, or are they the consequence of particular experiential shaping of a genetic possibility? It is almost certain that we know far too little about the relationship between desirable human traits and their genetic basis, if any, to presume that we have the wisdom to determine what qualities are best for future generations and even less the ability to equate such qualities and genetic makeup. Any meddling that we are likely to do in the area of positive eugenics is so fraught with dangers to the human individual and to human freedom that we are well advised to stay clear of it.

Having eliminated the purely "natural" solution of the problem of genetic defects, the Christian is driven to provide some other kind of solution that will reflect the mission to reduce suffering.

Summary

Biological control of human life provides one more area in which Christians are driven to ask the question, "Should human beings play God?" The question is proper, but the implication that it is possible or desirable for Christians to forsake all activities that might be construed as "playing God" forgets the role assigned to us by our Creator to be His faithful stewards and to act on His behalf.

We cannot seek a simple guide to the ethically right in this area, as in any other, by invoking what is "natural" as the absolute standard. What is "natural" today is natural in a fallen world, and cannot be construed as having normative ethical authority. Likewise we cannot live in the world nor fulfil our obligations as God's stewards *and* maintain the strictly "natural"—for our presence and its activity necessarily changes the "natural." Our task is to be sensitive to the nature of that change and do everything within our powers to afford a net positive outcome for human beings before God.

A whole set of scenarios can be worked out involving new beginnings of life. Some of these present only minor ethical challenges (such as AIH and *in vitro* fertilization using wife's ovum, husband's sperm, and implantation in the wife), others are much more questionable (such as AID and the carrying of a child for one woman by another), while still others are without ethical support (experimentation on raising a fetus to childhood *in vitro* or by implantation in an experimental subject's womb). The status of a fertilized human ovum *in vitro* must be established; surely this field must be treated with great care, although no intrinsic objection seems valid against all medical experimentation with human blastocysts. This is a case where the anticipated good must clearly be demonstrated to avoid irresponsible research. There seems to be no justifiable reason to attempt to apply cloning techniques to human beings, although, if successful, there is no reason to believe that anything but a

fully authentic human being would be the result.

The challenges of genetic engineering reveal the ethical dilemma between rights of specific individuals and the overall good of human society. The driving motivation for cautious exploration is the realization that modern medicine inspired by Christian concerns has been so successful that the quality of the human gene pool is threatened with degradation; Christian concerns are rightly directed toward a response to this situation.

Underlying some of the misgivings about genetic engineering is the unstated assumption that human genetic material must be unique and somehow fundamentally different from other genetic material if it is to be truly human and the basis for defending the value of the human. A general fallacy is that if scientists show that the human genetic material is interchangeable with non-human genetic material, some serious damage will have been done to our appreciation for the unique value of human beings.[13] This is a particular kind of reverse reductionism in which the essence of humanness is sought in the biological parts that make up the human being rather than in the whole living system composed of these parts in the properly patterned interaction to manifest human life.[14] All human beings are indeed made up of the same kinds of atoms as other animals, sand, trees, rocks etc. It is not that such atoms or such molecules have latent in themselves the essence of humanness, but rather that humanness is an emergent property of the whole living system constructed in the appropriate way. Even if it is demonstrated that human genetic material is interchangeable with other genetic material, this would be no more destructive of a biblical view of the human being than the realization that carbon atoms found in trees are interchangeable with carbon atoms found in DNA. The fallacy described here arises when people forsake God as the basis for human uniqueness and value, and strive to find a basis in biology.

The challenges of genetic engineering reveal the ethical dilemma between rights of specific individuals and the overall good of human society.

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TOPICS FOR DISCUSSION

1. Is the beginning of human life something that should be "only in God's hands"?
2. Do men and women have an innate right to have childen regardless of the means? How about single parents?
3. Does artificial insemination differ in any substantial way from artificial inovulation? Does it matter critically whether a donor is used?
4. Does the development of "sperm banks" or "wombs for rent" pose severe ethical or moral implications?
5. To what extent is scientific research on fertilized human ova permissible in order to understand and guide disease control?
6. Is *human* procreation destroyed by laboratory fertilization procedures? What is the effect on marriage, the family, society, and the scientist?
7. Does the term "genetic engineering" disturb you? Why, or why not? Why do you think there is emotional public response to research like that on recombinant DNA?
8. When, in the course of development, does a living human acquire *protectable* humanity, i.e., as opposed to simply running it down the sink after experiments with fertilized human ova?
9. Can we ethically even get to know whether cloning human beings is possible?
10. Is individual dignity related to genetic uniqueness?

The Plastic World and the Bible

A hundred years ago Charles Darwin exploded a bomb that rocked the established institutions of science and religion, forcing them to rebuild on new foundations. In this century a similar discovery has been made, the impact of which is only gradually being felt by these same systems. It is likely that the reason for the relatively mild shock that this new idea is causing to religion is the modern readiness to accept scientific authority on its record of proven trustworthiness.

The issue in question is geology and the Bible; the new discovery is continental drift. Otherwise known as plate tectonics, the theory postulates movements of segments of the earth's crust on a scale far beyond that of localized tremors. Whole continents are in motion, rolling along like juggernauts on massive treadmills of magma (molten layers beneath the crust). As they crunch and grind over resisting masses of ocean floor, mankind feels the effects as his buildings and bridges collapse and his towns are obliterated by lava spurting up through the cracked surface.

The momentous discovery of continental drift came about as a part of the combined efforts of American and Russian scientists to map the ocean floor during the International Geophysical Year of 1957-58 (prolonged into 1959). It was noted that a ridge down the middle of the Atlantic exactly matched the contours of the adjacent land masses, and the conclusion was reached that the present Atlantic shorelines had once been joined along that ridge. Other investigations since that time have confirmed the theory with respect to the remaining continental areas.

Geologists are generally agreed that the great land masses of the earth were once joined into one huge supercontinent, designated as "Pangea"—meaning "All-Earth." Pangea was made up of "Laurasia" (North America joined to Eurasia) and "Gondwana" (the unified bulk of all the southern continents). About 200 million years ago, Pangea began to break apart like a giant jigsaw puzzle. This was during the age of dinosaurs, a time noted for its intense volcanic activity. The split-up of Pangea continues to the present day. It is estimated that South America is moving away from Africa at a rate equivalent to "the length of one's body in a lifetime."

Many startling and significant conclusions may be drawn from this new discovery.

- The terra firma concept is now definitely obsolete. Whereas the ancients believed in a stationary earth, it is now known that our planet exhibits all kinds of motion—rotational, orbital, and facial (surface plasticity).

- The rate of drift of the continents from their point of conjunction is strong evidence that the earth is very old.

- The Jordan River rift and the Red Sea were formed when Arabia was partially wrenched away from its connection with Africa. This accounted for the rugged and dramatic topography of the Holy Land—with extremes typified by the heights of Mount Hermon and the depths of the Dead Sea. This country continued throughout Bible history to display a violent geological temperament—as when Sodom was destroyed, the walls of Jericho shaken down, and the Jordan River blocked off. This region remains today a site of potential upheaval; hence, the prophets' ominous warnings that hills will fall and valleys be elevated and seas flee away as earthquakes continue to the end of time.

- The fabled "lost continent" of Atlantis never existed; there is no room to fit it into the jigsaw puzzle. An alternate and very satisfactory theory has been recently advanced to solve the identity of Atlantis: it was the civilization destroyed by the volcanic explosion of the island of Thera. This catastrophe obliterated the Minoan culture of Crete about 1380 B.C. and may have also accounted for some of the unusual phenomena of the Exodus.

- India was once a part of Africa, but it broke away and collided with Asia, thereby pushing up the Himalayas, the tallest mountains in the world. Africa also bumped into Eurasia and pushed up the Alps and Caucasian chains—which were barriers to the southward migrations of northern barbarians.

- The deep trenches of the ocean floor are now seen to be conjunctions of sections that are folding under ("subducting") in treadmill fashion. Korah and his fellow rebels were said to have been swallowed up alive "into Sheol" by falling into a ground fissure in the Sinai desert.

- Antarctica shared common boundaries with all the southern continents and once supported a common flora and fauna with the others. The presence of the fossils of one particular lizard-like dinosaur on India, Africa, and Antarctica demonstrates that the three were once joined.

On the vast scale of time it was but yesterday that Columbus shook the flat earth concept and that Magellan sailed around a new "global" earth. For most of their tenure on earth men have held with a world of "corners" and "pillars" and "vaults." They postulated a cosmic edifice erected by the divine Architect, "stablished" (having static stability) and founded on "cornerstones," a terra firma surmounted by a shell-like *firma*ment, a fixed structure immovable except by the hand of God (violent theophany) or the thrashings of the cosmic subterranean dragon Tehom-Leviathan. Earth was the middle stratum of a tri-level universe, and it served as the lid on the Abyss.

To the medieval world the earth was a flat disc floating on the cosmic ocean. Scholars were idealists, presenting to their students a flawless cosmology, created perfect by God. It was marred, to be sure, by the sin of Adam except in the still-pure heavens. Ecclesiastics were scandalized by the pock-marked face of the moon and the spots on the sun as seen through Galileo's telescope.

The Geological Record of Continental Drift

Years Ago, Millions	*Continental Movement*
450	N. Africa located at the South Pole. N. America located at the equator. They are 6000 miles apart but drifting together.
400	N. America impacts Africa causing the formation of the Appalachians.
330	Europe impacts Asia causing the formation of the Urals. For the next 130 million years all major continents are combined into the landmass designated as Pangea.
200	Pangea starts to break up.
130	North and South America separate from Africa.
90	North America separates from Europe.
70	Australia separates from Antarctica.
40	India impacts Asia causing the formation of the Himalayas.
4	Baja California separates from Mexico. Beginning of San Andreas fault.

The science of cartography was little known. Maps depicted an ideal world without any qualms that these charts did not accurately reflect the true layout of the land regions. Such maps remained in use until the eleventh century period of the Crusades and the age of exploration. At that time more accurate and realistic navigational aids were required.

At first glance there seem to be some passages in the Bible that provide confirmation of continental drift. These are the scriptural declarations that the islands will one day "flee" from the wrath of God (Rev. 6:14, 16:20). But these sayings are more likely expressions of a popular view that islands float upon the seas. Their "fleeing" would be a rapid drifting in this case, as though they were ships under sail, not just the gradual displacement connected with the spreading action of the ocean floor.

Nevertheless, the islands *are* in flight. After 50 million years California west of the San Andreas fault will have fragmented into an island located offshore of Canada and sliding along in a northwesterly direction. The Afar Triangle of East Africa will have broken off and blocked the entrance to the Red Sea, turning it into a great salt lake. Australia will have drifted northward to the equator. The Hawaiian Islands will be migrating westward and away from their present "hot spot" location, and in that place new volcanic islands will form. Thc global map will continue to reflect a ceaseless mobility.

Since this American continent is moving westward, concentration of greatest seismic activity will persist on its leading edge, the mis-named "Pacific" coast. . .That region will continue to be rugged, scarred with buckles and faults, undergoing upheavals and fractures. As to the trailing edge of our continent, its seismic activity will remain in the realm of the negligible. Its offshore reefs will continue to slowly fill in more land bulk. Florida and its environs will be slowly elevated by compressional uplift of the substrata over which our continent passes, and the Caribbean Sea will, therefore, dwindle in size.

Continental drift is the most amazing and exciting geological revelation of this century, and its implications are phenomenal. The principles of plate tectonics will continue to provide science, philosophy, and religion with new insights and applications, as, once more, perceptive men stand in awe at the wonders of God's creation.

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Why Christians Are Afraid Of Science

Many Christians are afraid of science. At the mention of the world "science," we may experience feelings of awe, of mystery, of mistrust, of anxiety. Natural science is a threat to many Christians, but social science is even more frightening.

Some of the dimensions of these fears warrant our exploration. Just why are we afraid? Are these legitimate fears? And can we do anything about them?

1. *The Fear of Power.* Perhaps the most obvious of our fears is the fear of power. The typical horror movie pictures the bespectacled, long-haired, white-coated mad scientist transforming assorted chemicals into some uncontrollable monstrous creature. And in the second feature film, we find an even more terrifying monster creeping out of some radioactive ooze to (almost) destroy the world. In the standard plot, the most ingenious and concerted human efforts fail to allay the destructive power of the monster; only the monster itself has the power to destroy the monster.

Most of us do not fear literal monsters. Yet the fear of figurative "monsters" haunts many of us. It seems that as science marches on, every important discovery brings some unwanted side effects. Radioactivity, cancer, and pollution are but three examples of these "monsters."

The power of science is not just the monster-fiction of the cinema. The mushroom cloud of the atomic bomb is a symbol of modern science and the potential elimination of nations—indeed of all mankind. Jacob Bronowski[1] has pointed out that there is a sense of doom overshadowing modern man, and this sense of doom arises from a fear of war. Science has enlarged and distorted war in at least three ways, according to Bronowski. They are as follows:

(1) "Science has obviously multiplied the power of the war makers." More people can be killed in a much shorter time and with an expanding variety of unpleasant techniques.

(2) Bronowski points to the wealth and surplus created among nations by the growth of science and technology. "This (surplus) is the greed of nations, and this also gives them the leisure to train and the means to arm for war."

(3) "It (science) has created war nerves and the war of nerves." Through modern communication media, we have immediate awareness of war, in our own homes. This awareness of war is not

the distant engagement of a nation's soldiers as in centuries past; its impact is much more forceful in each of our lives. We see actual destruction of human lives in our own living rooms, and we begin to accept it without alarm.

A spirit of war is part of international political mentality. Many a nation and group see war as one of the most important tools of diplomacy. The world is continually close to a dreaded war that may destroy a major portion of mankind in minutes.

The power of science goes beyond wars and monsters. Not only can science destroy, but it can also control. The scenarios of *1984* and *The Brave New World* are no longer remote possibilities. Today we face the threats of scientific control: genetic engineering, involuntary sterilization, behavior modification, subliminal seduction, mind-controlling drugs, reproduction by cloning, and test-tube babies. Not only do these raise serious ethical issues, but they also frighten the person who cherishes human freedom. Just who will be the controllers with all of this power? Will they be beneficent rulers? What will be their bases for control? The controlling power of science is recasting the nature of human society and raising difficult questions about human freedom.

The Christian is part of this society and he partakes of its culture. The Christian shares many of these fears and is influenced by the non-Christian's feelings of despair.

Some historians of science have characterized a historical flow from an early superstitious magic, then to religion, and finally to science. Presumably, as man has developed a greater intellectual sophistication, he has progressed to a purer and more reliable means of power. All we now need, so many tell us, is to redirect our wills and spend enough money, and we can solve any problem. On the one hand, man boasts that he has landed on the moon and split the atom. Yet, on the other hand, he fears this power, because he cannot completely control it. New wonder drugs bring unwanted side effects. The more we strive to control nature, the more it strikes back. People try to use the methods of modern science to solve the problems of society and persons, and yet somehow they are haunted by the suspicion that many of society's ills are products of a scientific world. The problems of society resist the methods of science.

2. *The Fear of Authority.* Christians are known for their commitment to the authoritative, inerrant, verbal inspiration of the Scriptures. We believe that the Bible is the Christian's reference point for absolute truth. Any system of thought that poses as an alternate source of truth, particularly when it presents an opposing claim on a common subject, raises certain threats to many Christians. Science presents such a claim to truth.

We live in a culture that elevates the authority of science to awesome heights of respect. "Science" sells toothpaste, shoes, margarine, and beer. Products are "scientifically" developed, tested, and proven. "Science" makes pronouncements about human behavior, about social norms, about political and economic systems. To a world that has come to trust in the absolute authority of science, it has become a religion.

Science has such powerful authority because of the scientific method. Like some fool-proof recipe, science produces results. Hypothesis, induction, experiment, deduction, and verification are the ingredients. The results are dependably repeatable and practical—how can truth claims of science ever be challenged?

Science and religion have waged war against each other through the centuries because they often do make conflicting truth claims. Such was the case with Galileo and the Church in the seventeenth century. Galileo's observations and reasonings convinced him of the validity of a sun-centered model of the universe. Such a model had been proposed decades earlier by Galileo's fellow churchman, Copernicus. With the telescope, Galileo was convinced that the planets, including earth, revolved about the sun. But the Church reacted very strongly to this. They pointed to Scripture verses to support their claim that the earth does not move. To the Church, man and earth had to be at the center of any Christian cosmology.

Thus there was a serious conflict of two authorities: the scientist Galileo and the Church theologians. The controversy was heated and bitter, with Galileo being pressured to publicly declare his views to be false, which he did. But history has shown Galileo to be the victor in that debate. Yes, even Christians today acknowledge that the earth moves, and they are not shaken in their faith in the inerrancy of Scriptures.

We face a similar conflict in the twentieth century. "Evolutionary" biology and geology present many claims to truth which appear diametrically opposed to a number of Christian teachings. Modern science teaches an age of billions of years for the earth; many Christians accept Ussher's age of six thousand years. Modern science claims that man and ape evolved from some common ancestor; Christians believe that man has been uniquely created in God's image. Science says that all is chance; Christians believe that the universe is filled with purpose. These are but few of the many, many contrasting claims.

The creation/evolution controversy began in the last century with the work of Darwin and his contemporaries. The controversy has never been satisfactorily resolved. Many Christian scientists and theologians are actively engaged in writing, debates, and political movements, with the intent of challenging the authority of evolutionary scientists. Much of this activity on the part of Christians is rooted in a deep fear—the fear of the authority of science to make truth claims that challenge the validity of our Christian belief system. For example, some creationist scientists contend that we will lose faith in the truth of God's Word if we accept an age for the universe which is much greater than a few thousand years. Unfortunately, much of this fear is transmitted to laymen, so that many Christians' reactions to evolution are based upon emotion and human authority, rather than upon reasoned analysis of the deficiencies of evolution as a theory.

3. *The Fear of Reason.* Many Christians fear science because they are afraid of the human mind. Science itself is one of the most striking illustrations of the creative ability of the human faculty of reason to produce significant changes in the world.

As humans, we tend to compartmentalize and categorize aspects of our experience. Thus it is that we hear many Christians speaking of their conversion experiences as one of "heart knowledge" as opposed to "head knowledge." The preacher warns us that reason is out to destroy faith, and we are exhorted to choose the latter at all costs. Philosophy and logic are sometimes pictured as secular tools of Satan, to be eschewed by the Christian. The Christian life then becomes a world of feeling, excitement, sentimentality, and emotional warmth. Skepticism, analysis, dialog, and intellect are objects of mistrust. Preaching and writing that stir emotions—the flash and the polish—are more popular than that which stretches the mind and departs from the traditional.

The fear of reason is not limited to the Christian as Christian. Historically, the reaction to the reason of the eighteenth century

Enlightenment was the emotion of nineteenth century Romanticism. At other times, the present being a sterling example, the practical skills have overshadowed the pursuit of a life of reason. Modern man is afraid of reason. Somehow, reason is mysterious and beyond the grasp of common man. Then too, the power and authority of science derive from reason, and so reason is the real threat. Reason produces specialists and eggheads, so we are told. So reason is to be feared.

4. *The Fear of the Secular.* The first three threats—power, authority, and reason—affect both Christian and non-Christian, although the fears produced may have different twists for the believer. However, there is one type of fear that is peculiar to the Christian. He is afraid of science because it is secular.

This fear is much broader than the fear of science. It is a fear of culture that is indisputably non-Christian and thus secular. The Christian who fears science because it is secular usually fears secular art, secular literature, secular psychology, secular sociology, secular economics, and secular philosophy. H. Richard Niebuhr has described five models which give ways that Christians have related their faith to culture, in his book, *Christ and Culture.*[2] Christians who have extreme fears of secular culture belong to the "Christ-Against-Culture" model. By totally rejecting secular culture, they become anti-intellectuals, and this is their defense against the threat of culture.

Such fears are based in a particular brand of Christian theology. This phenomenon probably derives from the asceticism of pietistic Christianity. Such theology holds that sin is so powerful that it makes the cultural efforts of fallen man totally useless and meaningless. Culture is seen as pursuing a declining history, with the art and philosophy of contemporary mankind being far inferior to that of past centuries. To be human is to be worthless. The sacred is good; the secular is bad. Modern culture, according to this view, is controlled by Satan, who deceives the scientific theorist, who confuses the data, and who uses culture to keep men from accepting Christ and the authority of Scriptures.

With such fears, the Christian's safety lies in his ability to withdraw from culture. He must insulate himself from such threats. He must keep his faith strong within a culture created by him and like-minded believers.

Conclusion: Some Words of Hope

We have painted a picture of gloom, doom, and despair. The Christian fears science because of its power and control, because of its authority as truth claimer, because of the mystique of reason, and because of its domination by non-Christians. If science does not kill us, it may dehumanize and de-Christianize life to the point that life becomes completely meaningless.

But there is hope. And the Christian, among all people, has the greatest hope of overcoming such bleak prospects for the future.

Faced with the destructive and controlling power of science, the Christian holds extremely powerful weapons of his own: the doctrines of the sovereignty of God and the image of God in human beings. This world has been created by God, for His purposes. Jesus Christ is Lord of history and sustainer of the world. His kingdom will come, and His will is being done. A power greater than any world power is at work in the Christian, and this power is an overcoming force. There is tremendous peace available to the Christian who trusts in the sovereignty of God.

Man is made in the image of God. Thus, my responsibility as a Christian image-bearer forbids my sitting and bemoaning the power of modern science and technology. Rather, I am called upon to use my God-given talents and skills to help channel the direction of such power. We need more Christians of moral integrity and ethical courage as leaders in modern science and government. Morality must not remain a private Christian matter; Christians must infect the modern marketplace of events and ideas with the human values taught by Jesus Christ.

Faced with the claims of science as an authoritative source of truth, the Christian can likewise take the offensive. Science as authority is a myth. Thomas Kuhn has given us some important insights into the nature of scientific "truth" in *The Structure of Scientific Revolutions.* Near the end of this book, he notes that he has used the word "truth" only once in previous chapters, and that only in a quotation from another author. His words strike a shocking blow to the authority of science: "Scientific progress is not quite what we had taken it to be...We may, to be more precise, have to relinguish the notion, explicit or implicity, that changes of paradigm (scientific models) carry scientists and those who learn from them closer and closer to the truth."[3]

The key concept here is that of interpretation. In science, all data is theory-laden. In other words, facts do not speak for themselves. There are subjective, interpretative elements that control science much more than many a scientist will admit, and much more than the layman is aware. Theories change, because interpretations of data change, in a world of changing concepts.

Likewise, theology has its interpretative aspects. As Christians, we must humbly acknowledge that there is a difference between the absolute truth of the Scriptures and our understanding of the Scriptures. In fact, the Church finally admitted this in the case of Galileo.

Thus, the current warfare between creationists and evolutionists takes on a different perspective. Christians will not disprove evolution by research and data gathering alone. Facts are not enough. The battle is being waged on the wrong front. Rather than challenging the correctness of facts, the reliability of methods, and even the logic of arguments, the anti-evolutionist must challenge the very conceptual foundations of evolution: its major theses and its important unspoken presuppositions. Here is where the Christian church is in need of scientists and philosophers of science who are ready to grapple with such broad, over-arching issues.

Faced with the challenges of reason, the Christian again has hope. To begin with, we need to acknowledge that the Scriptures are filled with appeals to reason. Man has been created by God as a reasoning begin, and reason is important both in our life of faith and our life of secular thought.

In his excellent little book, *Your Mind Matters,* John R. W. Stott argues that God expects us to use our minds in Christian worship, Christian faith, Christian holiness, Christian guidance, Christian evangelism and Christian ministry. Stott claims that man's rationality is basic to Christian doctrine because: "God has constituted us thinking beings; he has treated us as such by communicating to us in words; he has renewed us in Christ and given us the mind of Christ; and he will hold us responsible for the knowledge we have."[4] Stott calls Christian anti-intellectualism a form of worldliness.

But we must go even further. We must refuse to accept the dichotomy that contrasts head and heart. We must accept Scripture's view that human beings have been created as holistic, inte-

grated beings, with the aspects of body, soul, and spirit intermingling and interacting. A human person is not simply "composed of" three detachable parts that are in isolation, but is a unity.

Thus, I can bring reason to my life of worship, and not be afraid. Likewise I can bring faith and emotion to the laboratory and not be ashamed. In whatever I do, I am a human being, I am a unity, and I must reject false dichotomies and compartmentalizations.

Finally, the Christian need not fear the secular. Niebuhr provides alternatives to the "Christ-Against-Culture" approach.[2] The Bible does not force us to reject culture. On the contrary, all people have been created in the image of God. All mankind has been given the cultural mandate and the responsibility over creation, as declared in Genesis. Although mankind has fallen, the effect has not been to nullify culture, but to mar it, to keep it from becoming just what it might become. Unsaved people create beautiful paintings, write insightful novels, develop sound philosophical arguments, and, in reference to our subject, produce acceptable experiments and theories.

Thus, the Christian need not set out to destroy contemporary science. Nor need he develop his own private, Christian science. A better approach, and I believe that it is the biblical approach,is to become involved in modern science, to become part of its transformation.

In fact, this might well be the central theme of this paper. The Christian church and its people must learn to act rather than react. Our churches and our Christian schools and colleges must develop leaders in the world, instead of just followers in the Church.

These four Christian responses to four threats of modern science sound quite simple, but they are by no means simplistic solutions. If we accept the challenge to overcome, we can expect hard work, disappointment, false starts, discouragement, and misunderstanding. There are no formulas, no slogans, no mantras, no easy ways to destroy our fears.

As Christians, we must accept God's challenge to have dominion over *all* the earth. And we need not be afraid.

[1]Bronowski, Jacob J; *The Common Sense of Science;* Random House, 1959.

[2]Niebuhr, H. Richard; *Christ and Culture;* Harper & Row, 1951.

[3]Kuhn, Thomas S.; *The Structure of Scientific Revolutions;* University of Chicago Press, 1962.

[4]Stott, John R. W.; *Your Mind Matters;* Intervarsity Press, 1972.

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This is a previously unpublished paper by Dr. Watts (1941-1980).

The Church, Education and Third World Development

The Third World is the world of underdeveloped and developing nations. As one insightful African noted, the preferred term once was "underdeveloped" but now the more positive "developing" is used (Yoloye, 1980, p.vii). Both of these terms were originally used by Westerners to describe how far up the technological/industrial ladder non-Western nations have climbed. One might argue about the appropriateness of judging other cultures by one's own standard. In doing so one assumes at least tacitly if not overtly that his own culture is the superior one. At best this leads to paternalism towards the people of the culture in question. Consider the remarks of Lord Lugard, former Governor-General of colonial Nigeria (1965, p.70),

> "In brief, the virtues and the defects of this race-type are those of attractive children, whose confidence when once it has been won is given ungrudgingly as to an older and wiser superior, without question and without envy. Valiant, clever, and lovable, they bear no malice and nurse no grievance."

Although many years have passed since Lugard left Nigeria his sentiments still remain. It is not uncommon for Westerners working in Africa today to feel that their hosts are like children playing at an adult's game. This is hardly the stuff of communication and understanding among people. Nevertheless with respect to development the Third World nations have generally accepted the Western technological standard and indeed cast acquisitive glances at the West's technological cornucopia.

There are many ways in which the Third World nations pursue development, not the least of which is to buy it when the money is available. Nations with petrodollar wealth like Saudi Arabia or Nigeria are good examples. But wealth is not the quickest, most accepted key to and quarantee of development. Education is. For Nigeria,

> "The philosophy is that education is recognised as the greatest force that can be used to foster the much needed unity of Nigeria and to correct the imbalance in inter-State and intra-State development. Education is also the greatest investment that can make for the quick development of the economic, political, sociological and human resources of the country. The Government therefore will provide equal educational opportunities for all the citizens." (Taiwo, 1980, p. 188).

Not all areas of education are treated or valued equally. There is little emphasis on liberal arts education although the African arts for instance are indeed very rich (e.g. see Larson, 1980, pp.81-92 and Hughes, 1982, pp.50-1). This is partially a reaction to colonial education which nationalists judged to be of too little practical value and in response to a very pressing development need. Professor Baikie, Vice-Chancellor of the University of Benin states (1981).

> "[Africa] must also be ready to develop the necessary managerial, technical, and scientific talent to be used for development. Technology...and Science...are necessary preconditions for development. Africa is very far behind in developing its technology and Science."

The growth and use of technology has no foreseeable limit (i.e. other than Armageddon), so there is an imperative that there be an equal and parallel growth in the numbers of scientifically literate laymen (Zoller and Watson, 1974, p.108). The theme then of the Third World is, "education for development." More specifically it is, "science education for technological development."

An emphasis on science education is one thing. Very often there is an over and unqualified emphasis, born of impatience, placed on a science education deemed necessary for technological development over a seemingly less useful but culturally acceptable liberal arts oriented education. In Nigeria the national policy is governed by this point of view. Professor Fafunwa, Nigeria's pre-eminent educator, has written (1977, p.70),

> "The teaching of physics, chemistry and biology, or a composite of them, called general science, should be a compulsory subject or subjects for all secondary school pupils, just as language and literature are today. In the world today, science and technology, we repeat, have become a dominant cultural factor and any nation that is not alive to this fact is either dead or dying."

One would hope that there would be theologians, artists and other humanitarians willing to contest science and technology's ascendance to the position of "dominant cultural factor."

What are the results of such policies? First one must consider what these nations are like that are struggling to develop. Many African nations are only about twenty years old, having gained their modern independence in the late fifties and early sixties. They are rural, agrarian societies in the main; the typical African farmer works with a hoe. The plough is a Middle Ages technological improvement that never reached sub-Saharan Africa. Neither did the wheel. While camels and donkeys are used to move farm products, seldomly does one see a cart employed. The English sociologist J. Goody has observed that (1980, p.75),

> "In Africa the small scale technology of [Middle Ages] Eurasia is lacking; at the village level...there were wood-carvers but few carpenters, iron-workers but no mechanics, potters but no wheels or kilns. The basic craftsmen have often to be trained."

Julius Nyerere of Tanzania says of his own people, "We are not ready for the tractor, either financially or technically; but we are ready for the oxen-plough..." (1967, p.4). It is into these societies that is being transplanted the science, technology, and education of the 20th century West.

It has been said that whether developing nations take the capitalist or socialist economic path they need as well to develop a corresponding capitalistic or socialistic culture as support (Baikie, 1981). The same can be said with respect to science and technology. If this is to be a component of development then there also needs to be a concurrent development of a cultural foundation that minimizes the disruptive side-effects of technological development. One could argue that in Western civilization the deepest roots of science and technology are as old as that civilization. Hooykaas (1972) and Klaaren (1977) have written convincingly of the Judeo-Christian roots of modern science and technology. The meaning is that for generation after generation science has had an influence on Western peoples. Over the decades, especially over the last 20 years, that influence has grown and now the societies of those peoples are said to be industrialized and technoligical (this is not to admit that this progress has become the dominant cultural factor). The benefits of such societies are obvious to the people. If the problems are less obvious then there are prophets from Jacques Ellul to Ralph Nader to warn them.

The point is that Westerners today because of their culture have grown up to be a technologically oriented people. Their culture accommodates and therefore minimizes the disruptive effects of science and technology. On the other hand, in the developing world one is disturbed to see that to date most development continues to be balanced precariously atop a non-technological cultural foundation. Seldom is time allowed for true and necessary integration. The policies of development often hasten an unfortunate revolution rather than an evolution to transform societies from the 18th century to the 20th century, and the resulting cultural and sociological disruption is no surprise.

These educational policies are not without success. Scientific communities have been established and are being sustained by young scientists coming up through the school systems (e.g. Chitnes, 1980). Colonial founded universities such as Nairobi and Ibadan have made progress towards indigenization. They have developed truly African features (Eisemen, 1979, p.80). The people involved in these communities of course are only a small percentage of their nation's populace. Furthermore it is an elite percentage that often has become quite removed from the cultural mainstream of its nation. That a professor at a university has learned to accommodate educational and technological progress is no indication that his rural countrymen have. It is often the case that this elite, having tasted the heady wine of development, pushes even harder for more and faster development. They become a source of disruption rather than a catalyst for cultural integration.

Untempered policies for the promotion of science, technology, and education can also result in an unfounded hope amongst people; that is, the hope that the cures for all the ills of the human condition are coming within reach. Problems with known solutions are taken care of through popular education. Science provides the needed knowledge for the yet unsolved problems and technology applies that new knowledge. Certainly the hope for a better life via development is reasonable and justified. To be literate is unarguably better than to be illiterate. There are however many problems that education does not solve. Mass education has not emptied American prisons as the educator Horace Mann once predicted it would. There are also many problems that have proved to be intractable to date to the efforts of science. Furthermore and of more immediate importance, technological solutions are not without adverse effects. Nature has a grim way of extracting her ounce of flesh for encroachment against her (e.g. the ecological disasters of the West). One admits to the difficulty and political unpopularity of warning people who live in a parched and arid land that there are adverse consequences of large scale water control and irrigation schemes. When one's people are illiterate, modern mass education does seem a flawless necessity. Environmentalism and conservationism do seem like luxuries for the wealthy. Nevertheless quick, short-term solutions are often the seeds of long-term difficulties.

The developing nations are helped by more advanced nations who give aid and assistance and who do business with them. Parts of Africa have taken on a cosmopolitan hue because of the many expatriate advisors, teachers, technicians, and businessmen present. These Westerners (including those who have been westernized) are often unwitting compounders of Third World problems. Because of their technological background the tendency is to define their own problems technologically and to apply technological solutions. Westerners looking at the developing world do the same with frequent unfortunate consequences. To the experts, for instance, population is a problem called "over-population" (Ehrlich, 1968) and hence projects like the Kharma Study (Wyon and Gordon, 1971) in India funded by the Indian government and the Rockefeller Foundation. The failure of that project to curb population growth has been elucidated by Mahmood Mamdani (1972) who cogently argues that population is a problem to the western experts (and westernized Indians) but not to the Punjabi subjects of the Kharma study. To them large families are not only desirable but necessary for survival. There is quite a difference be-

tween perceived needs and felt needs. Outsiders perceived a need to slow down population growth that they saw as damaging to the Punjabis' economic condition. The Punjabis feel a need to survive and to improve their economic lot. Children, especially sons, insure that the need is met. It may well be that the real problem is or eventually will be over-population, but the approach and subsequent dismal failure of the Kharma Study has made the issues more difficult than ever to deal with.

Westerners furthermore tend to believe that both their science and their technology are acultural and fit in equally well almost anywhere. Scientists and laymen have of late grappled with the moral and ethical dimensions of science, rejecting notions of moral neutrality. Cultural issues need as well to be dealt with, for there seems to be little cultural self-awareness and even less awareness of cross-cultural comparisons. The case of Iran is an instructive one. The late Shah with American encouragement accepted a position of cultural neutralism with respect to many aspects of development. The Iranian islamic fundamentalists did not. The Ayatollah and his followers are men of the Islamic cultural zenith, the medieval period of 700 AD to 1100 AD. Of this period Von Grunebaum (1946) has written,

> "But while Islam for many a century continued liberal in accepting information, techniques, objects, and customs from all quarters, it was careful to eliminate or neutralise any element endangering its religious foundation, and it endeavoured consistently to obscure the foreign character of important borrowings and to reject what could not be thus adjusted to its syle of thinking and feeling" (p.32).

One might conclude then that the fast pace of development under the Shah did not allow for the syncretization that would "obscure the foreign character of important borrowings." Resistance to change and out-right rejection occurred, which, coupled with the many other failings of the Pavlavi regime, resulted in revolution. A person is left wondering if the same fate does not await leaders of other nations undergoing rapid developmental change.

None of the foregoing is staging for a chastising-the-West conclusion. Western nations are already subjected to quite a bit of that sort of thing in spite of the fact that the chastising "have-nots" aspire themselves to be "haves." America is often singled out as the chief example of a technological, industrialized society and so it should be. The genuine richness of American life is not illusory. The alleviation of poverty and sickness coupled with civil liberty is an achievement worthy of imitation. While one would hope that America will be a partner in development with other nations, as President Reagan expressed at Cancun (Stesser, et. al. 1981 pp. 30-6), it must be remembered that the United States has many problems of its own not curable by it's well established education, science, and technology triumvirate. There are problems that are very much the consequences of the nation's progress in development (e.g., in medicine new ethical problems have arisen with the rise of various life-sustaining machines). People of the West and especially Christians are aware that these things are so. That awareness needs to be shared with the developing world. A partnership in development then does not mean the uncritical transfer of Western ideas and machines from big brother to little brother.

The Christian contribution to development has already been significant. As happens at home the Gospel accepted brings an increase in morality and integrity. In those lands said to be underdeveloped according to the technological scale much more happens, Gospel accepted or not. The preaching of the Gospel is the priority of Christian missions, but the centrality of the Scriptures in Christian faith and the love of God lead missionaries into two additional tasks. Missions develop schools so that people can learn to read the Scriptures and they do various sorts of relief work to combat human suffering. Historically these efforts have had a direct influence on development. They have had far reaching albeit unintentional consequences. Speaking about Nigeria, Ozigi and Ocho (1981, p.37) say,

> "One of the greatest legacies of the missions was their educational work. Though the major objectives of the missions in establishing their schools were the expansion of their religious activities and the spiritual edification of their adherents, education produced partly unintended results. The struggle for Nigerian independence was waged by people literate in Western education".

The Zambian leader Kenneth Kaunda was the son of the first African missionary of the Livingstonia Mission of Nyasaland. Kaunda says of himself (1962, p.146),

> "...I was brought up in a Christian home and my Christian belief is part of me now. It is still my habit to turn to God in prayer asking for His guidance. I do not think I have ever seriously doubted the truth of the Gospel..."

Dr. Nnamdi Azikiwe is another case in point. He received his education in mission schools and claims that the precepts of Christianity have guided him in his public life. Today he is known as the father of modern Nigerian nationalism, the chief architect of Nigeria's independence (Ojiako, 1980). In sum, the early missionaries came and "...planted churches, opened hospitals, and established schools, thereby setting Africa on the path to modernization" (Kane, 1981, p.62). What is seen today in nations like Nigeria is the partial responsibility of the Church.

The times have changed however, since the early mission days. The Church no longer has the direct influence on development it once had through the mission schools and hospitals. Schools and hospitals are now largely run by national governments. There has been a change in emphasis as well. The missionaries were interested in the evangelization of people, not so much in development. Things like educations were thus a method to an end. The national development plans of today embody education, science, and technology but without the gospel. Herein are two reasons for the continued involvement of Christians in the process of development. First, the work of the Church started the process of development, however unintentionally, and therefore should not now abandon it. Second, the missionaries had the right idea about education, science, and technology all along. They are things to help people but are not the most essential.

Christians are called to be salt and light in the world. As such one would like to see African Christians, expatriate Christians, and missionaries, especially all those who are teachers, exert a moderating influence on development and growth. The Evangelical Church of West Africa (ECWA) can be sited as an exemplary church in action. ECWA operates a rural development programme for farmers under which agents are sent to visit villages bringing agricultural information immediately useful to the village farmers. In Nigeria this is quite the opposite of the government's Green Revolution programme which is aimed at large scale, mechanized farming. ECWA also supports the concept of relevant technology. A recent article in the ECWA publication "Today's Challenge" (1981, p. 16) begins,

> "In a society where things are not made with the need and yearnings of the people in mind, the name 'Relevant Technology' no doubt rings a bell. This all the more so because all countries, especially those of the Third World, require and should work towards the production of materials, goods and equipment that not only satisfy but are also relevant to the needs of the people. This should be the goal of our engineers and industrialists, But rather unfortunately, it has not been!"

The article goes on to describe the work of the Institute of Relevant Technology in Plateau State, Nigeria, which trains people to become employable or self-employed in businesses making locally needed products. These products include such things as tricycles for the lame and cassava grinding machines affordable by villagers. This work of ECWA might be called development from the ground up, which can serve as a balance to the often top-down development schemes of government. The work is slow-growth work which brings about the more gradual cultural change that minimizes social disruptions while maximizing technological effectiveness.

In their role as salt and light there is one more job for Christians. This is the job of influencing the attitude people and government take towards education, science, and technology. The early missionaries were right in thinking that these material things can be helpful but are certainly not a panacea for all problems. An unqualified emphasis on them results in a form of idolatry. Idolatry always fails the believer, whether an individual or a nation. As nations struggle to develop, the Church's role in development has become that of prophet.

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Integration Efforts of Some Christian Psychology Faculty

The desire to integrate faith and academic discipline is one of the most unique and prominent features of evangelical Christian college faculty. The growing involvement among Christian psychologists in the integration of psychology and theology is manifested by a tremendous growth in the number of publications in this area over the last ten years. This is exciting, but it is a troublesome excitement. For one thing, there seems to be very little consensus on *what* and *how* to integrate. Recent evaluations of and reflections on the "state of the art" readily confirm this feeling (cf. Farnsworth, 1980; Koteskey, 1980; Larzelere, 1980; and Collins, 1980). An emerging problem, the proliferation of integration terms, may seem rather superficial, but it does create confusion. Examples: "models" of integration—"territorialism" (Even, 1977), "certainty" (Farnsworth, 1978), "privatization" (Burwell, 1979), "against" and "isolation" (Carter and Narramore, 1979), and "exclusivity" (Rambo, 1980). These all seem to describe a mode of denial of the possibility or necessity of integration. The lack of consensus on what and how to integrate may produce a sort of creative anxiety among Christian psychologists. But the proliferation of terms can reduce the effectiveness of communication. In spite of these growing pains, however, the level of integration activity does reflect both the excitement and vigor of this unique evangelical enterprise.

The purpose of this paper is to report on a type of integration involvement among evangelical Christian college psychology faculty. Clement and Warren (1973) identify four types of integration activities: conceptual-theoretical integration, integration through research, integration through professional practice, and intrapersonal integration. They treat these four types of activities as disjointed categories. Each is significant in its own right. A Christian psychologist, by implication, may concentrate on and become expert in one type of activity without touching the others. For a Christian psychology professor, however, it may be more productive to view these four types of activities as the integral parts of a whole and balanced professional lifestyle. Therefore, for example, to be a Christian psychologist is more than just a Christian in psychology who manifests certain personal characteristics while doing psychology (professional integration?) or practices certain psychological insights he teaches in his/her Christian walk (intra-personal integration?). A Christian psychology professor really cannot practice personal and professional integration satisfactorily without making contributions to this discipline from a uniquely Christian perspective through research and publication. On the other hand, conceptual-theoretical integration could be the most foundational activity of all. Commenting on the list by Clement and Warren, Mathisen (1980) contends that conceptual-theoretical integration is "essential to the other three...We cannot adequately proceed to the other challenges of integration until we have a firm theoretical basis on which to base our future efforts" (p. 222). This important issue deserves further discussion but is beyond the scope of this report. The present report deals only with the research activity of the faculty seen through their publications.

In January, 1982, a letter was sent to all 63 institutions listed in a membership brochure of the Christian College Coalition. The letter was addressed to the chair of the psychology department, requesting lists of publications of every teaching member in the department. The purpose of the request (gathering material for the March psychology faculty conference sponsored by the CCC) was indicated in the letter. Twenty-three departments responded with lists of publications. A total of 46 psychology faculty members from these 23 colleges were included in this report. They represented 28.22% of a total of 163 psychology professors in the CCC schools.

Not every responding department sent lists covering its total faculty. For example, there was one response out of five members from one school and seven out of thirteen from another. Eleven other departments responded with either letters or phone calls indicating that they could not provide such a list.

Within the time limitation and the limited objective of getting a "feel" for the faculty involvement, this report deals only with those articles published in the refereed professional journals. Articles published for the general public in such magazines as *Christianity Today, Eternity,* or *His* were excluded. Books and chapters in books were not included. Books reviews were not included. Articles-in-press were not included. Papers presented before professional associates were not included.

The selected articles were then divided into two broad categories: those published when one was associated with a non-Christian institution and those published while a faculty of a Christian college. This was determined by examining the author affiliation listed in an article. When a journal was not readily available, a request for a reprint was sent to the author. In every case the request was promptly honored. In the case where an author's current Christian college affiliation was mentioned in a footnote because the change of affiliation took place after the research was completed, the non-Christian institutional affiliation was recorded.

The Table shows seven subject areas into which the articles were grouped. These were conventional subject areas in psychology except for "integration-research" and "integration-theory". Any empirical article that dealt with religious behavior or was related to

a theologically-derived concept was assigned to the "integration-research" category. Any non-empirical article of psychotheological nature was put in the "integration-theory" category.

A total of 167 articles were published by the 46 faculty members in 23 Coalition colleges. These Christian psychology professors published 122 articles when they were affiliated with non-Christian institutions and 45 articles when they were associated with Christian colleges. The number of publications by individual faculty members ranged from one to sixteen and the mean number of articles published by the group was 3.63. The Table presents the numbers of published articles according to subject matters and affiliations.

A major weakness of this study is the problem of representativeness of the sample. The sample is obviously biased toward those who had at least one article published. Ellison (1973) reported a study of Christian college psychology faculty based on 69 subjects. Over half (54.5%) indicated that they had not published any journal articles. The mean number of articles published by the Ellison group was 1.3, compared with the American Psychological Association estimate of 1.0, and 3.63 in the present study. The sample bias here is quite obvious. In spite of this weakness, one can still get a "feel" for the kind of involvement of our faculty by this limited examination of publication trends and content.

The marked reduction in number of publications by faculty during Christian college affiliation may not necessarily alarm us when we consider the relative youth of some members and the recency of this affiliation of several others. For example, one professor who had just joined a Christian college faculty had 8 perception articles published under her name while affiliated with a non-Christian institution. In another case, a new Ph.D is credited with 5 articles in social-personality under a non-Christian institution affiliation. These recent transfers might continue their productivity given more time with their new affiliation. But a dramatic change in publication productivity is reflected in one case where a professor published 16 scientific articles before he joined a Christian college. And then he published none except 3 in the "integration-theory" area.

It may be reasonable to expect some reduction in productivity of professional journal articles by Christian college psychologists. Increased emphasis on teaching and teaching load, more demand for writing for Christian and denominational magazines, and the lack of research facility and incentive, all should contribute to a decline of scientific publications in the general area of psychology. However, an increase of productivity of Christian college faculty in the integration area should be expected.

The twenty integration articles published by Christian college psychologists (see the Table) do not reflect all of their involvement. More than two-thirds of the respondents list book reviews, articles in general and denominational magazines, and papers presented at conferences of the Christian Association for Psychological Studies and the American Scientific Affiliation that deal with integration. The numbers of such papers range from one to fifty-six. Therefore, any future study of faculty integration efforts will do well to examine these works.

Most "integration-research" articles are "correlational" (Carter and Narramore, 1979) in nature. There is little interaction between empirical research and integration theorizing. Typically, a research integrationist adopts a popular psychological construct (e.g. purpose in life or locus of control) and applies it to a Christian population. The results are informative and interesting but of minimal theoretical significance. The theoretical integrationalist seems to have a completely different agenda. He talks about the inadequacy of certain integration models or styles. He is in search for some comprehensive and all-encompassing paradigms. His tone is always philosophical, usually somewhat mystical, but very seldom behavioral.

Let me make some comments here that go beyond the data of the present report but apply to our general integration efforts seen through the pages of several important evangelical journals (i.e. *Journal of Psychology and Theology, The Bulletin of CAPS* and *the Journal of the American Scientific Affiliation).* It is the Christian clinician whose activities make him/her sensitive to the implications of theory, therapy and theology (Timpe, 1980). Surprisingly, no empirical research has been conducted to test a uniquely "Christian" therapeutic technique that is derived from a theologically informed theory. Carter and Narramore (1979) recognize that, at the present time, there is no general theory of behavior in Christian psychology. Nor do we have a definitive theory of personality or even pathology. I suspect that this is a most fundamental problem in the integration enterprise. We have a desperate need for theories that are explicitly informed by theology but adaptable to empirical testing. Precious insights gained from some theologically derived concepts on the nature of man may be biblically correct and philosophically coherent. But their psychological "legitimacy" tends to be suspect. I venture that there is a good chance that our efforts will be viewed not only as "unscientific" but also as "nonpsychological."

We ought to make serious attempts to establish empirically derivable theories and to conduct theoretically oriented research and then take the additional step to reciprocally interact with our clinical practitioners. Unless we expand our efforts in these direc-

Articles Published by Christian College Psychology Faculty According to Subject Areas and Affiliation (N = 46)

Subject areas	*Non-Christian College Affiliation*	*Christian College Affiliation*
Social/personality	39	7
Learning/perception	24	4
Developmental/educational	24	5
Clinical/counseling	10	4
Physiological	8	2
Integration-theory	14	15
Integration-research	3	8
Total	122	45

tions, our attempts at integration purely on the theoretical level will be of limited value. Much of what is done is of value for apologetics, for devotions, or for affirmation. Now let us determine to direct more of our integrative efforts as Christians to the more complete development of psychology as a discipline.

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Behavioral Psychology in the Sunday School Classroom

For a number of years behavioral psychology has been an important influence upon teaching in many public school classrooms. Educators have made use primarily of operant conditioning procedures in applying behavioral theory. Examples include reinforcement systems as motivation for academic achievement (such as token economies), the use of behavioral objectives, curriculum design based upon task analysis and programmed lessons, and—perhaps the most common application—discipline procedures.

More recently, serious objections have been raised to some of these interventions. Token economics, for example, have been criticized for their temporary effect on motivation; when the tokens no longer exist (such as when a class is promoted), teachers complain that students' motivation to achieve declines and complaints about the lack of reinforcers surface from students. Perhaps even more crucial, some research suggests that external reinforcement can counteract intrinsic interest in a task (Greene and Lepper, 1974). Of course, strict behaviorists point out flaws in many educational designs that fail. In spite of some implementation problems, there are still many teachers who feel *some* behavioral interventions, carefully applied, can be an asset to teaching—particularly in discipline management.

The question might well be raised, can or even should such interventions be used in the Sunday school classroom? While some have objected to the behavioristic philosophy behind behavioral interventions, others have stated that Christians can make use of behavioral techniques without adopting the philosophy (Bolin and Goldberg, 1979).

Learning objectives have probably received the most attention from Christian educators (Heck and Shelley, 1979 are but one of many examples that could be cited). Dobson (1970) suggested a decade ago that behavioral discipline could help Sunday schools, as has Beechick (1981), though the latter is strongly against other behavioral influences upon church education. Rodger Bufford (1981) not only prescribes behavioral techniques for instructional technology and concept learning in church, but even gives a biblical basis for doing so.

In this paper, behavioral objectives, church related skills, and emotions related to Sunday school are considered as important contributions behavioral psychology can make to church education. The role of discipline in the church has been discussed previously (See Ratcliff, in press).

Behavioral Objectives

Objectives have received increasing attention from Christian educators, with several Sunday school publishers including objectives in their literature. The importance of adequately defined goals has thus been underscored.

Too often teachers are unsure of their goals in church education: "growing in Christ" or "receiving a blessing" are obscure and nearly impossible to evaluate. Objectives are more definitive of desired outcomes, thereby becoming the focus of instruction. As the Scripture states, "It is not good to have zeal without knowledge, nor to be hasty and miss the way" (Prov. 19:2, NIV). By carefully stating objectives of teaching, the desired results are more likely to result.

An objective requires at least three elements (Mager, 1961): a terminal behavior that is observable or measurable, the conditions under which the behavior occurs, and the criteria for the level of acceptable behavior. These characteristics lend themselves to a behavioral interpretation of one's goals for a class, although it is conceivable that these could also describe cognitive or affective outcomes also. A complete objective, in other words, tells precisely *what* is to occur, *when* and *where* it will occur, and finally *how much, how often,* or to *what extent* it will occur.

Writing such objectives is a time-consuming and difficult process. Indeed, a survey of church publishers who include objectives reveals that few meet all three characteristics. Yet without such precision, ambiguity is likely and it is possible that even a well-meaning teacher will achieve little in the Sunday School hour. Writers such as Engel (1977) have come to realize that objectives are an integral part of *every* area of ministry in the church. Using objectives, spiritual progress is less likely to be an accident rather than a planned outcome of instruction.

Some Christian educators (e.g. Beechick, 1981, and Kauffmann, 1977) have objected to the widespread use of behavioral objectives in Sunday school. It is suggested that the most important goals of

church are spiritual, hence not always behaviorally definable. The radical empiricism of behaviorism, it is claimed, ignores the more important but less tangible spiritual development of the individual.

It may be that some of the criticism of objectives is due to differing interpretations of what "behavior" means. Most concede that there should be some means of measuring most of the outcomes of Sunday School, yet behavior is sometimes suggestive of prescribed actions that will result. Attitudes and "internalized tendencies" (Wolterstorff, 1980) learned in Sunday School may not allow for precise predictions in terms of daily applications.

Technically, the behavior most teachers prefer to see in teaching attitudes and "internalized tendencies" is actually verbal behavior in class, with applications being variable to the individual's own lifestyle. Evaluation then consists of restating these verbalizations, as well as giving potential applications in one's own life. In other words, the student is expected to generalize a concept that will have a number of possible applications.

In such cases, the verbalizing of concepts and applications are the most immediate concern for the teacher. Self-report of applications in life may also be given time in class, although self-reports are notoriously skewed toward expectations rather than accuracy. Thus, the measurement of cognitive, affective, and even spiritual objectives is likely to be verbal behavior, but verbal behavior lends itself to precise measurement.

For example, the story of Joseph and his brothers could produce objectives related to retelling the story, abstracting principles, and finally individualized applications in the student's life. The first two are behaviorally definable in advance, while the third is less predictable in a behavioral manner. All three are worthy goals for a class, but the focus is necessarily upon the first two since they can be immediately evaluated.

The average Sunday school teacher may not be greatly concerned with measuring verbal behavior precisely, but the point of behavioral objectives is that unless *some* means of measurement is used, no one can be sure that anything is accomplished. The measurement need not be precise to be helpful—even questions asked by the instructor at the end of class is better than no assessment at all. Objectives lend themselves to such measurement. Planning that includes objectives is a responsible means of achieving desired goals in Christian education.

Church-Related Skills

In contrast to verbal behaviors, skill learning is a bit closer to observable actions mentioned previously. Behavioral objectives are particularly helpful in teaching skills (Beechick, 1980). Skill learning may take only a limited amount of class time in any given quarter, but it is an important outcome that can be profitably taught in church.

For example, locating books of the Bible and the use of Bible study aids (e.g. concordances, Bible encyclopedias, Greek lexicons) are skills that can be taught in class, but are usually learned accidentally, if learned at all (Heck & Shelley, 1979).

Other skills may at least in part be behaviorally defined and taught as a part of church education. For children, this includes aspects of the worship service or fellowship meeting, such as taking turns in sharing, non-interruption, note-taking, and responsive reading. Adults are more likely to learn Bible study methods, evangelism procedures (see Ratcliff, 1978), and self-modification in small groups. These skills are an important part of living out one's faith, but are too often neglected in church training.

Management of contingencies is inherent in a behaviorally based education. Behavior modification has been criticized for its extensive reliance upon external reinforcement. While mislabeling reinforcement as "bribery" is obviously a misnomer (Bufford, 1981), the dependence upon extrinsic contingencies is a matter of concern. Behaviorism has often received a bad press due to excessive dependence upon candy bars and suckers.

Ideally, intrinsic reinforcement is preferred to extrinsic reinforcement. However, few children are sufficiently motivated intrinsically to the point that all external contingencies can be overlooked. Ignoring contingencies does not result in their ceasing to exist. However, non-material reinforcers such as privileges should be explored for potential use by the classroom teacher, while aversive contingencies should be minimized. Once implemented, extrinsic reinforcement should be systematically eliminated through an intermittent schedule of reinforcement, a procedure often overlooked by novice behavior modifiers, contributing to the reverting to former behavior when contingencies are suddenly removed (as at promotion to a new class).

Behavioral influences pervade every classroom, wanted or not, Christian or not. Contingencies such as praise, scolding, and ignoring are unavoidable in any social context, as are other covert reinforcers. The goal of Christian educators should be to use these behavioral contingencies for the maximum beneift of their students.

Most Sunday School educators intuitively realize that a positive, accepting environment is more conducive to learning. Unpleasant experiences in Christian education have an aversive effect, making learning less likely. These considerations are not always obvious to the teacher who concentrates upon the material to be learned, but contingencies still influence student motivation. Praised children are more likely to participate, particularly when praise follows quickly, sincerely, and appropriately, the desired response. Peer approval of older children and adults is likewise effective in stimulating effort and progress.

Learning Emotions in Church

While Bible skills and content can be taught directly, affective responses are learned in a more complex manner. Perhaps it is accurrate to say that affective responses are "caught more than taught;" emotional responses are learned in a somewhat different manner than cognitive skills. How can children be encouraged to love the Bible, the church, and God?

Affective responses are not mystical or even spiritual (although emotional reactions often accompany spiritual experience). Respondent conditioning aids in a more complete understanding of emotions, particularly the emotion of fear.

Fear responses have been experimentally conditioned with neutral objects, illustrated by psychologist Watson's experiment with Albert and the rat. Emotional reactions, commonly described as fear, can be associated with nearly any object, person, or situation, and these latter circumstances may become conditioned stimuli for avoidance reactions.

Vivid, repeated descriptions of Hell, or abandonment by adults in the Rapture, can produce intense fear reactions in children. Disruption resulting from taxing a limited attention span is punished in many churches, producing fear or aggression. Even being left in

the nursery or Sunday School can produce consequences of fear. Embarrassment may produce similar reactions.

Since this fear reaction occurs in church, it can become a conditioned response to the church building. Christians in the church, and even God, may become conditioned stimuli for fear reactions. The earliest associations most people have with church is fear (Dobbins, 1975), which later can result in avoidance or at least disinterest. As Dobbins suggests, perhaps this accounts for the tragic drop-out rate of young people from church.

In contrast is the church that purposefully develops positive associations. While not avoiding scriptural eschatology, the child is more often exposed to a pleasant, accepting atmosphere for learning. Security, warmth, and affection are continually associated with the Bible, church, and God. Enthusiastic Christians and interesting activities are more likely to result in desirable affective responses. (Technically the latter is an example of operant rather than respondent conditioning. However, positive feelings are more likely to be generated in this context through modeling, intrinsic reinforcement, and social reinforcement.) Boredom and frustration are minimized in such a context.

Positive associations with Christianity should begin as early as possible in a child's life, preferably with the parents taking the initiative. A parent affectionately holding a child while reading Bible stories or talking about God is likely to develop positive associations for the child. Occurring frequently, such experiences can build a positive orientation toward the content presented.

The Sunday School teacher should use every practical means to make the learning experience a positive one for the child or adult. Bible and curriculum should be appropriate in format, conceptual level, and vocabulary for students. Feelings of affection for "God's people" easily generalize to similar feelings for God, especially with younger children. Exciting experiences in the study of the Bible are a form of positive respondent as well as operant conditioning.

Parents and teachers that force compliance to rigid and arbitrary rules too often produce rebellious offspring who avoid church as teenagers and adults. Permissive parents and teachers who fail to develop warm, controlled (non-fear producing) associations are also likely to have children who dislike church, the Bible, and God.

Fear-producing experiences should be infrequent in church. Should other interventions not be effective, punishment may need to be used as a last resort. Threat of Hell may result in seeking salvation, although too often the response of seekers is temporary. Perhaps Hell may more profitably be used to motivate Christians to evangelize the lost, as appears to be the case in the Bible.

Conclusion

Behavioral theory and technology can be a great asset to the church in Christian education, when used with care and expertise. Other areas of Christian education could be explored for the potential use of behavioral methodology, such as the Christian education of the slow learner or mentally retarded. Behavioral psychology has proved to be helpful in remedial work with such individuals, and the church may find progress likely with the help of behavioral methods when traditional procedures fail to succeed.

Behavioral techniques can be an asset to the Sunday School for both adults and children. The principles of desired contingencies, including verbal, social and even spiritual reinforcement, are important motivators at all ages. In this broad sense, every healthy church is, to some extent, behaviorally based. Exercising due care, more churches may make use of these important principles in furthering Christian education.

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Existentialism and Contemporary Morality

There has been much concern and debate over problems in the moral and spiritual realm of life in western society and culture. It is the premise of this paper that these problems have been caused by the influence of existential philosophy on Western culture and art. Further this paper seeks to suggest an appropriate means to deal with these problems, recognizing the power of this influence. Specifically, our task as Christians is the aggressive affirmation of (1) a positive meaning to life, (2) absolute standards of value (particularly in the field of ethics), and (3) Christian truth as a valid and vitally important view of reality.

Item. Those who have had the slogan "DOA" (the name of a punk rock group) written in the dirt on their car hoods may count themselves fortunate that it was not done with spray paint.

Item. Christians are breaking up marriages and families in divorce, and are even entering into adulterous relationships with other married Christians, while remaining within the church.

Item. Bonnie Thielman's book (*The Broken God*) about Jim Jones clearly shows that Jonestown may all too easily happen again.

Item. A writer for a prominent national magazine says that the fact that a high government official is very concerned about moral and spiritual decline "frankly scares the hell out of" her.

Almost everywhere you look today there are expressions of concern over the failing morals of our time, the decline of civilized civilization, and the "Me generation" in all its various forms. There is, however, little speculation on the root cause of this decay. This prime cause, if found, would give us an indication of a means to attack the problem. It may also indicate a means whereby the churches' work of evangelism may be furthered.

As examples of the types of concerns expressed these days, this paper examines three areas which, while not exhaustive, provide a broad coverage of the most commonly stated fears. In writing about the ills of our culture most authors look at the realms of (1) personal morality, (2) the rise of cultic and sectarian "religion" and (3) the economic and judicial problems of society on the national and international scale.

Personal morality is of great concern to many authors today. So much so that other people take great glee in producing a quotation in the same gloom and doom style and then revealing that it was written almost two thousand years ago. This should not give the scoffers any cause for optismism. It proves that the long-ago author knew what he was talking about: he was describing the declining Roman Empire and correctly predicting its fall. And thus, by association, we do have cause for concern.

Expressing itself usually, but not exclusively, in terms of "the young people today," there is anxiety about the reduced emphasis given to ethical considerations in governing personal behavior. Divorce, (among married couples) and sexual behavior (among their children) seems to have become largely a matter of personal taste, and traditional mores are disregarded or denounced. Vandalism and petty crime is rampant, especially among the young, for no better reason, it seeems, that to alleviate boredom. Respect for public and private property, concern for other people, common courtesy and manners; all of these seem to have disappeared from modern society.

In mitigation of this, David Watson (*I Believe in Evangelism*) sees a resurgence of interest in religion. He cites as evidence the growing interest in cults and the occult. These activities, however, do not demonstrate any commitment to orthodox religion. They are, in fact, further indication of self interest replacing spiritual interest and feeling.

The occult, in all its manifestation, is attractive because it gives "something for nothing," or at least very little. It is this advertisement of something "Free!", rather than any belief system, that contributes to the popularity of the occult. Cultic phenomena are less simple but essentially have some initial drawing card outside of their particular belief. It may be an attractive lifestyle, or perhaps fellowship (a powerful inducement in our alienated society), or even faddish appeal rather than "religion." Brooks Alexander reported at the 1979 American Scientific Affiliation meeting the efforts of certain cults to co-opt science in order to avoid seeming to be religious. This is not to say, however, that indiviuals who become involved remain unaffected by the philosophy or beliefs of the sect, cult or coven that they join. Members are almost invariably influenced without realizing that a change is taking place.

Many of the cults gaining the highest following at present are heretical or pseudo-Christian sects such as the "Peoples Temple," The Moonies," or the "Local Church." These are of particular concern because they demonstrate the danger of relativism and a too widely embracing tolerance.

Society as an entity itself displays symptoms of decay. Inflation, inequity of distribution of goods, and terrorism (which often arises out of frustration from the former two conditions), create an ever present climate of fear and uncertainty. Is it possible to propose any mechanism that impels economic problems, injustice, assassinations and local wars other than the greed and pride of individuals or groups of individuals? Examine the shooting of John Paul II, the "Irish Question," the "Polish Problem," and the air traffic situation in the U.S., and then see if you can honestly disagree with me when I say that I think not.

It is the position of this paper that all of these are aspects and symptoms of the "Me generation." Self interest, unrestrained by outside considerations, contributes to the ills of society. It all too frequently characterized the arguments on both sides of the constitution debate. As has been shown, it is the major factor in the growth of cults. The idea that there can be no proper impediments to gratification has almost destroyed traditional morality.

There is a lack of commitment to any ideal, object, or person. (This cannot help but be a contributing factor in the high divorce rate.) Since a stand that one has taken may later become embarrassing, "tolerance" has become a euphemism for expediency. Fanaticism is thus avoided but the cost in terms of heresy, immorality and alienation is high, perhaps too high for society to accept.

Sentiment also has become embarrassing. Not merely the "hearts-and-flowers" romanticism, but the stronger sentiments such as patriotism, sacrifice, pride of work and love. Our society has confused cynicism with sophistication. Peter Newman has stated in *MacLean's* that his hopes for the future generation lie in the fact that (1) they are less gullible than their elders (a questionable assumption itself), (2) they realize "the middle class values" are less desirable than they appear, and (3) they know that it's more fun to "fight city hall" than to work with it. Reporting on the Century III Leaders conference, *Time* finds the most interesting aspect of these chosen high school students was their command of trivial dialogue, sarcasm and minor rebellion. If these are accurate views of the younger generation one cannot help but pity these students facing a future with a superficial, cynical and destructive view of the world.

The problem that society faces is not so much immorality as amorality: a complete lack of ethical considerations rather than an unacceptable ethic. Amorality is the logical end result when relativism and liberalism are applied to the field of morality. Seeing both sides of a question is fine, but on the other hand when the number of "other hands" becomes greater than the substance of the question, it loses all but the most academic interest.

Our society's high emphasis on liberalism is a heritage from the enlightenment. Ironically enough, the enlightenment grew out of the Reformation's reassertion of the importance of the individual in God's plan. The enlightenment, however, elevated the individual to such an extent that the centrality and importance of *God* in the life of the individual was lost, giving rise to humanism. Once the central figure in the universe had been removed it was, of course, inevitable that a philosophy would arise which stated that man was an orphan in an uncaring universe, that morality had no basis and that life was meaningless. The name of this philosophy is existentialism.

Existentialism affirms that what exists exists, and there is no greater meaning or purpose to life. Therefore, there is no need to pay attention to standards or values, since everything is judged relative to the judge himself and his feelings. No commitment is necessary to anything outside yourself, unless you feel a need to commit yourself, and then only for as long as you feel that need. Self-interest is the only goal and there are no moral limits to self-gratification. Since everyone feels the same way, cynicism is a

good defense against others. Meaninglessness, relativism, non-commitment, self-interest, gratification, and cynicism; these are the watchwords of existentialism.

Existentialism leads to, and is reinforced by, various aspects of the "Me generation" discussed earlier. Nihilism and terrorism in politics arising out of feelings of desperation promote feelings of helplessness and depression in the general populace. Absurdist art, and particularly absurdist comedy affirm existentialism. It is also interesting to note that almost no contemporary writers can really deal with evil: real evil as opposed to the merely sordid. Modern philosophy is immediately indentifiable by virtue (or vice?) of its lack of discipline and rigor, and its emphasis on relativism.

Existentialism therefore shapes modern thought, even though most people have never heard of it. Many people will not recognize the term, but will describe their personal philosophies very much along the lines described above. This "unconscious influence" was once demonstrated by a fellow who said he was a strong Christian and practiced Transcendental Meditation only for its therapeutic value. When challenged to prove it by revealing his mantra he would not, thus proving that he did indeed subscribe to the T.M. values and philosophy.

Relativism, and its attendant lack of desire to clarify issues, makes all of these effects, unconscious though they may be, very resistant to change. Most people today have no desire to inquire after truth. They have lived for a long time with the vague notion that there are no absolutes, and they feel that any pursuit after an absolute standard of truth, or any other kind, is a waste of time. Hence they have no desire to examine their own beliefs. If what you believe does not get you into immediate trouble, why change your mind?

Amorality, and the relativism that attends it, are therefore the primary difficulties that the Church must overcome if it is to continue its commission of evangelism. Relativism must be attacked on two levels: in the realm of truth where it denies meaning and standards in life, and also in the area of values to prevent it from rendering commitment a thing of the past. Various actions must be taken to combat the other effects of existential philosophy. Selfishness, the penchant for immediate gratification, cynicism and the other attitudes previously mentioned are all areas against which we have effective measures, but these will not remain effective if relativism is allowed to erode the concepts of truth, goodness and sin.

The proper actions to take will not be easy to perform, and not always easy to decide. Those whom we must oppose have professional sociology, Madison Avenue and Hollywood behind them: we must put the same professional rigor into our side of the battle. Our actions must be governed by the same degree of intellectual effort that the rest of society expends in gratifying their own desires and avoiding the truth. We must not be merely reactionary but must react thoughtfully.

We are commanded to love God with the mind as well as the heart, soul and strength. This injunction is especially important in fighting a philosophy and the heresies, half-truths and undiscipline attendant to it. We must give of our time, thought and concern, We must be willing to learn, to make ourselves ready to recognize heresy, cultic statements, and existentialism, hidden as it is in all its vagueness. And we must be willing to fight it.

In fighting the Church's work of evangelism, existentialism must be considered one of the devil's principal tools. *Homo mores:* moral man, is the only man worth saving; *homo apatheticus* is fit fodder for hell. The fact is that modern philosophy has rendered man very apathetic about spiritual conditions in general and sin in particular.

We profess to "preach Christ, and Him crucified" in many of our churches. Preaching Christ is announcing the fact, preaching Him crucuified is proclaiming our need. Our need of Christ, however, is based upon our sinful nature, and if modern society has no concept of sin, then it can see no need for Christ. We have discarded the cliche ridden "hellfire and damnation" sermons but we desperately need an appropriate replacement for them.

The preceding two paragraphs present a difficult problem. The only solution I can see is to state in addition to the foregoing that (a) God considers every man worth saving and that (b) all of us are infected with the disease of sin and we must accept this and call for help at all times.

Evangelism is not a numbers game, but rather our concern for individuals who are lost without Christ. We must be concerned enough to study the greatest and most insidious heresy of our time, and confront it every time we find it.

Existentialism affects our society in many ways, the most important of which is that it has rendered modern man blind to his need for redemption. Society itself needs to take action against existential philosophies if it is to survive; in purely human terms we must learn to recognize and attack statements based on existentialism. The Christian has an additional task: to reaffirm meaning, moral standards, man's fallen nature and his need for God' redemption.

Postscript: While researching and writing this article, the only person who volunteered a knowledge of existentialism in general conversation was a musician with a Christian rock group form Kelowna. He, and his colleagues, have identified the existential influences in contemporary music and are trying to counteract them by presenting the Christian message in the popular idiom. They are using their musical talents, their minds, their knowledge, and are maintaining a high professional standard in their work. Many churchpeople would censure these young men for their involvement with rock music. Do those same churchmen have the concern and commitment that these fellows have demonstrated with their lives?

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COSMOS by Carl Sagan, Random House N.Y. (1980). 365 p.

Beginning in the Fall of 1980, it was my pleasure to be the television instructor of record for Mesa College's offering of Carl Sagan's *Cosmos*. The course was offered under both a Humanities and Physical Science course number. The text by Carl Sagan was not avilable at the time the course started, and for administrative reasons never became a required text. I am confident, however, that it is a very valuable supplement to the television series. The text is larger in scope than the series, containing considerable material not shown on television. To grasp some idea of the importance and magnitude of the project, one needs only to be aware that it had a projected world-wide audience of 140 million.

Sagan's ordering of topics is logical, not chronological, so stellar evolution and the big bang aren't developed until Ch. 9. The theme of *Cosmos* is evolution. For Sagan, evolution is fact, not theory. From the opening of the T.V. series through the program dealing with stellar evolution, it is the dominant motif on which events are hung, or predictions made. The T.V. sections on the function of DNA are the best, for a general audience, I have seen. Because of evolution and a law-abiding universe, Sagan is free to speculate about evolution elsewhere, and he chases his favorite, extraterrestrials, at the end of his overview chapter on biological evolution. Here he imagines "Hunters and Floaters" on a Jupiter-like planet. In the T.V. series, I believe too much time is spent in speculating about these huge imaginary monsters, although I admit the medium lends itself to Sagan's fantasies.

With reference to evolution, Sagan is at his best in Ch. 7, "The Lives of the Stars." (p. 218)

> To make an apple pie, you need wheat, apples, a pinch of this and that, and the heat of the oven. The ingredients are made of molecules—sugar, say, or water. The molecules, in turn, are made of atoms—carbon, oxygen, hydrogen and a few others. Where do these atoms come from? Except for hydrogen, they are made in stars. A star is a kind of cosmic kitchen inside which atoms of hydrogen are cooked into heavier atoms. Stars condense to form interstellar gas and dust, which are composed mainly of hydrogen. But the hydrogen was made in the big bang, the explosion that began the cosmos. If you wish to make an apple pie from scratch, you must invent the universe.

He then proceeds to do so, discussing stellar and cosmic evolution.

Another theme of humanist Sagan is the glory of intellectual freedom and human progress. This is illustrated by his comments about Immanuel Velikovsky and about Christian Huygens, as well as the Ionian philosophers. With Velikovsky, he begins by reviewing his ideas and then says, (p. 91)

> But science is a self-correcting enterprise. To be accepted, all new ideas must survive rigorous standards of evidence. The worst aspect of the Velikovsky affair is not that his hypotheses were wrong or in contradiction to firmly established facts, but that some who called themselves scientists attempted to suppress Velikovsky's work. Science is generated by and devoted to free inquiry: The idea that any hypothesis, no matter how strange, deserves to be considered on its merits. The suppression of uncomfortable ideas may be common in religion or politics, but it is not the path to knowledge: it has no place in the endeavor of science.

In talking about Huygens, Sagan glories in the free intellectual climate that was Holland's in the 15th century. It is clear, after paying tribute to Huygens' many intellectual accomplishments, that Sagan believes they were made because Huygens thought, "The world is my country, science is my religion."

In the chapter, "Backbone of the Night," Sagan begins with his speculations of what primitive man might have thought about fire and the sky. From here it is a stepping stone to the gods and that leads to real science, the Ionian philosophers. This is yet a third theme of *Cosmos*: the greatness and sufficiency of science. Thales, Anaximander, Empedocles, Democritus, etc., are all given good coverage and appropriately lauded. The treatment of Pythagoras, who was a mathematician as well as a religious mystic, reveals Sagan's bias once again. (p. 185)

> They did not advocate the free confrontations of conflicting points of view. Instead, like all orthodox religions, they practiced a rigidity that prevented them from correcting their errors.

From my perspective, much more objective reviews of the

Pythagorians are given by Bertrand Russell or W.T. Jones in *A History of Western Philosophy.*

If Pythagoras, is under attack, watch out, Plato! Sagan accepts B. Farrington's reasons—slavery and a failure to appreciate manual work as a reason for the demise of the Greek science. In addition, religious views of the Greeks transmitted to Christianity caused the early church to be other worldly centered. So science, man's true savior, languished.

Sagan has a varying style, but has been roundly critized for his early shots of his profile smiling into space in his space craft. Rightly so. The monitoring screen—on which the important stuff is taking place—was about the size of his nose. At other times, excellent use was made of his medium, as in the mentioned DNA activity.

His writing style is chatty and casual, often with personal reminiscences. Again, he can be quite poetic. (p. 265)

> There is an idea—strange, haunting, evocative—one of the most exquisite convections in science or religion. It is entirely undemonstrated, it may never be proved. But it stirs the blood. There is, we are told, an infinite hierarchy of universes, so that an elementary particle, such as an electron, in our universe would, if penetrated, reveal itself to be an entire closed universe.

While his style is poetic, what stirs his blood is interesting and makes orthodox Christian and Jewish theology seem pretty plausible.

Very early in the series, the humanists and religious members of my class, as well as their instructor, became offended by Sagan's scientism. Later on in the series, and in Chapter 10, Eastern religions are given a favorable view. (p. 285)

> There is the deep and appealing notion that the universe is but the dream of the God who, after a hundred brahma years dissolves himself into a dreamless sleep. The universe dissolves with him—until, after another brahma century, he stirs, recomposes himself and begins again to dream the great cosmic dream. . .It is said that men may not be the dreams of the Gods, but rather that Gods are the dreams of men.

Sagan much prefers cosmic eggs to *creatio ex nihilo.*

As to a first cause argument, Sagan writes (p. 257):

> But this is mere temporizing. If we wish courageously to pursue the the question, we must of course ask next where God comes from. And if we decide this to be unanswerable, why not save a step and decide that the origin of the universe is an unanswerable question? Or, if we say God has always existed, why not save a step and conclude that the universe has always existed?

Instead of seeing each answer as perhaps equally powerful, his anti-Hebraic bias runs rampant. And he in no wise answers Kant or the Jewish or Christian mystic.

Sagan's bias against western religions (Judaism, Christianity, Islam) begins early . . . and is shown on p. 29, where he talks about fossil evidence for evolution.

> The fossil evidence could be consistent with the idea of a great designer; perhaps some species are destroyed when the designer becomes dissatisfied with them, and new experiments are attempted on an improved design. But this notion is a little disconcerting. Each plant and animal is exquisitely made. Should not a supremely competent designer have been able to make the intended variety from the start? The fossil record implies trial and error, an inability to anticipate the future, features inconsistent with an efficient designer (although not with a designer of more remote and indirect temperament).

It is clear to any Christian who believes in evolution, and it is consistent with evolutionary theory in general, that the forms that existed in the past fit that environment, and as the environment changes so did the life forms. This idea is consistent with western religion as well. If, on the other hand, Sagan is asking why the Creator didn't just zap today's world into existence, that too is answerable from a Hebraic perspective. The Hebraic God is the God of history, and He works in linear time. The absence of time would result in revelational problems.

While on the topic of evolution, one must also question Sagan's assertion that evolution is fact, not theory. From this reviewer's perspective, theories are what science is all about. Theories answer, within a mechanistic framework, why laws operate the way they do. They are conceptual models or even mathematical models that explain or picture. Almost all philosophers of science agree that theories cannot be proven true and that their usefulness to science is key, as is their method of testing, which includes falsifiability. For Sagan, for reasons only he knows, to assert that evolution, the central and grand theory of biology, is a fact, is disturbing. His very dogmatism is reminiscent of the religious groups that he opposes. By extension, would Sagan be willing to assert that the big bang theory is now fact, since the discovery of the 3 degree background radiation? I trust not.

When talking about Newton, Sagan quotes from Keynes, who emphasized his religious heterodoxy. (p. 68) When describing his later life, he mentions his work on alchemy and in the Royal Society, avoiding his great love of theology. I must conclude that either this is deliberate on Sagan's part or he is uninformed.

While the text and T.V. series had much to commend them, they were marred by an "intellectual ham" who, too often, wanted his profile in everything. In addition, they were marred by his anti-western religion bias. In his view of history, he finds not one good thing to say for the most powerful book whose religious view is the view of his culture. The biblical world view allows for science, while Eastern world views do not. But Sagan can't deal with that. Consequently, his book's value to humanities classes is significantly reduced.

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SPACE, TIME AND INCARNATION by Thomas F. Torrance, Oxford University Press (1969). 92 pp., $2.50 paperback

This small volume consists of three lectures which Torrance, a professor of Christian Dogmatics at the University of Edinburgh and author of several works on the relation between science and theology, delivered in 1968. The book was originally published the following year and re-issued in paperback in 1978. Although the physics of space and time has undergone tremendous advances in the years since the original lectures, the ideas presented here have lost none of their initial relevancy.

The first two lectures examine the role of spatial concepts in the formulation of the Nicene Creed, in the development of Reformation Theology, and in modern liberal theology. Chapter 1 describes the Nicene concept of a space which is closed on the human side while remaining infinitely open on God's side. The next chapter traces the rejection of this concept in favor of the Aristotelian "receptacle" view which, according to Torrance, led to a fundamental dualism in German Protestant theology that culminated in the modern "antithesis between phenomenal events and eternal ideas" (p. 42). It is the author's contention that when the Incarnation is regarded only as the entry of the Son of God into a finite receptacle, or even when God himself is viewed as the receptacle (Newton), one is led logically to qualify the reality of Christ's human nature and/or to apply to humanity in general his divine attributes. Historically, both situations developed. In German theology particularly, the divine attributes of Christ came to be regarded "only as a special and exemplary instance of man's own capacity for the divine" (p. 41). "The very thing that Luther feared and fought against so hard, the transmutation . . . of ontological relation into symbolic relation came about" (p. 42). Such transmutation is exemplifies in the "demythologizing" of Bultmann, where historical facticity was rejected as having no place in the foundation of faith.

In temporal terms, Torrance continues, a receptacle view of space led untimately to a God who had no existence independent of human conciousness; Christ became abstracted from space and time and was understood only as a "thing for us" (p. 42). Thus modern theology was forced to discard the past as meaningless to an individual in the present. Similarly, such a theology had to deny the individual any future existence, and thus any hope of a resurrection. Trying to understand God solely in terms of human logic within the framework of the receptacle model of space is demonstrated to have resulted in an interpretation of the present as a "timeless instant", so that the only thing that really matters for the individual is that which is "for me, here and now" (p. 49).

After tracing the logical consequences and failure of theology based on the Aristotelian model of space, Torrance proceeds in the third chapter to suggest

> . . . Now that the receptacle notion of space and time has broken down, although the confusion to which it gave rise, not least in the understanding of history, is still rife, we need to rethink the essential basis of Christian theology in the relation of the Incarnation to space-time, and to think completely away the damaging effects of a deistic relation between God and the Universe (p. 59).

In the concluding pages, the author outlines how this might be accomplished, proposing that the key to such rethinking is to be found in the relationship of God to both the creation and the Incarnation:

> . . . Instead of the false dualist approach in which we would be forced to interpret the space-time of the Incarnation in concepts that we had already developed independently in some area of natural knowledge, we must seek to build up a specifically theological interpretation . . . within the unitary interaction of God with our world in creation and Incarnation, and within the unity of the rational structures that result from that interaction (p. 70).

> Since in Jesus Christ the eternal Son has entered within the contingence of the created order, making it His own, He may be known only in and through its creaturely freedom and spontaneity, and therefore not in any *a priori* manner; yet since His created actuality in this world results from the transcendent freedom of God in condescending to become man, we cannot know Him truly except in accordance with that divine movement in the Incarnation and on the ultimate ground of God's unconditional self-giving in Jesus Christ. It is out of His fulness that we receive, grace for grace (p. 74).

Torrance likens the problem of overcoming the apparent dualism between the spiritual and material realms to that of resolving the paradox of simultaneous particle and wave properties in quantum theory. The confusion and irrationality of modern theology is, in the author's view, due to an attempt to apply the language and methodology of a theologically "particulate" theory to an essentially "field" phenomenon. Just as a full understanding of the behavior of matter requires an extension of classical physics to quantum theory and relativity, so Torrance argues that theology must not only be coordinated with everyday experience but must at the same time also establish its formal proofs in wider, higher formal systems.

It is now recognized that any logical system which claims to be both complete and self-consistent must, as a consequence of Goedel's Incompleteness Theorem, be meaningless in the final analysis. Theology, like any other formal system, must contain undecidable propositions and must, therefore, find its ultimate meaning through reference beyond itself. Theology must test the empirical correlates of its basic statements for truth or falsity "within the organizing principles of the higher level over those statements which it shares with the level below it and which are not absolutely decidable within it" (p. 90). Thus God himself becomes the touchstone of truth, which is just what orthodox Christianity has always maintained.

Although this book lacks the technical detail of such works as *Cosmology, History, and Theology* (Yourgrau and Breck, Ed.) or Philberth's *Der Dreieine,* some background in modern physics is essential for readers if Torrance's arguments in the third chapter are to be fully appreciated. Occasionally the author seems to misconstrue

some of the implications of the Einstein field equations. For example, on page 68 he falls into the common error of making the theory of relativity say that neither space nor time are absolute. The point is that although observers in different reference frames obtain different values for the spacial and temporal quantities that characterize the phenomena they observe, when these quantities are interpreted from the proper perspective, all observers agree. This is the essence of the General Theory of Relativity (which Einstein originally called "Invarienten Theorie") and also, it seems to me, of Torrance's fundamental thesis.

The title might lead a reader to expect a treatment of both space and time, but the analysis is in fact confined almost exclusively to the former topic. This is to be regretted, since many of Torrance's ideas about space have profound theological implications for the subject of time also.

The third chapter is essentially a program for action, and its implementation is reflected from time to time in the articles that appear in the pages of the *Journal ASA*. There is, however, a wealth of ideas remaining to be developed more fully. In particular, Torrance's view of an "upward open" epistemology would seem to have important implications in the current debates about inspiration and inerrancy. Although not everyone will agree with all of Torrance's ideas and interpretations, anyone seriously interested in the interaction between science and Christian faith should read this book.

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ROOTS OF WESTERN CULTURE: PAGAN, SECULAR, AND CHRISTIAN OPTIONS, by Herman Dooyeweerd, trans. by John Kraay, ed. by Mark Vander Vennen and Bernard Zylstra, Wedge Publishing Foundation, Toronto, 1979, xii + 288 pp., $12.95.

Anyone who has encountered the writings of Herman Dooyeweerd knows how impenetrably dense they can be. His monumental *A New Critique of Theoretical Thought* is painfully abstruse and his North America lectures, *In the Twilight of Western Thought,* though less weighty, still confront the reader with a net of obscure neologisms. One suspects there are golden insights to be had but is often pressed by time to forego the effort.

Then there is this volume. Here is Dooyeweerd at his most accessible to North American readers. The book consists of fifty-eight articles originally published in the weekly *Nieuw Nederland* between the years 1945 and 1948. They were intended as a call to the post-war nonacademic Dutch community to begin dialogue on the task of reordering the whole of social life according to biblical directives. A tall order, but Dooyeweerd entered the exchange with a passionate commitment to Christ and cogent intellect.

After an introductory essay calling the public to dialogue, Dooyeweerd launches into what might be called a philosophy of Western civilization from the early Greeks to the twentieth century. It is Dooyeweerd's conviction that Western culture has been oriented by four basic "ground motives": the Greek form-matter, the Medieval nature-grace, the humanistic nature-freedom, and the biblical creation-fall-redemption. These ground motives have been, in his words, "the deepest driving forces behind the entire cultural and spiritual development of the West" (p. 9). While the biblical ground motive offers an ultimate harmony in the eschaton, the others will necessarily generate "polar tensions." The bulk of the book is thus taken up with illustrations of these tensions in Western history.

Throughout Dooyeweerd develops the social-political and medieval political models and modern brands of absolutism and democracy. His final discussion exposes the nagging dilemmas of sociology's development as an academic discipline with sidelight observances on the social sciences in general.

One would think the urgent and provincial intent of these essays would constrict their broader utility. They are, however, suprisingly wide in scope and fluid in application. Dooyeweerd's views are extremely important, not only for discerning the relation between theoretical thought and its social matrix, but for probing the meaning of such abstract realities as "the state," and related matters.

Dooyeweerd claims to be presenting a consistently "biblical" way of looking at such things. All readers will want to pause and reflect at the threshold of such claim: In what way does he mean this to be a "biblical" view? In a textual fashion or by way of principles? Dooyeweerd seems to answer sometimes with the first, other times with the second. Such duplicity, though a barrier to ongoing dialogue, only underscores the complexity and challenge of his task. It is a persistent question to which his followers must still work out a satisfactory answer.

Notwithstanding, this is a valuable book, amply endowed with imaginative insight and charged with spiritual fervor. For anyone with an interest in history, sociology, politics, or philosophy this volume will contribute liberally to your curiosity.

Reviewed by Peter W. Spellman, History Department, Boston College (graduate fellow), Salem, Massachusetts 01970

LONELINESS by Craig W. Ellison, Christian Herald Books, Chappaqua, New York, 240 pages, $8.95.

This book considers the dimensions of loneliness including kinds, causes, and cures. Loneliness can attack all ages. It can be caused by a host of villains. Since everyone is lonely, everyone must learn to deal with loneliness if a reasonably satisfying life is to be achieved. The cures require a clear thinking, assertive person willing to assume responsibility for loneliness and to cope with it in an active, creative way. A spiritual orientation that is based on Scripture is especially useful.

Ellison is a trained psychologist and he uses his background to supply a lot of interesting empirical information. This sets it apart from a collection of sermons. While there is a good deal of Scripture included, it is deftly worked into the topics in a relevant and useful way.

Many illustrative facts are included: there is one divorce for each 1.8 marriages, 50,000 suicides occur yearly, a million teens are alcoholics, and half of all children born will live in single parent families. These statistics point to the problem of loneliness.

Ellison is very quotable: "We have to go through a more stringent test to get a driver's license than we do to get married or have kids" (p. 182); "The notion of planned obsolence has spread from cars to spouses" (p. 139); "Many Christians try to run a spiritual Cadillac on a thimble of gas" (p. 59).

The book has some minor imperfections. For instance, the rhetoric on page 10 states that loneliness "is talked about practically everywhere," while on page 17 the reader is told that "nobody talks about it." The grammar is recurringly incorrect (pp. 105, 113, 133, 139) and there is a good deal of topic redundancy. The generic use of "man" is not congruent with its elimination from all American Psychological Association publications.

It is obvious that the author knows a lot about lonely people and cares deeply about their plight. His book should be widely circulated among Christians and non-Christians for it can be helpful to everyone.

Reviewed by Richard Ruble, Department of Psychology, John Brown University, Siloam Springs, Arkansas 72761.

SPEECH, SILENCE, ACTION! THE CYCLE OF FAITH by Virginia Ramey Mollenkott, Abingdon Press, Nashville, 144 pages, $7.95.

The author of this book is professor of English at William Peterson College in New Jersey and author of *Women, Men, and the Bible.* These three topics continue to capture her attention in this book. She elaborates on them and some related topics including liberal arts, homosexuality, pluralism, sexism, and sexuality.

Mollenkott has a flair for writing illustrated by her selection of words, analogies and metaphors. She deals with a good many controversial topics and therefore will alienate some of her readers. Favorable comments are rendered about ecumenism, the ordination of women, and the equal rights amendment. Disturbing to Mollenkott are fundamentalism, the nuclear arms race, and sexists such as Phyllis Schlafly, Marabel Morgan and Bill Gothard.

Perhaps Mollenkott's most controversial ideas relate to homosexuality. She believes that the Bible is silent about the homosexual orientation and homosexual love but rather addresses exploitative sexual acts. One chapter is entitled, "The Divine Worth of Gay Persons." Social scientists will be skeptical about her claim that "scientific findings" have shown the homosexual orientation to be niether sin nor sickness. Science, of course, makes no such value or moral judgments.

Reared in a fundamentalist environment, Mollenkott grew up exposed to ignorance, intolerance and bigotry. In addition, she has known the loneliness of divorce and obesity. Out of these experiences she has evolved her cycle of faith characterized by speech, silence and action. She writes candidly and warmly and her book will interest those seeking fresh perspectives on the meaning of Christian wholeness.

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HISTORY IN THE MAKING. AN INTRODUCTION TO THE STUDY OF THE PAST. by Roy Swanstrom. Downers Grove, Illinois: InterVarsity Press, 1978. $3.95, 137 pp., ISBN 0-87784-581-6.

History in the Making is a succinct, readable discussion of the nature and study of history from the Christian perspective. It is intended specifically for the beginning college student, although any layperson desiring a basic understanding of the interaction between Christianity and history would gain much from this book. It also serves to warn those who might be misled by simplistic or manipulative uses of history. Since Christianity is a faith "wrapped" in history, it behooves Christians to be especially knowledgeable about the nature of history.

Swanstrom analyzes the role of history and the historian

who is seeking to answer the question "What is history?" He briefly discusses the sources available to the historian and how the historian uses the available information subject to his or her perspective of the past. For a beginning student overwhelmed with different theories of where history is going, Swanstrom offers some helpful historiographical discussions on different theories of history from a cross section of historians such as Karl Marx and Thomas Carlyle. He also analyzes the cult of progress that became popular in the nineteenth century and had such an impact on modern technological society.

The author believes that one's adherence to the Christian faith helps in the study of history, but he also points out the failures of some Christians' approach to history. Among these failures have been the willingness of Christians to perpetuate historical untruth and a readiness to believe anything that might appear to have a divine cause. He also feels Christians must guard against a preoccupation with religious factors.

This is a book that deserves a wide reading in the Christian community especially since modern culture has such a non-historical perspective. If Christians truly believe their God is a God involved in history, it should not just be the Christian historians who are concerned with the past.

Reviewed by Paul Kubricht, Associate Professor of History, Le Tourneau College, Longview, Texas 75607.

WHAT IS SCIENCE?: AN INTRODUCTION TO THE STRUCTURE AND METHODOLOGY OF SCIENCE, by V. James Mannoia, University of America Press, 1980, 149 pp, $7.25

V. James Mannoia's book is a philosophy of science text designed for undergraduate use. Its use requires neither a background in philosophy nor science as it is very much an introductory text. Dr. Mannoia addresses the problem of the "Snow Gap;" that is the cultural gap between science orientated people and humanities oriented people as described by the late C.P. Snow. In particular two attitudes that reinforce this gap are examined. One is the fear or fascination members of the liberal arts community often have of the science community due to the latter's very visible fruit. The second is the attitude of superiority some scientists have, believing their's to be the one truly objective field of study. Mannoia's solution to the "Snow Gap" is to bring both sides to a better understanding of the scientific process. To this end five chapters have been written to cover five aspects of scientific ideas, i.e., the formation, developement, nature, use, and limitation of scientific ideas.

The whole of the book is well organized and composed, containing many understandable examples and illustrations. The first two chapters are particularily well done, showing clearly the distinction between scientific method as practised by individuals and the development of ideas by many people through time. The first is psychological activity, the second more sociological. Students using the book will be helped by the outlines at the end of the book. More serious students of the philosophy of science will find the book too cursory. However, for its intended audience the text is quite satisfactory.

Reviewed by William W. Cobern, Science Education and Culture, University of Sokoto, Sokoto, Nigeria.

PSYCHOLOGY AND ALCHEMY by C. G. Jung, Princeton University Press (1980). Paperback, 571 pages. $8.95.

Carl Gustav Jung's achievement stands as a unique monument to the possibilities of human self-understanding. His psychology of the unconscious has revolutionized many of the basic assumptions underlying western thought—in turn providing us with new perspectives from which to view man and culture. Perhaps the discipline to experience Jung's impact most acutely, outside of psychology, was that of the phenomenology of religion, that is, the history of religion and comparative religion. Jung's efforts have equipped the historian of religion with a new mode of critical analysis that can be brought to bear on the multitude of religious symbols, images and rites previously inaccessible.

Psychology and Alchemy stands at the heart of Carl Jung's analytical psychology. The book examines how the symbols, images and ideas surrounding arcane alchemical processes had been brought together—unknowingly—to form a primitive psychology. Just as Freud discovered that dreams described the inner psychic states of the dreamer, Jung herein holds to the idea that alchemical symbols—also appearing in dreams—arose from deeper, archetypal layers of the psyche.

The first part of *Psychology and Alchemy* is a major introduction to the massive tome that follows. Part II has as its binding theme an objectively solicited dream series, whose material is then subjected to the process of amplification. Relevant meanings and associations are explored in detail and related to ideas current in the alchemical traditions. In the process, Jung reveals how developmental psychical components express themselves oneirically, while demonstrating his famous method of working with dreams, visual impressions and hypnagogic visions, and using their images as raw data. From the beguiling pattern that forms, Jung offers as a hypothesis his controversial unconscious

structure of the human personality, along with its underlying dynamic towards maturity and wholeness. This topic is specifically covered in the sections on the mandala.

The third part of the book, entitled "Religious Ideas in Alchemy," deals more directly with parallels between alchemical processes and human psychology, highlighting such themes as the Lapis-Christ parallels and the Unicorn as symbol.

This volume is of interest to Christians not only because of the staggering scope of its scholarship and the colossal breadth of its erudition (this edition contains 270 illustrations from a variety of alchemical sources), but also because it focuses on the creative current at the core of religion and religious experience, and indicates the guises this elemental impulse has taken in the past. Scientists—materials scientists in particular—should take note of this work, regardless of how unsystematic and disorderly the material is presented, because it reveals how the religious quest was the true goal of the alchemist's labors to turn lead into gold.

Reviewed by Glen S. McGhee, Member, C. G. Jung Foundation, 90 Blydenburgh Avenue, Smithtown, New York 11787.

KARL MARX: A CHRISTIAN ASSESSMENT OF HIS LIFE AND THOUGHT by David Lyon, InterVarsity Press, Downers Grove, Illinois (1979) 192 pp. $5.95

In an age in which Christian social activists like the martyred-priest-cum revolutionary are accepting Castor's thesis that revolutionary Christians should form a "strategic alliance" with revolutionary Marxists, it is important for all Christians to consider carefully the philosophical underpinnings of Marxism. This book, difficult though it is, performs an important service in contrasting Marxism and Christianity.

First, it is necessary to recognize the fundamental distinction between Marxism and Christianity. In Lyon's words, "Here is the titantic atheism of Marx in a nutshell: man can remake himself, he is his only sun." Marxism lies squarely in the camp of humanism and thus is inescapably opposed to Christianity. Both Christianity and Marxist-humanism purport to deal with what Francis Schaeffer calls the "totality of reality." Both cannot occupy the same space.

Within the Marxist concept of the totality of reality is the answer to all moral issues. Lenin denied that morality could be drawn from some conception beyond man, beyond class summing up morality by stating "good is what advances the cause of revolution." Lenin taught that "Every defense or justification of the idea of God, even the most refined, the best intentioned, is a justification of reaction."

Marx gave a religious meaning to revolution. Through revolution Marx looked for the general regeneration of mankind. Through human independence from all rules and structures, a regenerate man will create a new society in brotherhood. But Christians know that regeneration can come only from submittal to the perfect law and structure of God.

Marxists increasingly recognize the need for a "new man" to achieve their economic and social goals. Mao was trying to create a selfless people in China; he wanted to change human nature as well as economic conditions; under Khruschehev, the Communist Party USSR set as a high priority the training of "men in the spirit of communist morality" and recognized that it must "renew them spiritually and morally." But as Lyon points out new people do not appear spontaneously and evidence suggests that no socio-economic change can produce them.

Lyon quotes Josif Ton, a Rumanian Baptist, as saying:

> Socialism is fighting against its own interests when it maintains the war against religion. Socialism needs the new man, the moral man...Only the Spirit of Christ can revolutionize a man, transform him, and make him a new kind of person.

Lyon establishes the incompatibility of Christianity and Marxism. Marxists need Christians to produce the "new man;" Christians have no need of Marxists. Lyon sums up the sphere of Marxism: "Marxism is a human response to Christian failure to practice the truth in every sphere of life. It highlights the inescapable deficiencies which have too often characterized Christian commitment."

Reviewed by David C. Hjelmfelt, Attorney at Law, 634 So. Mason, Fort Collins, Colorado 80524.

OUR FRAGILE BRAINS: A Christian Perspective on Brain Research by D. Gareth Jones, Intervarsity Press, Downers Grove, Illinois 60515, $8.95 1981, page 278.

My first introductory physiology textbook was British—the Winton and Boyliss text which at the time was quite small by today's standards. I learned then and have respected since the British as authors in general, especially for their easy reading style and the comprehensiveness of their writing matched by none in the world. That few American (or other) writers are capable of writing with such clarity of thought, simplicity and ease of communication and comprehension has continued to impress me since those early days of my professional education. I find Dr. Jones' book no less than my best expectations. It contains

few Briticisms which would make for difficult reading for the cultural American more used to the stilted styles of our works.

From the beginning with an overview of the historical perspective of the development of the concepts that bring us to our current knowledge and understanding of brain structure and function, Dr. Jones has produced a book that anyone interested in the neurosciences can understand and comprehend in both its vastness and its beauty. He gives a good discussion of language development from a semi-evolutionary perspective and a fairly thorough discussion of the brain's part in "being human." Humanness is a function of normal structure *and* normal balanced biochemistry. This leads into a discussion of damaged (structurally altered intentionally or accidently) brains and personality, including many aspects of personality and personhood that are frequently quite difficult conceptually for the Christian raised in our sometimes quite narrow "biblical" perspective, managing all the while to do just that—maintain a thoroughly sound Christian perspective.

He discusses the complex societal and ethical issues of brain control including psychosurgery, violent behavior and modification of personality and behavior with drugs and Pavlovian techniques. He then flows very smoothly into environmental influences such as nutrition (and malnutrition) and the "new age" counterfeits, then on to contemporary dualism and human dignity most eloquently and appropriately.

This small book has a vast potential audience especially among health care personnel of all ilk. Certainly even physicians will find areas that will inform and broaden their perspectives because few of us have had the breadth of experience or training to make this book superfluous. Those not even in the health related professions will find this work virtually seminal for the Body of Christ for practically all the discussion parallels Scripture—though it does not always explicitly say so; but, then, why should it?

This book is especially valuable in the perspective it puts on the problem of responsibility of the individual after brain damage, including a balanced approach to psychosurgery. There are few failings in the book and the only one of importance—and I did not find it much detracting for I feel it too often is used as a cop out for ignorance or laziness—is that there is no discussion specifically about the person and work of the Holy Spirit.

If you are a Christian or a non-Christian seeking the truth that it might put things in proper perspective, this is one book that you should read.

Reviewed by Donald C. Thompson, Private practice of Whole Person Medicine, 828 West Fourth North Street, Morristown, Tennessee 37814.

DON'T LET YOUR CONSCIENCE BE YOUR GUIDE, by C. Ellis Nelson, New York: Paulist Press 1978. Paperback, 100 pages, $1.95.

This is a dandy little book which should be thought provoking to many readers of this *Journal.* Any assessment of the book must keep in mind that it was written as a general outline, without much documentation or elaboration intended, and that it was written "for ministers and seminary students with a theological background and some knowledge of the social sciences." The author, who is president of Louisville Presbyterian Theological Seminary, has the goal of allowing the reader to "decide quickly on the merits of the overall argument," and so important details at times "lie hidden in the text." Hence, what might seem to the knowledgeable social scientist as a shallowness in places is a consequence of the author's conscious goals and choices.

Nelson's purpose is threefold. First, he seeks to show that conscience is an unreliable guide to Christian faith because it is formed during infant and child socialization. He sketches a theory of how the conscience is formed that recognized the importance of both the "negative conscience" (with guilt central) and the "positive conscience" (ego ideal).

Books Received and Available for Review

(Please contact the Book Review Editor if you would like to review one of these books.)

H. H. Barnette, *Exploring Medical Ethics,* Mercer University Press

L. Bergman, *The Rediscovery of Inner Experience,* Nelson-Hall

C. Durham, *Temptation: Help for Struggling Christians,* InterVarsity Press

E. S. Gaustad, ed., *A Documentary History of Religion in America to the Civil War,* Eerdmans

M. Green, *The Day Death Died,* InterVarsity Press

E. Griffin, *Getting Together,* InterVarsity Press

R. Hein, *The Harmony Within: The Spiritual Vision of George MacDonald,* Eerdmans

P. Kreeft, *Between Heaven and Hell,* InterVarsity Press

D. M. MacKay, *Science and the Quest for Meaning,* Eerdmans

C. H. Malik, *A Christian Critique of the University,* InterVarsity Press

B. Milne, *Know the Truth: A Handbook of Christian Belief,* InterVarsity Press

C. Ohlrich, *The Suffering God,* InterVarsity Press

R. E. Patterson, *Science, Faith and Revelation: An Approach to Christian Philosophy,* Mercer University Press

E. H. Peterson, *Traveling Light: Reflections on the Free Life,* InterVarsity Press

Q. L. Quade, ed., *The Pope and Revolution: John Paul II Confronts Liberation Theology,* Ethics and Public Policy Center

J. A. Shelly, *The Spiritual Needs of Children,* InterVarsity Press

J. R. W. Stott, *Between Two World: The Art of Preaching in the 20th Century,* Eerdmans

Swihart and Brigham, *Helping Children of Divorce,* InterVarsity Press

G. A. Wagner, *Business in the Public Eye: Reflections on the Ethics of Business,* Eerdmans

Second, the author seeks to show that the "negative conscience" often leads not to faith in God, but to several patterns of "religious behavior," which are directed primarily at relieving the guilt that is at the basis of the negative conscience. These patterns are developed and illustrated, and include avoidance, reassurance, fear masquerading as good behavior, and casuistry (rationalization). In each, the renewing and regenerating force of the positive conscience is operating only minimally, being significantly overshadowed by the negative conscience.

Third, Nelson argues that a true faith in God develops from an "inversion" of the power of the negative and the positive conscience. Renewal is possible with the positive conscience more in control because it is expansive and more open to education and rational control. However, true inversion must move the person to "an emotional attachment to Christ which will yield a desire and motivation for righteousness as the specific way to avoid being ashamed, a major motivator for the positive conscience." The author affirms the uniqueness of historic Christian faith (a unique object: God; a unique goal: communication with God; and a unique program: righteousness). Further, he asserts that the inversion characterizing true Christian faith can come only by God "breaking through to give individuals a new lease on life and a concern to change the society in which they live." Nelson closes by quoting Ephesians 2:8-10. While this might seem to leave humans nothing to do, he makes several practical suggestions regarding how to expedite growth in faith. These suggestions can serve as important guidelines to Christian educators.

The book is well written and well organized. The author uses numerous examples of normal and (sometimes) of abnormal behavior to illustrate his points, both in and out of the church. Further, he draws adequate support for his views from the Scriptures and from various psychological theorists. While the flow of thought is fairly straightforward, this reviewer did experience some confusion toward the end of the book. In particular, a reorganization of the material of inversion might have increased clarity. In spite of these difficulties and the limitations mentioned earlier, the book is well worth reading and applying to concrete, practical ways.

Reviewed by Steven P. McNeel, Bethel College, St. Paul, Minnesota.

BETWEEN FAITH AND TEARS by Kenneth E. Schemmer, Thomas Nelson Publishers, Nashville, 1981, 131 pages. $3.95.

The format of this book divides the eleven chapters into three sections and follows each chapter by a series of questions appropriate for individual and group study. The first section deals with the author's sickness and healing, the second with six autobiographical accounts of sickness, and the third with the author's analysis of sickness from a Christian perspective.

The book is intended to bring a message of hope, but to quote E. Stanley Jones in reference to illness, "the final result depends on how we take it." The book is depressing at times, as people describe how life has gone wrong for them. The overall impact of the book, however, is one of faith and hope. The viewpoint presented is a kind of Christian Stoicism, i.e., suffering is ultimately for our good and God's glory.

The author's goal is to help the reader transcend tragedy when it strikes personally or hits a loved one. His confidence is that through faith in Christ the believer can find the resources to overcome whatever tragedies life brings. While there is no new ground broken in explaining the traumas of life, this book illustrates the overcoming faith with which Christians have faced tragedy. The same peace and joy they experienced is offered to all those who find meaning in the Christian faith in this valley of tears called life.

Reviewed by Richard Ruble, John Brown University, Siloam Springs, Arkansas 72761.

CHRISTIANITY CHALLENGES THE UNIVERSITY, by Peter Wilkes, editor, Downers Grove, Illinois: Intervarsity Press, 1981, 98pp., $3.95 paper.

This little book is the record of an effort made by five believing professors at the University of Wisconsin, Madison, to communicate their faith in Christ to their University community. They had been meeting regularly for prayer and felt called to make a public statement of their fatih. The book consists of a brief introduction and the texts of the five lectures they presented on successive Mondays in the Great Hall of the Memorial Union during the lunch hour.

The titles of the lectures give a clear idea of the content of the book. They are: "The Christian World View—A Radical Alternative", by Peter Wilkes, Professor of Nuclear and Metallurgical Engineering; "Man: Naked Ape and Nothing More?", by Wayne M. Becker, Professor of Botany; "Christian Doubts About Economic Dogmas", by J. David Richardson, Professor of Economics, "The Reliability of the Scriptural Documents", by Keith Schoville, Chairman of the department of Hebrew and Semitic Studies, and "Christianity, Modern Medicine and the Whole Person", by A.A. MacKinney, Professor of Medicine. The book concludes with an invitation, presumably given at the end of the fifth lecture, by Wilkes, to seriously consider the radical alternative of Christianity

and to begin by reading the Gospel of John.

The reader should not expect comprehensive treatments of any of the subjects in this book. These were public lectures and intended to be challenging overviews and not the ultimate treatments of individual topics. For this reason, each chapter is followed by a short bibliography of works that cover the subject in greater depth.

What is here is an intelligent presentation of the Christian world view and how it approaches certain subjects of particular interest to thinking men and women. The Christian world view is presented as a radical alternative to secular humanism. Both Wilkes and Becker contrast their presuppositions (God, man created in God's image, fallen man redeemed by Christ, etc.) with those of Jacques Monod as expressed in his book *Chance and Necessity,* catching him neatly as he falls into secular humanism's *is/ought* trap of the basis of morality. In a world that happened by accident there is no such basis. In a world created by a Holy God there most certainly is.

Well, *ought* one to read this book? I certainly think so. It is worthwhile as a brief introduction to some issues important to intelligent Christians, but its chief value lies in the example it records of the public witness of five of our brothers. I close with a quote from Peter Wilkes' introduction:

> When it was all over we came to the conviction that what we had done could be done at any university. When a group of professors, including distinquished scholars, takes the opportunity to speak out in the university, others will listen. We acknowledge that the step was a small one, but it is our hope that by many such small steps the journey to the kingdom may be made.

Reviewed by Robert H. Seevers Jr., Department of Chemistry, Argonne National Laboratory, 9700 S. Cass Ave., Argonne, Illinois 60439.

CIRCUMSTANTIAL EVIDENCE by John Penter, Faraday Press, 1487 Noe Street, San Francisco, CA 94131 (1981). 144 pp. $11.95.

It is good for Christians to get hold of a book like this once in a while, a book whose purpose is to parade all the reasons why Christianity should be rejected. It could be profitably used in mature discussion groups to help clarify the faith. The greatest danger is that it may make Christian apologists overconfident! Here is every anti-Christian cliché of the past few hundred years, presented as the reasoned summary of modern wisdom and knowledge. We are told that the author "devoured more than 900 books, giving equal time to apologists and skeptics." In an Epilogue he tells us his own purpose: "I am not attacking religion...I have no quarrels with religious people...Religion should remain private." The book suggests otherwise; it misses no opportunity to argue against the validity of the Judaeo-Christian faith.

In six chapters the author discusses the basic subjects of the origin of religion, the proof of God's existence, the universe and its origin, miracles, Jesus Christ, and the consequences of religion itself. It is written in a very easy to read style, consisting of fictional dialogues between the author and such characters as Archaeologist, Historian, Mentor, Astronomer and Biologist, as well as Josh McDowell, Thomas Paine, Julian Jaynes, St. Anselm, Gaunilo, St. Thomas Aquinas, Leibniz, Kant, Hume, Mortimer Adler, William Paley, Einstein, Henry Morris, Alan Hayward, C.S. Lewis, Andrew Dickson White, William Nolen, Albert Schweitzer, Bertrand Russell, and Katharine Tait. Lest the inclusion here of prominent Christian apologists should seem misleading, the author assures us himself: "This book is by no means a balanced treatise...I only want to bring out what is not generally known—what we have not been told, yet should have been." The jacket blurb confirms this: "In uncomplicated language he cuts through legend and myth, probing into the sources and reliability of the Old Testament, the philosophical proofs for the existence of God, miracles, our real knowledge of the life of Jesus and the development of Christianity."

In the discussion of the origin of the Judaeo-Christian religion, a learned Historian assures us that the religion of the Old Testament, like all early religions, stemmed from fear of the environment. Yahweh, we are told, "was initially just one of many gods. He was the god of lightning and war and received human sacrifice, especially first-born male children." Moses, it turns out, really "was an Egyptian priest who went along" with the Israelites when they left Egypt "as a missionary." Josh McDowell is allowed on the scene at this point to protest, but he is quickly put to route by Thomas Paine who presents some commonly known instances in the first five books of the Bible where information is given that indicates other authors than Moses alone. This information is sufficient to silence the fictional McDowell, who "got up and walked away." The Historian goes on to assure us that "almost all of the stories in the Pentateuch can be traced to earlier civilizations...We have known this for a hundred years." Having thus demolished the authenticity and reliability of the Old Testament, Penter offers instead the theories of Julian Jaynes as the most likely *real* explanation for the origin of religion: the occurrence of schizophrenic hallucinations that were interpreted as revelation from the gods.

The rest of the book continues at this same level. The author warns the unwary reader of the philosophical sophistication of the chapter on philosophical proof, but the argument is simply based on the abstract nature and ultimate insufficiency of the "classical proofs" for the existence of God. It is amazing how persistently the naive thinker clings to the notion that being unable to prove the existence of God is somehow a damaging weakness—not realizing that it is impossible to prove *anything* in or outside science beyond formal logic and mathematics.

After treating the reader to a lengthy summary of mod-

ern scientific ideas about the origin of the universe, the learner Astronomer holding the floor bursts out,

> Why would God single out this insignificant planet? If God made man the center of creation, why would he create the universe and then wait 15 billion years to create man? And why would he create man several million years ago, but not contact him until 3500 years ago? And why does this contact coincide with the start of writing? And why is there all this violence in the universe?...And why is the story of creation so wrong in Genesis of the Old Testament?...And why is the story in Genesis so much like one an ancient, ignorant man would imagine the universe to be?

This sophomoric outpouring of questions is biblically responded to in what is perhaps the oldest book of the Bible, Job; implicit in the questions is the assumption that the judgment of the questioner takes precedence over all else.

The naivete of the author is nowhere so evident as when he encounters Einstein (a fictional Einstein, of course). Einstein tells him, "Ah, here is a serious flaw in the teachings of both Judaism and Christianity. If you say that God is omnipotent, has created everything, yet rewards and punishes us, he would be passing judgment on himself, wouldn't he?" The author's response is astonishing: "I had never thought about that." He leaves Einstein, "a sad old man," who missed the boat on modern science because he would not accept a statistical approach to the universe "mainly because of (his) belief in the existence of God." Einstein had rejected a personal God, but his remnant religion still did him in, we are to believe.

The classical argument from Design can be expected to meet its fate at the hands of the theory of evolution, and it does. Worse than that Christianity is blamed for holding up the beginnings of modern science; "For more than 1600 years after the beginning of Christianity scientific progress was at a standstill." Falling victim to the usual fallacy that the development of a biological description makes a theological description invalid and unnecessary, the learned Biologist tells us that "a reasonable explanation for the entire existence of life without having to resort to the existence of God," is now at hand.

It is no surprise that Henry Morris is dismissed quickly, and even C.S. Lewis's defence of miracles is discounted as circular reasoning, for which the traditional argument of Hume is much more compelling. Of course much is made of Andrew Dickson White and his well-known one-sided discourse in *The History of the Warfare of Science with Theology in Christendom,* and in fact White is the only "witness" called upon to appear twice in the book. The credibility of miracles is given its coup de grace when the author treats faith healing, psychosurgery and other such parapsychological phenomena as obviously bearing on the same question.

One might hope that the treatment of Jesus Christ himself might be spared this one-sided myopic treatment, but all such hope is quickly dashed when the chapter starts with the unquestioned acceptance of the opinion of Schweitzer that "In the gospel of John, Jesus is a freely imagined person. This gospel is almost entirely legend. Luke is very doubtful wherever it goes beyond Mark and Matthew. And in Matthew the first two chapters are almost certainly fiction." Schweitzer concludes, "What is important about Jesus is the amount of influence over mankind his doctrine of love has won. It is the spiritual and ethical truth of Christianity that has remained the same throughout the centuries, not dogma." A Critic is then allowed to run rampant through the gospels, interpreting every departure from absolute literal identity between the gospels as evidence of error. The celebrated passage in Josephus about Jesus is dismissed as an obvious insertion "later by a rather inept Christian." The Critic then proceeds to give his own life of Jesus. He introduces it with the words, "My story will contain guesses, inaccuracies, my own bias, I admit it; but my story comes much closer to the truth than what we are still being taught in countless religious books and from the pulpit every Sunday." He is able to categorically conclude that Jesus certainly was not the son of God, because he was mistaken about the time for the end of the world.

As a final nail in the coffin of historical Christianity, the author turns to the excesses of religion and lays them all at the door of Christianity. His first witness is none other than Bertrand Russell, whose anti-Christian convictions are well known, although less well known is the naivete of his reasons. He denounces the concept of "righteousness," for example, because then there must also be "unrighteousness," which according to Russell (a la Penter) is "simply behavior of the kind disliked by the majority." He also argues that "In the Christian view the virtuous man is one who retires from the world." Finally White reappears to make his major summation of the fact that "Christianity has retarded the progress of mankind greatly." Every controversy of history is given its simplest misinterpretation. Granted the abundant errors perpetrated throughout history in the name of Christianity, the case for Christianity, deserves better than that provided by the Defender in this mock trial stage by Penter. "The judge looked at the Defender, who had his elbow propped on the table, supporting his chin with his hand. After a few seconds he said: 'No questions.' " The Prosecuter continues for several pages, finally arriving at his climax, "During the time when the Christian religion reached its peak of influence, Europe was a hell-hole!" The Defender lamely tries at this point to reply in one paragraph about all the good that Christianity has done, arguing that Christianity should not be blamed for merely human folly. But the prosecutor will have none of it. "It is not human folly I object to, but human folly—committed in the name of God!"

The value of this book lies in the fact that it summarizes the popular philosopher's attack on Christianity. It is the very stuff that characterizes the everyday cultural presuppositions of a secular society, which has been misinformed, misled and misguided in its concept of Christianity. The challenge is to face up to these arguments and show the flimsy historical and philosophical base upon which they stand.

Reviewed by Richard H. Bube, Department of Materials Science and Engineering, Stanford University, Stanford, California 94305.

Founded in 1941 out of a concern for the relationship between science and Christian faith, the **American Scientific Affiliation** is an association of men and women who have made a personal commitment of themselves and their lives to Jesus Christ as Lord and Savior, and who have made a personal commitment of themselves and their lives to a scientific description of the world. The purpose of the Affiliation is to explore any and every area relating Christian faith and science. The *Journal ASA* is one of the means by which the results of such exploration are made known for the benefit and criticism of the Christian community and of the scientific community.

A closely affiliated organization, the **Canadian Christian and Scientific Affiliation,** was formed in 1973 with a distinctively Canadian orientation. The **CSCA** and the **ASA** share sponsorship of the publication. **CSCA** subscribes to the same statement of faith as the **ASA** and has the same general structure. However, it has its own governing body with a separate annual meeting in Canada.

Members of both organizations endorse the following statement of faith: (1) *The Holy Scriptures are the inspired Word of God, the only unerring guide of faith and conduct.* (2) *Jesus Christ is the Son of God and through His Atonement is the one and only Mediator between God and man.* (3) *God is the Creator of the physical universe. Certain laws are discernible in the manner in which God upholds the universe. The scientific approach is capable of giving reliable information about the natural world.*

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