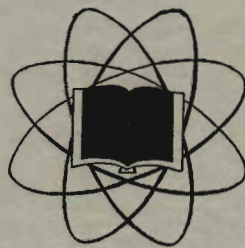


# JOURNAL

*of the*

## AMERICAN SCIENTIFIC AFFILIATION



*The fear of the Lord is the beginning of wisdom. Psalm 111:10*

Volume 6

June, 1954

No. 2

# The American Scientific Affiliation

(INCORPORATED)

The American Scientific Affiliation was organized in 1941 by a group of Christian men of science. The purpose of the organization is to study those topics germane to the conviction that the frameworks of scientific knowledge and a conservative Christian faith are compatible.

## PUBLICATIONS

*The Journal of the American Scientific Affiliation* is issued quarterly. Its contents include primarily subjects both directly or indirectly related to the purpose of the organization, news of current trends in science (including sociology and anthropology), and book reviews.

*Modern Science and Christian Faith*, is a 316-page book containing ten chapters on nine fields of science, each written by a person or persons versed in that field.

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No. 1. *Christian Theism and the Empirical Sciences*, by Cornelius Jaarsma, Ph.D. A 10-page booklet. "The data of the sciences are given their true structure when integrated in the unity of Christian thought based on revelational presuppositions."

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No. 3. *The Eye As An Optical Instrument*, by Frank Allen, Ph.D. A 16-page illustrated booklet discussing the intricate marvels of the eye.

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# The Journal Of The American Scientific Affiliation

Vol. 6

JUNE, 1954

No. 2

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## News Notes

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Announcement has recently been made of a new book on "Noise" by **Aldert van der Ziel**. Published by Prentice-Hall, it covers such topics as thermal noise, noise in semi-conductors, and mathematical treatments, to mention only a few. Dr. van der Ziel has published a number of articles recently on this general subject and has contributed a chapter in Volume IV of "Advances in Electronics".

An article discussing "Divine Healing and Miracle" by **Philip Marquart** appeared in a recent issue of the Christian Medical Society Journal. Various types of healing are considered in the light of Scriptural precedent and present day significance.

"Man's Creation is not a Myth" by **William J. Tinkle** was published in the Gospel Messenger of April 3. This brief article includes a concise explanation of the differences in attitudes between creationist and evolutionist.

**D. Lee Chesnut** and his talks on the atom and the Word of God was the feature subject in the May 9 edition of Power. This publication is produced by Scripture Press for use primarily in Sunday Schools.

Dr. Francis C. Frary was honored at the recent Kansas City meeting of the American Chemical Society, for fifty years membership in that organization. Dr. Frary formerly served as director of research and now is a consultant to the Aluminum Company of America.

Saturday, May 15, the executive council of the A. S. A. met at the Sherman hotel in Chicago. All members of the council, with the exception of Brian P. Sutherland were present. Among the matters discussed was that of the revision of the constitution. It was decided that a session of the annual meeting at Harrisonburg, Virginia be devoted to the topic: "The aims and objectives of the A.S.A."

A local meeting of the Indiana-Illinois section of the A. S. A. was held at the home of Arnold C. Schultz in Chicago Saturday afternoon May 15. At that time Delbert N. Eggenberger discussed the subject: "The age of the universe". An interesting open discussion followed. Refreshments were served by Mrs. Schultz.

(More News Notes on page 12)

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## New Members

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**C. Markham Berry**, 520 Wabash Ave., Atlanta, Georgia, is Assistant Resident at Grady Memorial Hospital in Atlanta. He received his pre-medical

training at Emory University, and holds the M.D. degree from Emory University School of Medicine.

**Martin C. Eby**, R. 2, Mohnton, Pa., is supervisor of manufacture at Althouse Chemical Co., Inc. of Reading, Pa. He has a B.S. in Chemical Engineering from Lehigh University.

**Leland R. Harper** is treasurer and business manager of The Missionary Training Institute, Nyack, New York. Received the A.B. degree from Asbury College, and did some graduate work in education at University of Georgia and Oglethorpe University.

**Richard A. Hendry**, 1206 East Haley St., Santa Barbara, Calif., is a Teaching Fellow in the Biochemistry Department, Baylor University College of Medicine. He holds a B.A. from University of California, M.A. from the College of the Pacific.

**Edward J. Matson** is Assistant Director of Research at Abbott Laboratories, North Chicago, Ill. A graduate of Wheaton College, he received the M.S. and Ph.D. degrees from University of Illinois. Home address is St. Mary's Road, R. 1, Box 150D, Libertyville, Ill.

**James S. Pinneo** received his M.D. from Temple University Medical School, is surgical resident at Episcopal Hospital, Philadelphia, Pa. He also is a missionary appointee under Central Alaskan Missions, Inc.

**Homer C. Riggs**, 37 Cheever Circle, Andover, Mass. is president of Riggs & Lombard, Inc., Lowell, Mass. Holds the degree of B.T.E. from Lowell Technical Institute.

**Elver Voth**, 1136 N. Ainsworth St., Portland, Oregon. He received both the A.B. and Th.B. from Cascade College.

**Hugh William Wilson**, Osgoode, Ontario, Canada, is Assistant Research Officer in the National Aeronautical Establishment. Holds the B.Sc. degree from Queen's University.

**Wayne U. Ault** is a student and research assistant at Columbia University, Professor of Physics at Shelton College. Has a B.A. from Wheaton College, M.A. from Columbia. Address: Lamont Geological Observatory, Palisades, N. Y.

**David C. Foster**, 1106 N. West St., Wheaton, Ill. is also an alumnus of Wheaton College. Employed as a chemist with the Lindsay Chemical Company, West Chicago, Ill.

**Arthur F. Glasser** is a professor at Columbia Bible College, Columbia, S. C. Holds degree of C.E. from Cornell U., B.D. from Faith Theological Seminary. Served six years as missionary in China. Home address, 390 19th Ave., Paterson, New Jersey.

**James A. Green**, 5208 Petty, Houston, Texas. A graduate assistant in the Biology Department at Rice Institute, received his B.S. from Abilene Christian College.



**Jared W. Haslett** is a Research Fellow with the Armour Research Foundation. Has a B.S. from Wheaton College; home address, 115 N. Main St., Wheaton, Ill.

**Kenneth M. Heatwole** is a staff physician at Blue Ridge Sanatorium, Charlottesville, Va. A graduate of Goshen College, he received his M.D. from Medical College of Virginia.

**J. Harold Housman**, 1134 Pine St., Philadelphia, Pa., is second year student at Jefferson Medical College. Has bachelor's degrees from Eastern Mennonite College and Lebanon Valley College.

**Wilbur Vance Johnson**, 2511 Dana St., Berkeley 4, Calif., is a student at University of California. Has B.S. from University of Washington.

**James H. Kraakevik** is a physicist in the Naval Research Laboratory, lives at 3636 Horner Pl., S.E., Washington 20, D. C. Graduate of Wheaton College, and candidate for Ph.D. at University of Maryland.

**Ivan W. Lageschulte**, 103 W. Harrison Ave., Wheaton, Ill., is owner of the Lageschulte Electric Shop, Barrington, Ill. Has a Sc.B. degree from Wheaton College.

**Melvin E. Loptson** is a graduate student at Columbia Bible College. Has a B.A. from Wheaton, M.A. from Columbia Bible College, looks forward to service as a missionary among the Moslems. Home address: 851 W. Euclid Ave., Stockton 4, Calif.

**Riley McBee**, 339 E. Belmont, Phoenix, Arizona, is a mathematics and science teacher in the Glendale High School. Has a mechanical engineering degree from Purdue University.

**Frank L. Marsh** is a professor at Emmanuel Missionary College, Berrien Springs, Michigan. He has two bachelor's degrees from this school, M.S. from Northwestern University, and Ph.D. from University of Nebraska. Resides at 395 Grove Ave., Berrien Springs, Mich.

**John Rea**, Box 126, Winona Lake, Indiana, is assistant professor in Bible and archaeology at Grace Theological Seminary. Holds degrees from Princeton University, Grace Theological Seminary and Wheaton College.

**Anthony J. Stecca** is a section head in Naval Research Laboratory. Has a degree in electrical engineering from Ohio University, taking part-time work at University of Maryland toward his master's degree. Home address: 5303 Valley Road S. E., Washington 27, D. C.

**Laurence C. Walker**, P. O. Box 311, Brewton, Alabama, is a research forester employed by the U. S. Forest Service, Southern Forest Experiment

Station. Has B.S. degree from Pennsylvania State College, M.F. from Yale University, and Ph.D from New York College of Forestry.

**Dean I. Walter**, 3634 Horner Place S.E., Washington 20, D. C., is head of the Analytical Chemistry Branch, Naval Research Laboratory. Received the B.S. degree from Juniata College. Also serves as pastor of Vicksburg Brethren Church, Duncansville, Pa.

**Byron E. Blair**, 2802 Elnora St., Silver Spring, Md., is employed as a physicist and head of Physical Tests Unit of the Bureau of Mines, College Park, Md. He has a B.S. degree from Wheaton College.

**Walter Carrell** is a Development Engineer with the U. S. Army, at Dugway Proving Ground, Dugway, Utah. He also is a Wheaton College graduate.

**T. Gilbert Dunkin**, 1260 Vista Drive, Port Credit, Ontario, is employed by A. V. Ree Canada, Ltd., manufacturer of aircraft and engines, as contracts officer and technical assistant to sales manager. B.S. from Wheaton College.

**Paul C. Davis** is Associate Professor of Psychology at Roberts Wesleyan College, North Chili, N. Y. Received the A.B. degree from Seattle Pacific College, M.A. and Ph.D. from University of Southern California.

**James M. Murk** is a teacher at Bob Jones University, Greenville, S. C. Received degrees from Bob Jones, University of Chicago and University of Minnesota. Is preparing for the mission field.

**Erwin B. Nase**, 509 Walnut St., Perkasio, Pa., is serving in the U. S. Army, Baltimore District, as construction engineer and construction inspector. Has a B.S. degree from The Penna. State University, State College, Pa.

**Edwin A. Olson** is an instructor in Chemistry at Northwestern Schools, Minneapolis, Minn. Both B.S. and M.S. granted by University of Pittsburgh. Home address: 3236 3rd Ave. So., Minneapolis 8, Minn.

**Albert C. Strong**, Box 127, Addis Ababa, Ethiopia, East Africa, is a pastor-missionary under the Sudan Interior Mission. Graduate of University of California and Fuller Theological Seminary.

**William M. Swyter**, Box 4588, Bob Jones University, Greenville, S. C. teaches at the same institution where he received the B.A. and M.A. degrees.

**Edward C. Trivette**, graduate student and teaching assistant at Washington State College. Has the A.B. degree from Wheaton College, M.S. from Washington State. Home address. Baldwin, Maryland.

# A Christian Philosophy of Science\*

HENRY WEAVER, JR., Ph.D.

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Elkhart, Ind.

## I. Introduction

### 1. The Need for a Christian Philosophy of Science

In the last fifty years the science and technology of America and the world have made tremendous advances. With the release of nuclear energy man has put himself in the vulnerable position where it appears his technology may destroy himself and his achievements. This startling situation has made many non-Christian men aware, for the first time, that science needs religion and morality to control it. It is further recognized that a religion which would control scientific technology must be one which can connect itself in some way with contemporary science. Despite all contentions that Christianity is incapable of doing this, the purpose of this discussion is to show the relation of Christian principles to scientific fact. This view is opposed to that of modern Protestantism, which holds that moral philosophy and religion are autonomous subjects, independent of natural science.

### 2. The Basic Types of Science

Perhaps the greatest reason for so much loose thinking about the relations of science and religion is the failure to recognize that science consists of two distinct parts. One part of science is the formal element. This consists of logical deductions which yield a consistent theory. The question formal science asks is, "Can it be proven by logic?" Nonformal science on the other hand asks, "Is it actually true?" Religion has a different relation to each type of science, and we shall consider each one separately.

## II. Formal Science

Formal science consists of a system deductively formulated by the laws of logic. The formal part of any one science builds on the concepts of simpler sciences. This means that the sciences can be arranged in order of their complexity.

Such a listing follows:

- Logic (which introduces the basic laws)
- Mathematics (which introduces the ideas of numbers, equalities, lines, etc.)
- Physics (introducing the concepts of time, motion, mass, electricity, etc.)
- Chemistry (introducing the valence concept)
- Biology (adding the terms life, animal, plant, etc.)
- Psychology (with the concept of mind and intelligence)
- Sociology (dealing with groups of people)
- Religion (adding the ideas of ethics, God, etc.)

While this list is not comprehensive it shows that in

the formal sense, religion may be treated as a science. In fact if a religion wants to show itself scientifically correct, and intimately connected with science it must be considered as a science in the formal development.

If we were to arrive at a religion by pure reason alone, we would no more end up with Christianity, then we would arrive at the physics of Newton, Planck, or Einstein by reason alone. It must be admitted that all the sciences beyond logic are colored in their formal fabrication by non-formal truth. One of the new concepts Christianity presents to formal science is ethics. This means its formal development must differ from that of preceding sciences. We can tolerate any view, for example, of physics or chemistry that is logically developed in formal science. However, in Christianity, as a formal science, we must reject any idea or postulate of a preceding science which can be proven to be actually false. As long as we cannot know definitely that a certain postulate is false, we may include it in our formal scheme of Christianity. It should be pointed out that the basis of Christianity is the Bible. Dr. Machen<sup>1</sup> has well established the case that a religion not accepting the Bible has no right to be called Christian. Using the Bible, and any actually true scientific theory, formal Christianity can be developed in a relationship that is intimately connected with modern science. On issues where neither the Bible nor non-formal science speak, the Christian may well have views that will be constantly subject to change, and that must be kept, at all times, up to date. This explains in part why different Christian theologies exist. As long as they accept actual known truth, including the Bible, all that is required is that they be self consistent. If these conditions are met, one Christian theology is just as valid as the next as far as formal development is concerned.

## III. Non-formal Science

### 1. Methods of Determining Truth

In formal science the only restriction on the choice of postulates is that they be consistent and independent. In non-formal science we attempt to determine whether a given proposition is in reality true. The philosophy of non-formal science is chiefly concerned with the method used to establish truth. Historically there are four common methods:

- 1) Dogmatism, which involves appealing to some external authority, either written or verbal. The weakness of this method is the lack of a criterion to

\*Paper presented at the Eighth Annual Convention of the American Scientific Affiliation, Winona Lake, Indiana, September 1-3, 1953.

determine the correct authority. If some more basic method is used to determine the correct authority this method is generally considered acceptable.

2) Intuitionism. This is the ascertaining of truth through an inner realization of its validity. This seems to lie mainly in the imagination. If one cannot imagine a thing it does not mean it is not true. A person in the tropics may not be able to conceive of such a thing as frozen water, but that does not preclude its existence.

3) Rationalism, which is finding the truth entirely by the use of the laws of logic. It has never been able by its own laws to show that it is a basic method of determining non-formal truth.

4) Empiricism. By a modern definition, empiricism is a method of employing sensory experience to determine truth. Since the time of John Locke (17th century), this method of finding truth has been accepted, with a few important limitations. Unfortunately these limitations are often not understood by those who advocate the use of the empirical method. Let us examine them closely.<sup>2</sup>

a) Only controlled experiments are of value in determining scientific truth. The results of such experiments give us the answer which lies closest to the truth. This restriction to empiricism answers the objection of the experimental scientist that our senses often play tricks on us. For example, how can one be sure he does not see an optical illusion instead of what actually exists? Consider the case of twenty people reporting on an automobile accident that they all witnessed. The contradictions found, readily convince us that controlled experiments are required. Granting controlled experiments, we still arrive only close to the truth. Consider the historical question of the length called the meter. Originally scientists determined the meter as the length that is one ten millionth of the distance from a pole of the earth to the equator. They put this length on a special platinum-iridium bar as a standard. Later, more accurate measurements showed the bar to be not quite one ten millionth of the distance above. A scientist today in measuring something will get many readings. They will not all agree. By a procedure known as the "method of least squares" he concludes what answer is nearest to the actual measurement—but he does *not* conclude his answer to be the actual measurement.

b) The empirical method assumes the validity of certain fundamental entities, and then either confirms or disproves them. This problem, originally raised by Kant, is quite significant. Stated another way, we might say we always assume our equipment to be accurate. The equipment may be physical equipment or something more abstract. For example, we assume the laws of arithmetic to hold without ques-

tion, or we accept the principles of logic. By making these assumptions, we do not exclude the possibility of showing them wrong. In nuclear physics, certain Euclidian geometry propositions, when presupposed, lead to contradictions, and therefore must be rejected. If our assumptions, or physical equipment lead to consistent results, we have no reason to doubt that we have arrived at the truth by empirical means.

c) No Law of Science can ever be reached that is entirely free of doubt. This consideration proposed by David Hume must be considered valid. That is, the job of the scientist to establish absolute truth, or undoubted laws is an ideal one. It can never be completed in any finite time, because to be absolutely valid it must hold for all cases. To show it holds for all cases by empirical means requires us to examine an infinite number of cases! We cannot conclude, however, that a scientist's work is therefore of less value than if he established absolute truth. What is found is the most probable truth. While the scientist cannot say his conclusion is undoubtable, he can say, upon the use of the empirical method, that his conclusion is more likely true than any other. That is, his conclusion has the highest probability of being correct. This is not to be confused with the physicist's statistical probability. For example Newtonian physics, or classical physics, was accepted as about as absolute as anything ever has been. However, modern physics has shown that certain parts of Newton's physics, while valid for all other cases tested, did not hold when very small atomic particles were considered. A specific example would be this: In classical physics there is the law of conservation of matter which says that matter may not be created or destroyed. However, modern physicists have found that a photon, which has no mass, but does have energy, can change into a positron and an electron both of which have mass! This is a case in which matter has been created. We have changed our views to believe in a law of conservation of mass-energy. The point is this: Science can establish something with a very high degree of certainty, but it never says the particular conclusion it holds may not be wrong.

## 2. The Scientific Method

At this point let us summarize the modern scientific method. This is sometimes presented as consisting of three steps: Hypothesis, theory, and Law. The hypothesis is the formal part of the method. Science first of all formulates a logical proposition that it wants to test. This is sometimes called the problem. The second step is the non-formal part. The empirical method is used to arrive at an answer to the problem. On this basis a probable solution, the theory, is determined. Finally, when the theory has stood the test of time, it is called a law. The difference between a theory or law

is not distinct or of much importance. A law is simply a theory with an added degree of probability.

### 3. The Scientific Method and Religion

A vital and debated question today is this: Can the scientific method be used to establish facts about religion? One school of thought says that before the empirical method may be used to find religious truth, it must by empirical means, show that it is valid for that use. If they ask for undoubtable empirical evidence, they must admit that the empirical method cannot produce that proof for any type of truth. This does not however, invalidate the method. If we assume the method to be applicable to metaphysical ideas, we find the results consistent, and therefore this contention is groundless. Fundamental theologians have contended that religious truth is of a higher nature than science. The reaction of many scientists to this has been most unfortunate. If religion must be pigeon-holed in a class where their usual reasoning is not applicable, it has no appeal to them. Certainly both have a point. From a science point of view, metaphysical problems lie beyond direct sensory experience, but so do atoms. The major problem is how to determine a factor which lies beyond the physical senses. The answer is by inference. The difficulty which now arises is how one can distinguish between a faulty inference and a valid one. To a scientist the only correct means is the scientific method, which has already been outlined. By this method one can arrive at the logical conclusion that atoms exist, and by this method an equal amount, indeed a larger amount of evidence is produced to show the existence of God. In other words, in the same sense that the existence of atoms can be proven, God can be proven. However, it must be remembered that by "proven" is meant simply that a high probability of correctness is attached to it.

The theologian's point must also be considered. He chooses for example, to believe in God regardless of what science says. His belief must be an absolute belief. It is not enough to believe God almost certainly exists; one must believe, without a doubt, that He exists. In that sense, religion is above reason and the scientific method. In the final analysis religion requires faith. Notice the nature of faith, however. Faith is not believing something contrary to all scientific evidence, but it is believing something that scientific evidence points toward; something that is beyond the end of the pointing finger. Christian faith is essentially dogmatic. It is accepting a concept because of the reliability of the authority presenting it. On the other hand faith must not be thought of as something that bridges the gap between the end of evidence and the unknown. Faith is coexistent with evidence. One must have faith in God where it is backed by reason, and where the probability of His existence is not certainty.

In answer to the question, "Can the scientific method

be used on religion?" we believe that at least the fundamental assumptions of Christianity can be established by the scientific method as surely as any other natural truth. However, we believe that this is not sufficiently sure for the Christian, and therefore he must in addition, have faith.

### 4. The Place of Christianity in Non-formal Science

Previously it was shown that in formal science religion in general presupposes all the more fundamental sciences. In non-formal science however, the situation is reversed. Other sciences are merely a part of the overall plan of God. God revealed Himself through nature and His Word. Actual truth comes from God. He is the origin of all we have.

### IV. Conflicts Between Science and Christianity

In the past, conflicts between Christianity and science have been met in a number of ways:

a) State that Christianity and Science deal with different areas of truth, and therefore, may have existing conflicts.

b) Contend that no conflict is possible.

c) Accept science, and reject that part of Christianity which conflicts, or all of Christianity.

d) Accept Christianity always, and reject that part of science which conflicts.

e) Assume that no contradiction is possible and therefore look for a possible fallacy in the conclusion that a conflict exists.

The conclusion of this paper is that method a) and b) are illogical solutions, while any of the last three are possible solutions. We have already considered the argument of a). The contention of b), that a conflict is impossible, is a failure to face reality. Those who hold this contention probably do not realize that there are conflicts within science and within Christianity. Why should there not be conflicts between the two? It has just been pointed out that science and Christianity are each just a part of the whole plan of God. Therefore, we should deal with conflicts between these just as we would with conflicts between two scientific ideas, or two Christian ideas.

The first step in solving a conflict is to use method e). i.e. look for a fallacy in the reasoning which claims that a conflict exists. Many conflicts are only apparent because of ambiguous terms, or because of a misunderstanding of either science or Christianity. For example, the contention that science conflicts with the Bible, because science shows that apples could not grow in the part of the world where the garden of Eden was located, and yet the Bible claims Eve ate an apple, is easily solved. The Bible does not say Eve ate an apple. Whether or not apples could have grown there is no longer even pertinent. If the conflict appears to be real, we can either change science or Christianity. Consider first how science might be changed. To illustrate we will use an example in which one part of science



conflicts with another part. Physicists have shown that what is known as the special principle of relativity is a valid principle of physics. That is simply stated, that suppose certain physical phenomenon obey laws relative to a certain reference point, (e.g. the earth) they will also obey the same laws relative to some other reference point which is in uniform motion with respect to the first. For example, suppose some big box were traveling at the rate of ten miles per second with respect to the earth, toward a light source on the earth. The same physical laws should hold with respect to the box or the earth. There is another law of physics which states that the velocity of light does not depend on the velocity of the source of the light. That is to say the velocity of light is always 186,000 miles per second. Notice now, that if the first principle is true the velocity of light should be 186,010 for a person in the box. The principle of relativity and the principle of the constancy of the speed of light are clearly in conflict. To solve the conflict we must merely adopt for the theory of relativity the concept of relative time. That is the length of the second is not the same in both of the above systems. The point is, if we can make necessary changes in science to solve conflicts within science, we can do likewise to solve conflicts between science and Christianity.

On the other hand there are conflicts within Christianity, too. Some of these are easily solved. For example, John 19:14 says Christ died at the sixth hour, while Mark 15:25 says it was the third hour. The conflict is readily solved by discovering one was using Jewish time, the other Roman time. A more puzzling conflict would be this: God is love, yet God will punish man by hell fire because God is Just. This is a conflict. How can God be love and yet be just? The conflict is answered in Christ. God's love devised a means of allowing man to escape punishment.

Consider this case. Some Christians contend the Bible predicts a thousand year reign of Christ on the earth. Others contend the Bible does not predict that. Obviously both cannot be right and the conflict will not be properly answered until Christ comes. This is the important point, however; many things in our Christian viewpoint are interpretations of the Bible. Let it be granted the Bible as originally given is without error or need of change, but if science empirically proves something which our interpretation of the Bible contradicts, we should consider changing our interpretations. Of course, the Christian will never take the view that a problem between science and Christianity requires him to abandon Christianity.

## V. Conclusion

Science in its rapid advance needs Christianity to control it. Christianity based on the Bible, is scientifically sound, and adequate to meet the needs of our pres-

ent world. God produced both, His laws control both, and between the two exists complete harmony.

1. Machen, *Christianity and Liberalism*
2. G. W. Churchman, op. cit. *Elements of Logic and Formal Science*, p151ff

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## PROGRAM

**Northeastern Regional Meeting of the American Scientific Affiliation, at Shelton College, Ringwood, New Jersey, March 27, 1954**

2:00 p.m. Panel Discussion: Christian Philosophies of Science.

Moderator:

J. Laurence Kulp, Ph.D., Associate Professor of Geo-chemistry, Columbia University.

Discussants:

J. Oliver Buswell, Jr., Ph.D., President, Shelton College.

John F. Gates, S.T.D., Chairman, Department of Theology and Philosophy, The King's College.

Thomas H. Leith, Ph.D., Chairman, Department of Physical Sciences, Gordon College.

Karl Turekian, M.S., Lecturer in Geology, Columbia University.

The discussion will be relevant to the immediate context of the purposes and constitution of the A.S.A. Various recently stated positions will be contrasted and compared in an attempt to arrive at some agreement as to the minimal essentials of a Christian philosophy of science.

3:30 p.m. Group Discussion: The Aims and Purposes of the A.S.A. Chairman:

Donald R. Carr, M.S., Associate Professor of Geology, Shelton College.

5:45 pm Dinner A brief business meeting will be held at the table immediately after the meal

8:00 p.m. Miscellaneous Reports.

Chairman: William W. Paul, M.A., Chairman, Department of Philosophy, Shelton College.

The Impact of Synthetic Fibers on the Woolen Industry. Werner Von Bergen, Director of Research, Forstmann Woolen Company.

The Significance of the Piltdown Hoax.

James O. Buswell, III, M.A. Assistant Professor of Anthropology, Shelton College.

Some Therapeutic Implications of the Physiological disposition of certain drugs.

Arthur Schulert, Ph.D., Professor of Biology and Chemistry, Shelton College.

Recent Work Among the Bulu of the French Cameroun. George R. Horner, Dr. d'Un. en Lettres (Sorbonne).

Recent Results in Geologic Age Determination. J. Laurence Kulp, Ph.D., Lamont Geological Observatory, Columbia University.

# The Idea of Christian Scientific Endeavor in the Thought of Herman Dooyeweerd\*

ROBERT D. KNUDSEN, Th.M.

Just 27 years ago, in the year 1926, Dr. Dooyeweerd assumed his professorship at the Free University of Amsterdam. He had already had experience as a successful lawyer, and in seeking the theoretical foundations of his own field, he was driven to broader ontological and epistemological questions. The result was his effort to develop a distinctively Christian philosophy, which has come to be known as the Philosophy of the Idea of Law. This system is deep and thoroughgoing and it demands the attention of the Christian philosopher. It is of significance for the Christian working in the special sciences as well as to the Christian philosopher especially since it was conceived while Dooyeweerd was grappling with the problems of jurisprudence and since it has always sought fruitful contact with the special sciences.

Other thinkers are associated with this movement, men of no mean philosophical ability; however, I have chosen to limit myself to the philosophy of Dooyeweerd himself because of limitations of time and also because I believe his thought is especially significant for us in America as we try to develop a Christian approach to scientific endeavor. I shall then outline Dooyeweerd's position as it bears on the problem of Christian scientific thought.

In everyday life, Dooyeweerd says, we have a living contact with concrete reality in its manysidedness. The world with all its aspects is experienced in its wholeness and undividedness. The various sides of reality are not articulated. This attitude of naive experience is not a theory about reality, a *naïve realist* theory of knowledge. We only develop theories when we assume the theoretical attitude. This attitude is quite different from that of naive experience. In it we create a distance between logical thought and one of the aspects of reality. In theoretical thought these aspects, which are unarticulated in everyday experience, are abstracted from the unity of cosmic time and are set over against each other as the fields of investigation for the special sciences, such as biology, physics, and psychology.

That there are various aspects of experience may become clear if we use an illustration. Let us suppose a fruitgrower has a shipment of apricots which he wishes to sell to a cannery. He meets with the cannery agent to talk business. This agent has \$1000 in bills, which he will use to pay for the shipment. These bills

are *physical* things, which have various symbols printed on them. Now the fact that the cannery agent has bills with the face value of \$1000 does not determine the economic worth of these bills. He plans on paying this sum, while several years before the shipment might have been worth only \$500. The apricots are of the same quality and quantity, but inflation and devaluation have decreased the buying power of the dollar. But we are not finished. The apricots themselves are not simply valued at an absolute figure. The cannery can take perhaps only a portion of the grower's apricots because its market is not large enough to handle all the fruit produced in this good season. If no market for the other apricots can be found they are economically worthless, and they will be allowed to rot on the trees and fall off. The *location* of the apricots is also of significance. If the orchard is far removed from the cannery and the consumer the apricots will be less valuable than those of a grower who is more conveniently located. Without going into a full analysis of the problem we see at least that *economic value* is something different from the face value of money and the apricots as physical objects. In order to see the real value one must look beyond the things that are the most obvious, the physical apricots and the dollar bills. When our seller and buyer have agreed on a price and have signed a *legal* document many factors have come into play. What we wish to note is that in this short sketch we have already distinguished a *physical*, an *economical*, a *spatial*, and a *legal* aspect of reality. Dooyeweerd now differentiates fifteen aspects of the Cosmos: the mathematical, the spatial, the physical, physical effect, the biological, the psychological, the logical, the historical, the linguistic, the social, the economic, the aesthetic, the legal, the moral, and the pistic. In every concrete act all these aspects are included in some way or other,<sup>1</sup> though in naive experience they are not theoretically distinguished.

In theoretical thought these aspects are articulated, abstracted from the unity of cosmic time, and they become the fields of investigation for the special sciences. In the theoretical attitude, therefore, there is an abstraction from full, concrete reality. Theoretical thought is characterized by "... an *antithetical relation* in which the *logical aspect of our thought* is opposed to *non-logical aspects of reality*."<sup>2</sup> In this antithetic relation the non-logical aspect presents a *problem*, which offers

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1. Dooyeweerd, *Transcendental Problems of Philosophic Thought*, p. 30. (Hereafter designated, TPPT.)

2. TPPT, p. 29.

resistance to solution. The non-logical aspect stands over against thought and offers resistance to it as its *Gegenstand*. In this relation the theoretical problems are first raised, which are met in the special sciences.

Philosophy is also theoretical in character. It is broader than the special sciences, however, and lies at their foundation. Dooyeweerd defines philosophy as *theoretical thought directed to the totality of meaning of our cosmos*.<sup>3</sup> While the special sciences limit their attention to the variable phenomena within particular aspects of reality philosophy investigates the nature of these aspects in their diversity and mutual relationships.<sup>4</sup> This unity can be found only by referring to the origin of the cosmos. Dooyeweerd says that the cosmos is *meaning*. By this he intends to express the insufficiency of the cosmos with relation to its origin. No aspect of the cosmos is sufficient to itself. Each part points beyond itself and finally to the origin. There is an inner restlessness in all being, which Augustine expressed in his famous saying, Thou hast made us for thyself and our soul is restless until it find its rest in thee. Philosophy seeks on the theoretical plane this direction to the origin. It is thought *out* and *to* the origin. All philosophic thought is led by a transcendental idea of the origin, unity, and the relation of the aspects of the cosmos. This idea Dooyeweerd calls the *Wetsidee* (Idea of Law), the term from which his philosophy gets its name.

Philosophy is not external to the special sciences. It is not bare speculation apart from sober investigation of the facts. It is not merely a summa of the results of the special sciences. In order to get a clear idea of any field of investigation it is necessary to see it in its relationship to the other sciences. This is not merely a luxury, but is necessary for successful scientific endeavor. A deep study of any special field must lead to philosophical questions.

At the core of Dooyeweerd's Christian philosophy is his transcendental critique of thought. He uses the term "transcendental" in the sense Kant used it, to refer to the direction of thought which seeks the theoretical foundations of its own possibility. Dooyeweerd claims, however, that he has put the critique of thought on a broader and deeper basis than did Kant. Though he initiated a critique of thought Kant was dogmatic and uncritical in his starting point.<sup>5</sup> The problem of Kant is that of all *immanence philosophy*, which seeks to proclaim the autonomy of theoretical thought as the starting point of philosophy. It does not allow that thought be influenced by revelation. It sees no problem in the theoretical attitude itself, but seeks there the starting point which it assumes is the only guarantee for a truly undogmatic and critical way of thought.<sup>6</sup> But

Dooyeweerd sees an inner problem in the theoretic attitude itself. His critique is directed at theoretic thought itself, seeking its presuppositions.

There is room for a true transcendental critique only when "... in a radical-critical attitude we can fix our *theoretical thought itself* on its necessary *presupposita*, ... which are postulated by this structure."<sup>7</sup> Presupposita differ from the subjective *presuppositions*, which are the subjective view of the presupposita, and which vary from system to system. The presupposita are the *universal* and *necessary* conditions of theoretical thought as such.

That there is a problem hidden in this theoretical attitude is seen, Dooyeweerd says, from the fact that it has been conceived of in different ways. For instance, in Greek metaphysics *theoria* was presented as the way to the true knowledge of Divinity in contrast to the popular *pistis* (faith) and *doxa* (opinion).<sup>8</sup> In Thomist thought *theoria* was conceived as a natural base for the higher supernatural knowledge of revelation, and *pistis* was conceived as a gift superadded to the natural reason. To say that theoretical thought is autonomous is to fail to see its problematic character which makes it unsuited to be the starting point for a critique of thought.<sup>9</sup>

As we saw, Dooyeweerd claims that the theoretic attitude is characterized by an antithetic relation between the logical and particular non-logical aspects of reality. We also saw how the various aspects of reality are linked in the hierarchy of cosmic time, and that only in the theoretic attitude are they abstracted and become a *Gegenstand*. Now the central question in Dooyeweerd's investigation of thought is this: From what standpoint is it possible to apprehend in a synthetic view the various aspects of the cosmos which are articulated in the theoretic attitude?<sup>10</sup> In answering this problem immanence philosophy is inescapably involved in an embarrassment. It takes theoretical thought as its unproblematic starting point; but by its very nature theoretical thought is bound to the non-logical aspects of reality. It must effect a theoretical synthesis; however, there are as many possible theoretical syntheses as there are aspects of reality. One can have a synthesis of a biological nature, a psychological nature, etc. Because it takes its starting point in theoretical thought immanence philosophy will be forced to elevate one aspect of the cosmos, a particular synthetic view, to the absolute *arche* of all the rest. Dooyeweerd sees this embarrassment as the true source of all the *isms* in philosophy, which war against each other and which seem irreconcilable by purely theoretical debate. In the *Lebensphilosophie* as it expresses itself in Bergson in the opposition of the living force (*elan vital*) and the petrification of conceptual thought

3. Dooyeweerd, *De Wijsbegeerte der wetsidee*, I, 6.

4. Dooyeweerd, *Inleiding encyclopaedie der rechtswetenschap*, p. 13. (Hereafter designated, IERW.)

5. TPPT, p. 20.

6. IERW, p. 15.

7. TPPT, p. 25.

8. TPPT, p. 23.

9. TPPT, p. 24.

10. TPPT, p. 36.

we find an absolutization of the biological aspect. In Leibniz, with his application of the infinitesimal calculus to the realm of philosophy, we find an absolutization of the mathematical aspect. These *isms* are by no means limited to philosophy; they crop up also in the exact and empirical sciences. Among the mathematicians we have the formation of opposing schools, according to whether the thinkers find the origin of mathematics in logical thought, sense perception, and intuition of time, or a complex of linguistic symbols arising from convention.<sup>11</sup> One's position with respect to these problems determines one's appreciation of whole branches of mathematics.

The elevation of one of the aspects to the absolute *arche* involves an attempted reduction of the other aspects to it. This can take place with a show of success because the aspects are really related to each other. But just because of this interrelatedness the false absolutization of one evokes the protest of the others and thought is enmeshed in the theoretical *antinomies*. These are a study in themselves. We can mention, however, the famed antinomies of Zeno. Dooyeweerd says that these are the result of the attempt to reduce *motion*, which is the central meaning of the physical aspect, to *space*, and that thought of as a series of infinitely small mathematical points. It would be truly impossible for Zeno's arrow to move if the meaning of motion were to traverse an infinite number of spaces. However, motion has its own meaning, which is irreducible to space and number.

Synthesis of the logical with non-logical aspects of reality is possible because the aspects are not divorced from each other but are related in cosmic time. But for the possibility of theoretical thought we need also a transcendental idea "... of the deeper root unity of the distinguished aspects, an idea which can be gained only when we choose our standpoint above their theoretical diversity."<sup>12</sup> "The starting point, the Archimedean point, that first makes the theoretical synthesis possible, must lie per se above the theoretically articulated aspects."<sup>13</sup> Dooyeweerd says that this standpoint can be found only in relation to the *self*. Self knowledge is necessary for a true transcendental critique of thought. It is one of the presupposita of theoretical thought. Kant also realized the necessity of this direction to the self, and through it he tried to find a standpoint above the *isms* of philosophy. However, he found this point in what he called the transcendental unity of apperception, the *I think* which accompanies every act of thought but which can never become the *Gegenstand* of any possible experience. But this self is not the concrete self which thinks, but is merely the subjective pole of the antithetic relation. If one takes his starting point in the logical there is no way of bridg-

ing the gap between the logical and the non-logical aspect.<sup>14</sup> The starting point must be above both the logical and the non-logical aspect if one is not to be absolutized at the expense of the other, and the theoretical attitude is not to be annihilated.<sup>15</sup>

The self which transcends the poles of the antithetic relation is not the *I think*, but the concrete self which acts. Knowledge of this self is necessary for the transcendental critique. But self knowledge is never possible in a purely theoretic way.<sup>16</sup> Self knowledge is necessary for theoretical thought, but it is not gained by theoretical thought itself. This is apparent in that self knowledge is always correlative to knowledge of God.<sup>17</sup> By an inner law of its own nature, which Dooyeweerd calls the "religious concentration law", self knowledge seeks its divine origin.<sup>18</sup> Theoretical thought is not apart from self knowledge, nor is self knowledge apart from a religious commitment as to the origin, the unity, and the relationship of the various aspects of reality. All philosophy is led by such a transcendental idea (*Wetsidee*) which though theoretical in character is religiously conditioned.

The starting point of philosophy can not be purely individual. Dooyeweerd finds that the superindividual starting point is the religious root-community of humankind, in which the individual has a part, but which is of superindividual character. The self is not isolated but exists within a community, which is ruled by a motive force which brings it into being and gives it its form. Dooyeweerd distinguishes four such communities and motives in our Western world: 1) the motive of form and matter which dominated Greek thought; 2) the Christian motive of creation, fall, and redemption; 3) the motive of nature and grace, which found its high point in the thought of Thomas Aquinas; 4) the motive of nature and freedom, which rules modern humanistic thought. Behind all the logic and systematizing of the philosophers these fundamental motives are at work. Kant's distinction of the theoretical and practical reason, for instance, is not just the result of logical reasoning, but is the expression of the covert dualism in the religious motive ruling his thought, that of nature and freedom.<sup>18</sup>

Dooyeweerd finds all of these motives except the Christian one to be composed of two antagonistic motives which battle against each other. Modern humanistic thought is dominated by the motive of *nature* and freedom. Nature is the sphere of the externally conditioned. Freedom is man's self-determination. The ideal of science is to construe experience as a concatenation of causal relationships; but this leaves no room for the self-determination of free personality. In our country this problem comes to very clear expres-

11. TPPT, p. 39.  
12. IERW, p. 14.  
13. IERW, p. 14.

14. IERW, pp. 14-15.  
15. IERW, p. 14.  
16. TPPT, p. 55.  
17. TPPT, p. 53.  
18. TPPT, p. 24.

sion in the thought of Reinhold Niebuhr, especially in his earlier writings.<sup>19</sup>

Thus, according to Dooyeweerd, theoretical thought is not autonomous. It is carried and formed by the motive of one or the other religious community. It is only the Christian motive which can give an integral view of reality, because it has a starting point in which it is possible to account for the origin, diversity, and the relation of the various aspects of the cosmos.

The claim that theoretical thought is not neutral but is dependent upon a religious commitment is of immense significance. It would provide an integral, internal relation between faith and scientific endeavor. It opens the way for a *Christian* scientific activity. If theoretical thought is neutral with respect to the Christian faith, then it is not possible to have *Christian* scientific endeavor. There is then but personal Christian faith and neutral scientific attitude. If an internal relation between the Christian faith and scientific endeavor exists it will be possible to have science also under the kingship of Christ.

But does not the idea that science is religiously conditioned open the door to a flood of subjective prejudices that would destroy the objectivity of scientific endeavor and erase the possibility of fruitful communication between opposing positions? That such might happen is undeniable. But Dooyeweerd says that such would be a misunderstanding of the true nature of his critique. He claims that thought, while obeying the most rigid canons of procedure, must come to the conclusion that it has necessary religious commitments. The recognition of these presuppositions does not destroy the critical character of thought. That the critical investigation of thought is dependent on a super-theoretic starting point would injure its scientific character only if thereby a really scientific problem should be eliminated by an authoritative dictum.<sup>20</sup> His critique shows, that thought which refuses to recognize its religious presuppositions and which holds to the independence of theoretical thought is dogmatic and uncritical in its starting point. Failure to see the religious root of thought has resulted in a fruitless battle of the various *isms* in philosophy, without the possibility of true communication between the opposing systems. Only when the source of the mutually destructive *isms* is uncovered is there again the possibility of fruitful contact between systems.

In stressing the antithesis between Christian and non-Christian also in the realm of *theoria* Dooyeweerd follows in the footsteps of Abraham Kuyper. We should not interpret their views of the religious apriori subjectively, however, as if the Christian investigator were to come simply laden with subjective prejudices. Such would really destroy the scientific character of

his effort. But to establish the fact that a true critical investigation of thought uncovers a religious apriori in all thought opens the way to establishing an organic relationship between faith and science. The way is then prepared for showing the fruitfulness of the Christian world view for science.

Seeing such an organic connection of faith and science will save the Christian from various pitfalls. It will free him, in the first place, from binding science to the proof of the Bible. The Christian is sincerely interested in the trustworthiness of the Scriptures, and he will be engaged in defending them from unbelieving attacks. He should not, however, confine the meaning of science to the support of Biblical passages. Whether or not it is their conscious intent, many orthodox Christians give the impression that this is all that science means to them. The Christian must establish the possibility of working at the sciences from a distinctively Christian point of view. He must in a positive way try to show the fruitfulness of the Christian world view for scientific effort. In the second place, it will save Christians from using scientific information just to find analogies to spiritual truth in nature. That there is some analogy between nature and the Christian life may be supposed from Christ's use of parables from nature. However, it is a mistake to assume that the "Christian" in Christian scientific endeavor is the discovery of some such analogies, perhaps *vestigia trinitatis* in the structure of the universe. In the third place, it will save the Christian from assuming that there is a neutral factuality that can be grasped and understood alike by Christian and non-Christian. A neutral factuality is almost bound to push religion back into the corner of the subjective. On the other hand, to see an organic connection between faith and science will make the Christian faith fruitful in every aspect of life, subjecting all to the kingship of Christ. The Christian can deepen himself in the sciences with the confidence that the earth is the Lord's and the fulness thereof.

Dooyeweerd does not see *theoria* as the sole way to truth and to true humanity, as did the Pythagoreans with their idea of the *bios theoretikos*. He does not degrade naive experience into an impossible theory of reality. In naive experience we encounter reality as it is *given*. It is the theoretical attitude that is strange to reality, because it breaks the original unity of the cosmos and seeks to regain it again in a theoretical synthesis. There are many activities in a developed culture for which theoretical activity is necessary, however. Theoretical thought itself is a deepening of thought as used in everyday life, and it is an instrument in the development of culture. Though it is not the calling of all Christians, it is a necessary task for the Christian community. Some members of the Christian community, who have been endowed with the particular gifts for thought, should engage in theoretical

19. See his, *Does Civilization Need Religion?* pp. 6, 19, et passim.

20. TPPT, pp. vi-vii.



activity on a distinctively Christian foundation. This will be one form of obedience to the command to subdue the earth. As the secrets of God's universe are unlocked, and as its potentialities are developed, there will be a testimony to the honor and glory of Him by whom, through whom, and to whom are all things, in heaven and on earth.

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### NEWS NOTES

(Continued from page 2)

Dr. Hawley Otis Taylor was born in North Derby, Vermont, on June 4, 1876. His father was a sculptor; an artistic heritage that Hawley expressed in his beautiful drafting. Hawley's brother, Almo, who survives him, is an artist, working principally with newspapers.

Hawley's early interest in science began as a draftsman for the copper mines at Jerome, Arizona. Shortly after this he went to stay with his brother, Almo, while attending Rochester College. At his brother's home Hawley met Harriett and was married to her in 1917. After receiving his A.B. from Cornell in 1909 he continued there as a graduate student and teaching assistant, and later as an instructor. He received his Ph.D. at Cornell University in Physics in 1913. His

thesis dealt with acoustics.

Dr. Taylor first entered the field of Christian Education in 1924 as a Physics professor at the John Brown University. The following year he, also, performed the duties of Dean. He came to Wheaton in 1927. In 1928, he became Chairman of the Department of Mathematics and Physics, and held this position until his retirement in 1947. Mrs. Taylor, also, taught in Wheaton. Coming to Los Angeles in 1947, he accepted the position of Professor of Mathematics and Physics and later Dean and Registrar of the Ambassador College.

Mrs. Taylor went home to her Lord in the spring of 1953. One year later, on March 31, 1954 Hawley was called to his eternal rest. His quiet cooperative spirit made him a favorite in any home in which he was a guest. He was alert and active in his field to the very end. His last paper was published in 1953 on *The Tube Method of Measuring Sound Absorption*. He belonged to many scientific societies. He was a loyal supporter of the local church, and of the missionaries in the far away places, many of whom were his students. Hawley Taylor is at home with his Lord Jesus Christ, but he is still here in the lives of those who have been blessed by him.

# Genetic Evidence As to the Color of Adam and Eve\*

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All of us have at times wondered as to the appearance of our original parents, Adam and Eve. Frequently, students ask, "What was the color of Adam and Eve?" This paper is an attempt to answer this question from our present day knowledge of genetics, race characteristics, and the nature of pigmentation in the human skin.

Pigmentation in animals has been shown to be the result of chemical changes directly related to the presence of certain genes. The genes control an enzymatic system which controls the development of pigment and the degree of pigmentation possible. The action of the ultraviolet rays of light influences the amount of pigment finally attained upon exposure to light. This knowledge of the relation of genes to the pigmentation in mammals is adequately presented by Hovanitz in his recent 'Textbook of Genetics'.<sup>1</sup> The multiple factors and multiple alleles controlling the coat color of rodents is well known from the work of Castle, Dunn, and Wright. Our knowledge of the relation of genes to human pigmentation is fragmentary. The Davenports in their studies of pigmentation of Negro-White crosses in Bermuda concluded that there were two pairs of multiple factors for pigmentation of skin due to melanin.<sup>2</sup> This is generally accepted today with the possibility of there being additional factors or that the factors may be multiple alleles. Sterns in discussing the matter states, "this does not mean that no other hypothesis can be formulated which may explain the observations equally well, or even better. It may be assumed, for instance, that three pairs of cumulative, equally potent, allelic pairs,  $A^1, A^2, B^1, B^2, C^1, C^2$ , are involved. This hypothesis would yield more genotypes than the two-factor hypothesis. . . . Moreover, it is probable that each locus may be represented not by two but by multiple alleles."<sup>3</sup> Boyd suggests that there are other genes for the carotene pigment present in the skin.<sup>4</sup> Thus our knowledge is surely imperfect. It should be pointed out that albinos occur among people of all races and skin color. Further, it is known that most albinos are recessive mutations to the normal pigmentation. The genes for pigmentation are quantitative and cumulative in their action. Crosses between a Negro and a White (Caucasian) result in pigmentation which is intermediate (Mulatto) for we do not have typical

dominance and recessiveness of gene action expressed.

The origin of the present day differences in pigmentation of the human races must have taken place since the time of appearance of the first man on earth. Evolutionists support the thesis that all the races of man have developed from a common ancestor by mutations and selection of the occurring mutations. This has been recently depicted in *Life* (Vol. 34, No. 20, May 18, 1953 p. 101-106). According to the Scriptures, the differences arose since the time of Noah. The most reasonable explanation of the origin of the differences of pigmentation is that of mutational changes and the resulting isolation of the differences by geographical and climatic factors.

A consideration of our knowledge of gene mutations leads us to believe that the mutations of skin color have been from the darker to the lighter coloration. Most gene mutations have been in the direction of the dominant gene to the recessive. In the case of multiple alleles, the mutation of the gene may be in either direction. Also a mutated gene may change back to the original gene. Snyder states, "A recessive trait may be common or rare in a population, depending upon whether the recessive mutant gene is common or rare. This in turn will depend upon the past history of the population in terms of mutation, selection, migration, system of mating, and population size."<sup>5</sup> The present day population of the world has a far greater proportion of dark skinned individuals than white. Also consideration of selection, migration, and system of mating favor the predominance of dark skinned individuals. Since the genes for pigmentation of skin do not react as simple dominance and recessiveness, we can not accurately trace the mutations which occurred. A consideration of the mutant genes affecting coat color in rodents indicates the change from the dominant to the recessive and from the gene producing a dark pigment to a gene producing a lighter pigment. From our meager knowledge of the relation of genes to enzymes, it is reasonable to conclude that the mutations of genes would be such that less enzyme or a modified enzyme would be produced. The mutation of a gene to one which does not produce pigment (albinism) is understandable in the terms of a gene which does not produce an enzyme or one which inhibits the action of another enzyme. Since most human albinos are results of recessive genes, it seems feasible that the

\*Paper presented at the Eighth Annual Convention of the American Scientific Affiliation, Winona Lake, Indiana, September 1-3, 1953.

mutation of the genes for pigment have been from the genes producing the most pigment to genes not producing any pigment. This does not preclude that genes might not mutate back from the lighter to the darker pigmentation, and such might be possible. From our insufficient knowledge as to the chemical nature of the gene, it is questionable that the genes for darker pigmentation could arise from genes for lighter pigmentation which would necessitate the formation of new genic material to produce the enzyme increasing pigmentation. The most reasonable possibility for the occurrence of mutation of the genes controlling pigmentation seems to be from the darkest to the lightest and finally absence of pigmentation.

In addition to consideration of the problem of the direction of mutation, and their origin, we must recognize the rate of occurrence of the mutation, probability of survival, and mutation pressure. That mutations in the human might be established within a period of about 6,000 years from the time of Noah would point to a much greater frequency of occurrence than is common today in known human mutations. Even selection of the mutant gene does not seem to be great enough to account for the population differences observed today. I would conclude that the present differences in pigmentation as found today in the world's population have not been a result of mutations in recent time. Also that the changes must have been sudden and probably supernatural. That is, God at the time of the tower of Babel scattered the descendants of the sons of Noah and at the same time or soon afterwards caused the changes in pigmentation to occur and which continue to the present time. (Genesis 11:1,9)

Since God uses natural laws in His dealings with man, it is possible that the changes in pigmentation took place by mutations in a great frequency. Also from our present knowledge of mutations it seems

likely that the mutations occurred from the darker pigmentation to the lighter pigmentation. Therefore Noah and his ancestors, including Adam and Eve, were dark-skinned individuals. I should hasten to add that this does not mean that Adam and Eve were Negroes, for there are several other physical characteristics other than pigmentation which characterize the Negro race.

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#### CORRECTION:

The following was in a letter from Paul Jewett, forwarded to us by J. L. Kulp.

"I noticed the other day that the A.S.A. has carried over into the second edition of its book the motto, "In essentials, unity; in non-essentials, liberty; in all things, charity," as a statement of Augustine. This sentence occurred for the first time in Germany in 1627 and 28 and has recently been traced to a tract written by an otherwise unknown German divine, Rupertus Meldenius. I would suggest that, in the interests of "scientific" accuracy, he be given the credit if there is a reprint. For the whole story, see Philip Schaaf, Vol. 7, *Modern Christianity*, The German Reformation, page 16 ff."

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## ABSTRACTS

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"A Christian Obligation" O. R. Johnson, M. A. *The Christian Graduate*. March 1954, pp. 2-6

Using the key word *think* of Philippians 4:8 the author cautions the Christian that it is his duty to do so. The all-too-common shift from reason to emotion after conversion is deplored. He advocates a study and appreciation of science, as well as of history and other endeavors, as leading to a greater knowledge of the wisdom and majesty of God.

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"The Christian Approach to Culture" Rev. J. I. Packer, M.A. *The Christian Graduate* March 1954, pp. 6-12

This article constitutes a rather thorough review of the book of the same title by Emile Cailliet.

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"The Christian Student and General Culture" Dr. J. Dengerink (The Free University, Amsterdam) *The Christian Graduate*, March 1954, pp. 13-18.

The author poses the question "Should our cultural activity and our evangelistic work be sharply separated?" The negative answer is considered in the light of Biblical requirements of man. The Christian should be active in every good work: arts, sciences, technologies, politics, education, etc. He calls for an elimination of dualism, e.g. not a Christian and a teacher, but a Christian teacher.

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"Causation" Dr. E. Roland Dobbs. *The Christian Graduate*, March 1954, pp. 43-46.

The thinking of philosophers of the past on the problem of casualty is summarized by Dr. Dobbs before making his own conclusion. Considerable change in viewpoint has taken place since Aristotle, who considered all acts must have a cause and therefore he arrived finally to a first cause of a perfect God. Thomas Aquinas was an apt disciple of Aristotelian proofs of God, but William of Ockham tempered this thought with one of a probable first cause in God but the acceptance of such was an act of faith, not proof. Francis Bacon then completely separated philosophy and revealed theology. The author sums up the trend with his conclusion that God is not expected to be found by mechanical causal linke.

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"The Lutheran Reformation" Prof. J. H. S. Burleigh. *The Christian Graduate*, March 1954, pp. 48-52

A quite dispassionate survey of the Luther's reformation with particular reference to the political implications in Germany, is presented.

"The Soul and the Soil" Rev. Otto Gruber. *Intelligence Digest Supplement*, Feb. 1954, pp. 55-57 (Reprint from Think)

The pastor of the First Presbyterian Church, Los Angeles, calls attention to the fact that we are responsible for caring for the land and resources as a sacred trust. Joshua's report of the Promised Land was "a land flowing with milk and honey," a marked contrast to the semi-desert conditions of today. He points out that God never promised his people barren lands for an inheritance; to waste, or allow to waste, is a sin against God.

The *Intelligence Digest Supplement* is running a number of articles on farm conditions and soil conservation with plans for a survey of individual countries and their programs for conservation and efficiency.

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"An Intellectual Journey" Charles H. Craig *His*. Feb. 1954, pp. 12 ff.

This article is concerned with the topic of why so few educated people are Christians. The author traces is, not to faulty reasoning, motive, or intelligence, but to a faulty initial premise. This fault stems from a lack of information on Christ and the foundations of the Christian religion.

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"Some Limitations of Science" D. C. Spanner, Ph.D. (Reprint from *The Christian Graduate*). *His* Feb. 1954, pp. 24 ff.

A clear appraisal is presented as to why science is necessarily materialistic, while scientists' motives may not be. This position is supported by history. He points out that "It is because we make the logical fallacy of bringing in God to close the gaps in our scientific knowledge that the rationalist so often laughs at us." Science may close the gap, with another retreat for religion. He concludes that a new faculty, faith, is required to perceive and understand the Christian religion.

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"The Age of the Universe" D. ter Haar. *The Scientific Monthly*. October 1953, pp. 173-181.

Those interested in this fascinating subject will find here a comprehensive summary of the various methods used and the results of each. It is somewhat humiliating to find that Christians for centuries were espousing a 6000-year old earth while the ancient Hindus calculated that the earth was created 1,972,949,055 years ago. The author discusses briefly four methods for estimating the age of the earth, one involving the moon, and six involving stellar bodies.

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## ANTHROPOLOGY

by

James O. Buswell, III, M.A.

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### Africa

In the January, 1953 issue of *Eternity*, Dr. Donald G. Barnhouse made the statement that "to me, the situation in Africa is the most important event in world history for the year 1952. . ." Since then the various situations arising out of the juxtaposition of African and European culture have become of extreme importance not only to Africa alone, but to the rest of the world as well. It is for this reason that this vast culture-contact situation has been chosen for discussion here as the most significant anthropological problem to which the attention of Christian people might profitably be drawn.

It must be kept in mind in connection with what follows, however, that the African situation is one of complexities, seen and unseen, all sides of which are by no means apparent to even the most experienced observer. Nevertheless, there are important aspects which we find eminently worthy of attention, particularly that we might pray for the Christian missionaries who are in the midst of a very perplexing situation with conflicting demands upon their loyalties of a very strenuous nature.

There have been, since World War II, many developments in Africa of a truly progressive nature. The achievement of independence by Libya, the setting up of an African controlled constitutional government in Gold Coast, the uniting of Eritrea with Ethiopia to their mutual benefit, and the scattered but continuous improvement in African educational institutions in many parts, are only a few. The optimistic outlook for the eventual independence and self control of the Sudan has been partially a product of a completely new and unprecedented regime in Egypt. The ultimate goals and direction of this regime may still be, in a measure, obscure, but it can confidently be said, at least, that now they are going somewhere.

The major trouble areas, with the exception of the nationalistic ferment in the northern French provinces, are in the British territories of East and Central Africa, and in the Union of South Africa.

The most violent unrest is the bloody campaign against white occupation in Kenya by members of the Kikuyu secret society known as the Mau Mau. It is significant to note in passing that there are two segments of the Kikuyu tribe which outstandingly oppose the Mau Mau activities. They are, on the one hand, those who have been truly converted to Christianity, and on the other, those who still firmly believe in their

old tribal religion. The Mau Mau organization is notoriously a sham of the old tribal fears and ritual, playing upon those who are partially acculturated and cut loose from the old sense of values and economic and kinship ties, but who have not become converted to genuine Christianity. Nevertheless some of the motives for this senseless campaign are far from imaginary.

The consensus of informed opinion seems to indicate that the core of the Mau Mau problem is the land situation. Most of the farmers in the native reserves are hopelessly overpopulating the allotted land which is able to be cultivated. Of the 52,000 square miles where the Africans are allowed to hold land in Kenya, only about 9200 square miles, or 1/25th of Kenya's land is productively arable, of the remainder, which comprises nearly two thirds of the Colony, most of the land is unarable because of forest, mountain and desert conditions, and supports a population of less than one per square mile.

The land set aside for whites, on the other hand, amounts to over 12,000 square miles of the very best land in the colony. There are about 30,000 Europeans in Kenya, three times as many Indians, and 5,251,000 Africans, according to 1948 figures.

This land distribution problem alone would be serious enough, but it is complicated by the fact that native Africans of this area once owned parts of the land since alienated to the Whites exclusively by the colonial government. There was individual and family ownership of estates with specific boundaries, quite different from the commercial ownership concepts traditionally attributed to all primitive peoples. This fact was misunderstood by the English settlers and colonial administrators who parceled out the land for white occupation shortly after the turn of the century. It was held that any unoccupied land would be automatically the property of those settling upon it, consequently no attempt at purchase was made according to Kikuyu custom, and payments made for land already occupied was considered by the Africans to be a form of rental only.

The tragic part of the history of Kenya's occupation is that it was not until after the first World War that most of the Africans began to realize fully that the Europeans actually believed they owned, exclusively, the land upon which they had settled. Furthermore the settlers refused to believe the facts concerning native land ownership. Although only a comparatively small percentage of the so-called White Highlands is actually disputed territory, it is the attitude and principle involved which has caused so much friction and misunderstanding.

In 1929 a Kikuyu Land Inquiry Committee reported to the government the nature of the former Kikuyu land holdings on the basis of ownership of bounded estates. And yet British officialdom maintains the



position that "The natives of this colony have no land interests in the Highlands . . . and have no rights to the land. . ." <sup>1</sup>with the time-worn explanation released by the British Information Service in February, 1953, that"

"When pressure arises on African land it is natural that Africans should regard neighboring land occupied by Europeans as the solution to their problem. The age-old African habit of meeting land congestion or exhaustion by moving on to the next piece of land not actually in cultivation leads to claims that contiguous land belongs to them, and the Kikuyu claims to the White Highlands have developed from this typical African attitude."<sup>2</sup>

Public opinion is also formed by statements of the press which allege that the Mau Mau society "is not the child of economic pressure or connected with any special grievances." Rather would they describe the outbreaks in a more popular style, such as that they "stem from the frustrations of a savage people neither mentally nor economically able to adjust itself to the swift pace of civilization. Men whose sole aim in life was to be warriors, going on forays into other tribal territories, or defending their own against attacks from their neighbors, feel cheated their normal role in tribal life."<sup>3</sup>

Such fanciful terms are no longer applicable to known agricultural peoples, not to mention the obvious error of the author's estimate of their mentality.

True, the colonial government, with great financial assistance from Britain, is spending thousands of pounds annually for specific improvements. But the spending of money will not correct the direction of policy. It is a change in basic attitudes that is urgently needed. Those evident in Kenya have applied as well to the creation of the Federation in Central Africa over the protests of the Africans, particularly those from Nyasaland. The point of view is admirably illustrated by the following quotation from a native African:

" 'We know what is good for you,' a member of the colonial administration said to me. 'Your people are not sufficiently educated to know. If they are wrongheaded enough to oppose our intentions, well, we have the power to enforce them.'"

"That is an attitude which every African resents. Frankly, it means that if we will not accept what the Colonial Office or the Ministry of Commonwealth Relations thinks is good for us, the power of the police and the army will be used to impose it upon us.

"The day has passed when official Britain can adopt this attitude."<sup>4</sup>

Shelton College  
Ringwood, New Jersey  
May 1, 1954

JUNE, 1954

1. Montgomery, in the Legislative Council for African Interests, April 13, 1944. He added "... and I hope they never will."
2. "The Situation in Kenya", British Information Service, an Agency of the British Government, Reference Division, ID 1168, Feb., 1953, p. 2.
3. Tania Long, in *The New York Times*, Dateline, London, October 19, 1953.
4. Seretse Khama, *New York Herald Tribune*, March 27, 1953.

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## BIOLOGY

by

Irving W. Knobloch, Ph.D.

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The Role of Mutation in Evolution: Before one should attempt to discuss such a topic one should, perhaps, define the term "mutation". Two definitions are used currently. One restricts the term to changes in the protein molecule known as a gene. The other definition includes not only these gene changes but any change in the individual chromosomes or in the set or sets of chromosomes in a cell. Such changes might include deletions, inversions and doubling of chromosomes.

DeVries publicized mutations with work on the Evening Primroses although such sudden appearances of new forms had been noted in other organisms earlier and had been termed "sports". Although DeVries' mutants are now thought by most biologists to have been hybrids,\* it must be said that his work gave impetus to a neglected field of inquiry.

In this necessarily brief discussion we shall restrict ourselves to the role of gene or point mutations in evolution. To prove that a mutation of this kind has occurred is really quite a difficult task, for two reasons. One reason is that a large number of organisms, if not all, are quite heterozygous for many characters and one must eliminate the effects of crossing and recombination in determining if a point mutation has taken place. Another difficulty concerns itself with the frequency of chromosome doubling and rearrangements in organisms. Polyploidy, for example is extremely common in plants (30-35% in angiosperms according to G. L. Stebbins—*Variation and Evolution in Plants*). New species arising by either crossing or by polyploidy cannot be logically credited to point mutations. Thomas Hunt Morgan once wrote (*Scientific Basis of Evolution*) that "a point mutation may be said to be known as such only when it has been traced to a definite locus in a known chromosome". Hagedoorn (*Relative Value of the Processes Causing Evolution*) believes that it is next to impossible to prove the fact that a real (gene) mutation has occurred.

If one were to ask a large number of educated laymen (or even teachers) to name the most important method of species formation, one would probably find

that a significant number would name "mutation." It is not known what these people understand by the term "mutation" but it is doubtful if many of them have ever heard of an alternative method of speciation. Most of the public think that genes are quite unstable and that mutations are going on at a great rate. This statement of course is not true.

Not only are the laymen mesmerized by the word "mutation" but scientists as well. A recent article on mutations in bacteria pointed this! The environment is ruled out by clever experimentation and the writer then claims that the new forms have arisen by mutation and the inference is that it is point mutation. No mention is made of the possible contributions of methods of speciation other than gene changes. The difficulty of proving a gene or point mutation has been mentioned above.

It might be advantageous to inquire as to the importance of mutations. Several scientists will now be quoted. It is to be understood that while these statements are on the cautious or negative side the writers, no doubt believe in mutation to a greater or less degree. The purpose of these quotations is to show that there may be somewhat of difference of opinion among scientists in regard to the importance of the point mutation as a powerful factor in speciation.

"Although a great many species have been studied, it must be admitted that most of them are not in a 'mutating' condition. Thus if mutation is not a general phenomenon, it can have but slight significance as a means of species formation" Arthur W. Haupt, *Fundamentals of Biology*, McGraw Hill Book Co., N. Y., 1928.

"Mutation changes one gene at a time; simultaneous mutation of masses of genes is unknown. On the other hand, species differ from each other usually in many genes; hence, a sudden origin of a species by mutation, in one thrust, would demand a simultaneous mutation of numerous genes." Theodosius Dobzhansky, *Genetics and the Origin of Species*, 2nd Ed., Columbia Univ. Press, 1941.

"It may, in short, be stated that no mutation has ever occurred in the progress of genetic work which is fully viable and behaves as a dominant to the wild-type condition. That any have given rise to changes which could be of survival value in nature appears highly doubtful". E. B. Ford, *Mendelism and Evolution*, Dial Press, N. Y., 1931.

"It is true that thus far nobody has produced a new species or genus etc. by macromutation. It is equally true that nobody has produced even a species by the selection of micromutations. In the best-known organisms, like *Drosophila*, innumerable mutants are known. If we were able to combine a thousand or more of such mutants in a single individual, this still would have no

resemblance whatsoever to any type known as a species in nature". Richard B. Goldschmidt, *American Scientist* 40(1):94, 1952.

An article by Dr. C. P. Martin of McGill University, Canada (A Non-geneticist Looks at Evolution, *American Scientist* 41 (1):100-106, (1953) touches on some of the points mentioned above. Dr. Martin concedes the possibility of gene mutations but he asserts that they are largely pathological in their effect. He might also have mentioned the fact that most mutants cannot compete successfully with their "wild" progenitors, that the viability of many mutants is low and that the majority of mutations produce only slight effects rather than large "jumps". One might also say that even in the case of genes known to be unstable (i.e. the lavender *a* gene of *Delphinium ajacis*), the change when it occurs, is from the recessive to the dominant and usually from the mutant type to the "wild" type. He does not feel that the "facts" of genetics establish the mutation-selection theory beyond all doubt. Dr. Martin is probably a neo-Lamarckianist (use and disuse). Lamarckianism has always been an attractive theory and many thousands of attempts have been made to prove the inheritance of acquired characteristics, a necessary part of the theory. Environmental effects are of course not inherited, according to the experiments, unless the genes are changed in some way. This is quite difficult to do because of the inherent stability of the gene (although chromosomes themselves may be changed or destroyed). The present reviewer cannot refrain from hypothesizing that when once the plasmagenes are understood, they may be found to be more amenable to environmental pressure than the nuclear genes.

One of the troublesome aspects of the natural selection hypothesis of Charles Darwin is the frequent and unpleasant discovery of characters which would be difficult or relatively impossible to acquire by natural selection. Dr. Martin mentions one, the distal flexure line in the palm of the hand. He asserts that geneticists would plead caution in denying the usefulness of this character—one cannot say whether a structure is useful or not as it may have a hidden or unsuspected use. Religious people invoke the same argument in pleading for the "hidden" usefulness of some vestigial structure. I do not wish to decry the argument in either case as it may, on occasion, be a perfectly valid one. I found Dr. Martin's paper quite interesting.

A good deal more could and should be said on the subject of mutation. In summary, I would like to make it very clear that I regard gene mutation as a very logical and possible occurrence but I do not think that it is, in view of the stability of the gene, as important a factor in speciation as its proponents contend. I would also like to emphasize that there are other methods of speciation such as polyploidy and hybridization and

\**Oenothera* Lamarckiana is said to be a cross of *O. biennis* and *O. franciscana*.

that a species cannot truthfully be said to "mutate" unless these other possibilities are eliminated. Some may refer me to the thousands of research papers dealing with mutations in many organisms. My position here would be that some of these justifiably refer to point mutations but in many cases the claims are dubious because the other variables in speciation have not been considered. A well-known geneticist recently told me that point mutations are assumed to have occurred after all other possibilities have been eliminated. This, I would say, is a fair statement.

East Lansing, Michigan

March 30, 1954

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## PHILOSOPHY

by

Robert D. Knudsen, Th.M.

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Those interested in the history of science will enjoy reading a review discussion by I. Bernard Cohen, "Some Recent Books on the History of Science." *Journal of the History of Ideas*, XV (1954), 163-192.

The discipline is a very young one, the author says and up to now very few universities offer a program in it leading to a higher degree. Its pioneers are such men as Paul Tannery, Moritz Cantor, Karl Sudhoff, George Sarton, Lynn Thorndike, Pierre Duhem, Charles H. Haskins, and Charles Singer.

Cohen gives considerable attention to George Sarton, professor emeritus of the history of science at Harvard university, and founder and editor until 1952 of the magazine *Isis*. Sarton is well known for his three volume, *Introduction to the History of Science* (Publication No. 376 of the Carnegie Institute of Washington). Cohen considers this work to be indispensable to anyone studying the subject.

Sarton has projected an eight volume work on the history of science. The first volume has already appeared: *A History of Science: ancient science through the golden age of Greece*. Cambridge: Harvard University Press, 1952. Of this work Cohen writes, "Never before has the whole panorama of ancient science been so displayed for the general reader in its mighty dimensions" (p 173).

Another volume by Sarton is a general survey of the literature of the history of science: *A Guide to the History of Science*. Waltham, Mass.: Chronica Botanica Co., 1952. This survey of books has been published as an appendix to the author's lectures in London on science and tradition. Among other things Sarton deals with the worthwhileness and possibility of teaching the history of science.

Cohen also reports that Charles Singer is planning

a five volume survey of the history of the development of technology. In the June, 1953, issue of this column I pointed out the importance of the problem of technology in recent discussion. Fortunately, among those concerned with the problem there are Christian thinkers, e.g., the Dutch professor, Van Riessen.

Also of interest is Cohen's report on the work of Lynn Thorndike, who is continuing his well known, *History of Magic and Experimental Science*. Six volumes have already been published, and he is now completing the volumes on the seventeenth century.

Another article that struck my attention was that of Frank E. Hartung, "Cultural Relativity and Moral Judgments." *Philosophy of Science*, XXI (1954), 118-126. For a long while I have been wondering whether the relativists should not be classed along with the Communists as fifth columnists, since by saying that all standards are relative they dull our insight into the serious nature of differences and corrode our moral fibre. It is interesting that Hartung claims that, by calling all standards equally valid, the cultural relativists have destroyed the foundations of rational judgment and have undermined resistance to the advance of undemocratic world forces.

The cultural relativists, Hartung argues, have discovered that cultures differ widely in defining certain acts as morally good or evil. From this discovery they have concluded that the customs or institutions of one culture are valid equally with those of another. The acceptance of the equal value of all cultures is urged by the relativist as an aid to objectivity and tolerance. Hartung claims, however, that the relativist fails to see the difference between cultural variation and cultural relativity. From the trite fact of cultural variation one can not argue logically that all standards are of equal value. That is to go farther and to assert that there is *cultural relativity*, and that there is no possible intercultural standard for evaluating cultural differences. Relativists (e.g., Hume, Westmermarck) make choice rest upon personal preference. The effect is to destroy the very objectivity after which the relativist is striving. If objective standards are destroyed, "... we are deprived of any rational grounds for making choices and decisions" ... and ... "the cultural relativist disarms himself against aggression by an authoritarian" (p. 125). In addition, if we cannot appeal to a standard above the diversity of cultures, and if choice is a matter of personal taste, we are reduced to saying that our tradition is best and that all should follow it. So Hartung claims that "... the cultural relativist position is not the result of scientific analysis, in the sense that it is not based upon a comparison of all cultures against a set of moral criteria equally applicable to all cultures. ..." (p. 121). Instead of being objective the relativist position is "ethnocentric", causing the person surreptitiously to intro-

duce his culture as the universal norm.

Hartung's article is stimulating in the face of statements like those of Ruth Benedict: "As soon as the new opinion (cultural relativity) is embraced, it will be another trusted bulwark of the good life. We shall arrive then at a more realistic social faith, accepting as grounds of hope and as new bases for tolerance the coexisting and equally valid patterns of life which mankind has created for itself from the raw materials of existence" (*Patterns of Culture*. New York: Pelican Books Inc., 1946, p. 257).

I believe Hartung's attack is marred, however, when he says that it is scientifically correct that morality is cultural in origin (p. 121). What one suspects early in the article comes out clearly near the end, that Hartung is merely attacking the idea that all cultural standards are of *equal* value. He believes there is an empirical means for deciding between various standards. It is difficult to see, however, if he says that all morality is cultural in *origin*, how he himself can escape falling into the morass of cultural relativity and scepticism.

Denver, Colorado

May 1, 1954

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## PSYCHOLOGY

by

Philip Marquart, M.D.

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### Who Searches the Hearts.

Mrs. Piper was a simple New England woman but she could do impossible things. Prof. Wm. James of Harvard investigated her case in 1885 and found that she had very little education. She would go off into trances—trances which Prof. James thought were of an hypnotic nature, and then she could give out accurate information about relatives and even strangers who came in after she "went under". She could locate things that were lost, etc. Wm. James came to the conclusion that she was not doing these things by trickery, but that it was actually accomplished through the spirits of people long dead. Whenever Mrs. Piper went into a trance a "spirit control" would apparently take over. One of these controls called himself "Dr. Phinuit" a French physician, while another was called "George Pellew" who had recently died. Under his control, she recognized persons known by Pellew. She also translated some Greek, for Pellew knew Greek.

After many series of seances, the psychologists were perplexed, for it was not just a trick. It was more than mind reading and more than recalling the past. They say that Mrs. Piper is still living at about 100 years of age.

Cases like this do occur. They occur among those

who are the enemies of the Lord, mediums and witch doctors. Thus we know that Satanic spirits are able to peek into our minds to some extent, and to influence and obsess even the minds of Christians.

Mental telepathy is a live topic just now because of recent articles on the subject by Aldous Huxley (*Life and Readers Digest*) and interesting comment on the subject by C. E. M. Joad. Where do we stand as Christians on this matter? There are those conservative Christians who say we ought never to mention this subject because it is of the devil. We cannot agree. The *psi function*, as psychologists call it, must be a natural function: therefore created of God. Any created thing may be used of the devil, or of God, in accordance with our own human decisions and choices. The case of Mrs. Piper, above, may even be a case of "possession".

Missionary A. W. Bailey came back to his thatched home from a long hot journey. As he was preparing a bath, he foolishly entered the bath room without a candle, and in his bare feet. Suddenly he realized that he placed his foot on the squirming body of a poisonous snake. He jumped for safety and fortunately for him the snake did not attempt to bite him. He wondered why. The following year while on furlough, (as A. W. Bailey recently told me personally) he encountered a lady in the state of Maine who told him why. On the very same calendar day as his encounter with the snake, at the very same hour, as rated by the proper time changes, this lady awakened from sleep with an urgent feeling that she should pray for Missionary Bailey. The Lord even gave her a waking vision of Bailey with his bare foot on a large snake.

Needless to say there is nothing Satanic about the E. S. P. (if so it be) involved in this account. In fact, it is supernatural Revelation (Deut. 29:29) from God.

The cases above have features about them which indicate that they are non-natural, whether it be the use of natural mechanism or not. The researchers of our psychologic world, such as Dr. Rhine of Duke University, are looking for a natural function of human nature when they postulate the *psi function* (which is studied by parapsychology). Here are some of the things they think they have found about it. It is so insignificant that it is only found by very careful statistical methods. It has no practical value. Rhine believes that the *psi function* does not vary inversely with the square of the distance involved—and therefore it is not a physical entity. This means that thought is not mere physical energy.

G. E. S. P.—the general function involving perception.

P. T.—mental telepathy from another mind.

P. C.—clairvoyance, without mediating of other minds.

Precognition—Looking into the future.

P. K.—Psychokinesis.—physical change enacted at

a distance without means.

However, we as Christians, would have certain questions to ask. When Jesus foretold His crucifixion was He using a natural precognition, or His own omniscience? When Jesus knew what was in man, was this natural P. T., or was it omniscience? When the 46th Psalm says, "He uttered His voice, the earth melted", is this psychokinesis, or is it omnipotence?

The article by Aldous Huxley includes several things that have no relationship to G. E. S. P. Some of these are some experiences of identical twins and people who look identical. Much time and space is wasted in considering the homing behavior and migratory trends of animals. There is no evidence that these matters have anything in common with the parapsychology of human beings. Moreover, the space devoted to hypnosis is perplexing. Hypnotism is not mysterious like E. S. P. We understand some of its basis in the matter of suggestion and its action over the medium of the autonomic nerves. Thus we know that blisters, like burns, may be raised on the subject's skin, just by suggestion. But this has no relation to the psi function. Only God can search the heart (Jer. 14:9) Wheaton Illinois  
April 29, 1954

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## **SOCIOLOGY**

by

**Frank E. Houser**

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In the last issue of this periodical there appeared Dr. S. R. Kamm's extremely pertinent analysis of the Morgenthau school of thought. In my judgment its pertinence is due to the highlighting of the concept of human nature—both Morgenthau's and Dr. Kamm's.

The concept of human nature is, of course, a pivotal one for the social sciences. Some years ago the concept of human nature had been consigned to the ash bin by the positivists. With characteristic impertinence this banished subject managed to hide away in the attic, waiting until only recently to descend into the living room of contemporary thought when a less dogmatic generation would give him a fairer hearing.

Because of the renaissance of the concept in the various disciplines of social science it is regarded as proper to consider it in this column. Admittedly this subject extends beyond empirical treatment. But what empirical research in human behavior is there which doesn't have an assumption (even "hidden" in the attic perhaps) regarding human nature? Believing that basic presuppositions must be considered as rigorously as data—else contemporary research is meaningless—I propose here a quick survey of how "human nature"

is handled in sociology. To enable contrast, a distinctive Christian position is first presented in the following paragraphs from an unpublished statement by Dr. S. R. Kamm of Wheaton College.

"Christian social scientists will find it helpful to recognize, both on the basis of Biblical analysis and on the basis of rational demonstration, that man is tripartite, that he is composed of spirit, soul and body, (I Thes. 5:23) and that man therefore partakes of the nature of the spiritual order of beings, the order of ideas or mind, and the order of the body or of the natural world. It is therefore quite in order to refer to the spiritual aspect of man as an essence which does not change in response to non-spiritual forces. As a spiritual being man exhibits a constant response to God, his creator, or rebellion until such time as the grace of God changes that attitude to an attitude of love and obedience.

"Man's mind as part of God's endowment is part of the universal order of the nature of men. It is subject to analysis and study. Certain laws of mental activity of the nature of generalizations may be made concerning this phase of man's personality. As part of the universal nature of men it is subject to control and change through the understandings revealed by revelation, by rational thought, and controlled observation.

"Man's body is part of the universal order of the natural universe. As such it also is subject to analysis and study in the same manner as the other parts of natural universe, with this limitation that man's body is also influenced in its behavior by the mind and by the spirit."

Dr. Kamm, of course, emphasizes that spirit, soul, and body are facets or aspects of a unitary personality.

Now note the three emphases characterizing sociology as far as the question of human nature is concerned. First of all, there are those who *dismiss* the question of the essence of human nature. An example here would be Karl Marx who says that, "The human essence is no abstraction inherent in each individual. In its reality it is the ensemble of social relations." According to Venable, Marx is taking an unambiguous position on the issue; man can be no more than what men actually do in their concrete historical and social environments. So Marx dismisses the question of the essence of human nature regarding such a question as wrongly assuming individuals for analysis rather than people in relationship.

Secondly, there are the vast number of contemporary sociologists who *miss* the question of essence. They differ by degrees from Karl Marx. They simply do not discuss the question of whether human nature is good or bad. They focus on behavior. They talk about original nature by which they mean reflexes, skeletal structure, drives, temperament, and capacities—matters which are carried by the genes. They say that this



original nature needs society to become human nature: that without society, original nature never becomes human nature. For them there is an eternal trinity of personality, culture, and society. These sociologists also point out that in the consideration of human nature there is a tendency for people to believe some behavior patterns to be innate when in reality, they are culturally determined. The sociologist denies that such things as aggressiveness, acquisitiveness, etc., are biologically determined. The common characteristics of human nature are reflections of culture. So in regard to the contemporary sociologist, I would conclude that they miss the question of goodness or badness of human nature through their emphasis on the empirical study of behavior.

Thirdly, there are thinkers in contemporary social science who neither dismiss the question nor miss it, but hit it. Karen Horney, late eminent neo-Freudian, answers the question of whether or not human nature changes by saying that there is the possibility of good and evil in human behavior. But, the constructive urges and the destructive urges in human nature come from different sources. The constructive sources comprise what Horney calls man's essential nature or real self. (Note the different connotation of "essence" in Horney and Kamm). The destructive forces are those which make it impossible for man to fulfill himself. Karen Horney says, "Just as a tree needs peculiar conditions for its growth, so does the child. If the environmental conditions are favorable, a child grows into a sincere, warm, and active human being, and develops whatever particular potential he has. He does so because, as every living organism, he has the innate urge to grow. . . Under conditions unfavorable to its growth this development can go easily astray. Then he may become wary, hostile, withdrawn, and overdependent."<sup>1</sup> Apparently then, when pride, ruthlessness, ambition, and other characteristics occur, it is not because of man's essential nature. It is like a tree which becomes crooked not because of what is in the tree, but because of the sun, soil, the wind, and so on. Karen Horney concludes that hostility is acquired, not innate. What can be acquired can be changed.

The nature of human nature is not a finished subject. It may never be (due to its nature). However, what may yet be formulated concerning both essence and behavior of human nature promises to clarify assumptions which have been hidden or unqualified or both.

Wheaton, Illinois  
May 3, 1954

1. Excerpt taken from sound recording of Dr. Horney.

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## LETTERS

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### *Editor:*

I enjoyed very much reading Professor Buswell's short bibliographical analysis of texts in anthropology and am looking forward to his continued contributions. With the little experience teaching the subject I have had, I must heartily concur that introductory anthropology courses must be reading courses, there being no one satisfactory textbook. I might ask, however, of what course in the social sciences is this not true if one is to have a well-grounded knowledge of any one of them. Of anthropology, however, it is especially true because of the attempted "all inclusiveness" of the discipline purporting to study all about man. It takes an "encyclopedist" to be an expert in the whole field.

There is a tendency in some education circles therefore (notably the British) to divide anthropology into at least four separate and mutually exclusive disciples: for example, linguistics, physical anthropology (including both human evolution and living races), ethnology (which is termed social anthropology in Britain), and cultural anthropology. Linguistics is usually the only field separated from anthropology as a whole in America. I don't mean to imply that language and culture are not thought of by anthropologists as inseparably intertwined, but we do have many linguists who are not anthropologists. On the other hand, we have hybrid studies like meta-linguistics. It is felt perhaps that man cannot be parceled out piecemeal into separate packages but must be studied as a whole being. Note how more and more in America the social sciences are being studied together particularly sociology, psychology and anthropology.

I do not think, however, that we can imply that there is a distinct American school of anthropology as opposed, for example, to a British or European school as might be implied by Professor Buswell's statement that there are "fundamental differences between the viewpoint of British social anthropology and the American cultural perspective." It seems rather that we have all borrowed from each other and that there are several emphases on both sides of the Atlantic. If British "social anthropologists" are unwilling to plunge head first into the uncertain methodological waters of a comparative sociology, it is not so much that they disagree with many Americanisms, such as trait, complex, configuration, theme, etc., but that they shy away from the over-optimism with which they are applied. The British furthermore, being "colony conscious" lay a greater stress on the application of anthropology to colonial and social problems. This might be expected from the nature of their needs. I think that the British were the first

to demand that their colonial administrators have anthropological training. For this reason, I believe they tend on the whole to be more practical and less theoretical, although, of course, they have their share of arm-chair scientists.

This practical approach finally ought to appeal to us who are Christian teachers whose courses are geared for training Christian workers, especially missionaries. In this light I have found Ralph Piddington's *An Introduction to Social Anthropology* (Praeger, 1950) a very helpful text to ground students in the general technique of description in the second semester of the sequence in anthropology. This is, of course, supplemented with ample outside work. To emphasize what I mean by practical approach note the following from page 10 of Piddington's introductory chapter. Dealing briefly with culture contact he writes,

"This not only involves problems of considerable theoretical interest, but is also vital to the problems of missionaries, officers in the Colonial Service, and others whose work brings them into direct contact with native peoples. For these, insight into the working of primitive society is of the greatest importance; here, as always, the co-ordination of science and practical affairs is essential to each. Anthropology can derive incalculable benefit from the specialist knowledge of administrators experienced in the native government, from missionaries who have gained the trust and affection of the people, and from experts in agriculture, forestry and nutrition, just as these specialists require a knowledge of native political and legal institutions, religious life and systems of land tenure, economics and diet."

This is a more friendly attitude toward both applied anthropology and the missionary than I have found among American anthropologists as a whole. I wish Professor Buswell would have denied his slight American prejudice and would have included in the main body of his study the books which he relegates to the footnotes.

Finally I note at least one omission in his listing of general texts which at least for me is significant, and here I may find my own prejudice hard to disguise. Wilson Wallis, my teacher and the head of the department of anthropology at the University of Minnesota, published a text many years ago (Harper and Brothers) with the title which was not in that early day trite: namely, *An Introduction to Anthropology*. Dr. Wallis was a Rhodes scholar and indirectly at least sat at the feet of Tylor. R. R. Marrett, Tylor's outstanding pupil, was his teacher. I'm not certain off-hand of the date of this text's publication, but it was one of the very earliest in the field.

James M. Murk

Bob Jones University, Greenville, South Carolina  
March 8, 1954

JNE, 1954

Editor:

Mr. Murk's reactions to my remarks on British anthropology were indeed welcome, and it is an added pleasure to become acquainted through correspondence at least, with another Christian anthropologist. The opportunity to discuss problems with another Christian in our field is perhaps rarer than in some others. While the subjects in Mr. Murk's letter will be taken up at more length in future installments of the "Reading Course", I am grateful for this invitation to offer a few comments in reply.

I am very sorry to have overlooked the text by Dr. Wallis in the discussion of introductory texts. While it was mentioned in the following issue, only brief reference was made to it because of its date (1926). It was a very worthwhile text indeed for that day.

There are two points in Mr. Murk's comments with which I cannot fully agree. First of all, I do not think the fact that "we do have many linguists who are not anthropologists" is justification enough to say that "Linguistics is usually the only field separated from anthropology as a whole in America." Only in a limited historical, or comparative philological sense is this true. The rapidly growing number of ethnolinguistic studies, and the increasing reliance upon linguistic data by American ethnologists is proof that such a claim must be more carefully qualified.<sup>1</sup>

Secondly, I cannot agree that the differences between American and British anthropology are only matters of emphasis. Also, Mr. Murk's use of the term "comparative sociology" is unfortunate. Almost countless references could be cited from current and recent literature on both sides of the Atlantic showing that the British social anthropologists are admittedly interested in sociological rather than strictly cultural analysis in the American sense. One can hardly read the reviews of the British texts listed in the footnote which Mr. Murk refers to without being repeatedly impressed by the fundamental sociological orientation, with the consequent theoretical differences which characterize British social anthropology as a rather distinct "school".

For instance, John Gillin says that "Nadel seems to be unaware . . . of a great deal of American theoretical work in culture of the past ten years."<sup>2</sup> Sol Tax says that Evans-Pritchard "seems to be disinterested in, if not against, what he calls ethnology, which is clearly associated with the study of culture. . ."<sup>3</sup> And Hoebel says of Piddington, that "internal evidence indicates that the author has limited his own reading in large measure to the products of his own school. He seems actually to be unaware of a considerable number of truly significant studies done by Europeans and Americans. What he has read of the works of anthropologists in this country is, with few exceptions, obsolete."<sup>4</sup>

These statements, indicating a certain degree of

provinciality outside of the "American cultural perspective", only give an inkling of the fundamental differences which could be further elaborated.

However, I must hasten to agree with Mr. Murk on the great practicality of British anthropology which it has gained from a heritage of colonialism. The necessity of focusing upon such problems has indeed highlighted many which are common to the missionary effort and colonial administration alike. Both are agents of acculturation—planned acculturation. Both have been operating, for example, in Africa side by side for three or four generations. Both are attempting to replace a part of native culture with something of their own. It is, therefore, common knowledge that British anthropology takes a characteristically different view of the missionary role than is traditionally taken by American anthropologists, who have been more prone to think of the missionary in the same category as the American population at large thinks of Imperialism.

Consequently Mr. Murk is correct in urging the use of British texts for Christians who are interested in an effective and practical approach. Similarly American texts, when they discuss field methods, turn almost invariably to Malinowski. With respect to Piddington, however, particularly in view of the number of shortcomings brought up by Hoebel in his review, I believe

we can do better in selecting a book which has a broader scope than the functionalism of Malinowski. There are American texts which are so far superior to Piddington's in many other ways, that their overall value for missionary training surpasses Piddington despite his friendly attitude toward missionaries.

Jame O. Buswell, III

Shelton College  
Ringwood, New Jersey  
May 4, 1954

#### NOTES

1. I have dealt more fully with this subject in an unpublished paper filed at the University of Pennsylvania library, entitled *An Introduction to Ethnolinguistics*.
2. Gillin, John. Review of *The Foundations of Social Anthropology*, by S. F. Nadel. *American Anthropologist*, Vol. 54, No. 1, (1952), p. 75.
3. Tax, Sol. Review of *Social Anthropology*, by E. E. Evans-Pritchard. *American Anthropologist*, Vol. 54, No. 3, (1952), p. 389.
4. Hoebel, E. A. Review of *An Introduction to Social Anthropology*, Vol. 1, by Ralph Piddington. *American Anthropologist*, Vol. 53, No. 2, (1951), p. 247.