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Science Notes - Book News : "*Science and Creation: Geological, Theological and Educational Perspectives*"

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SCIENCE NOTES

Book News

"Science and Creation: Geological, Theological and Educational Perspectives," Robert W. Hanson, Editor, Macmillan Publishing Co., N.Y. (1985) (In press)

One of the symposia of the 1982 annual convention of The American Association for the Advancement of Science (AAAS) was titled "Science and Belief." The all-day sessions consisted of two parts: I. The Interface (between science and belief), and II. Problems for Science Education. Part I was arranged by Rolf Sinclair of the National Science Foundation and Joseph Dasbach of the American Association for the Advancement of Science. Part II was arranged by Robert W. Hanson, then executive director of the Iowa Academy of Science and past president of the National Association of Academies of Science (NAAS), an AAAS affiliate. The AAAS included this topic in its extensive annual program to discuss certain aspects of the continuing creation/evolution controversy in the context and format of a scientific meeting rather than as a debate between opposing groups. The sessions were so well received and so heavily attended that the 10 speakers were asked to present their viewpoints on the geological, theological, and educational aspects of the creation/evolution controversy to a wide audience. A book based on the symposium will appear in the spring of 1985 as part of the AAAS Series on Issues in Science and Technology. Edited by Robert W. Hanson, the volume is being published by Macmillan Publishing Company, New York.

The introductory chapter written by the editor contains this explanatory statement:

> During the past few years the scientific community at large and the education community in particular have awakened to the public's concern about restoring traditional values in American society. The theory of evolution is seen by many Fundamentalists as responsible for the destruction of these values. Thus, in an attempt to restore this value system, a substantial part of the public has supported the movement to teach "creation science," which purports to show that a literal interpretation of the Genesis account of origins, including the notion that the universe is only a few thousand years old, can be supported scientifically.

The editor goes on to describe some of the characteristics of the creation/evolution debate and offers the view that even though "scientific creationism" is presented by proponents as a non-religious approach to origins, its relation to religious belief is inescapable. The title of the book, "Science and Creation" used the term *creation* rather than *creationism* to point out the distinction between the two terms. The editor calls attention to this distinction, as explained by one of the authors, a theologian, in Chapter 11.

Rather than taking a polemic attitude in opposing creation (as opposed to creationism), the authors recognize the role of religious belief in American society and deal with several aspects of the controversy, ranging from harmonizing the Genesis account with modern geology to practical aspects of the problem

that concern science teachers. The book concludes with a discussion of the controversy from the viewpoint of a theologian.

The book consists of eleven chapters and two appendixes that deal with the geological, theological, and educational aspects of the movement to promote the teaching of creationism as science:

1. Introduction: Science or Belief: A False Dichotomy - Robert W. Hanson, Dept. of Chemistry, Univ. of Northern Iowa, Cedar Falls, IA.
2. The Age of the Earth, of Life, and of Mankind: Geology and Biblical Theory versus Creationism - James W. Skehan, S.J., Director of the Weston Observatory, Boston College, Weston, MA.
3. Science, Rationality, and the Creation/Evolution Dispute - Dorothy Nelkin, Program on Science, Technology, and Society, Cornell University, Ithaca, N.Y.
4. Science versus Revealed Truth: The Challenge of Creationism in the Classroom - Wayne Moyer, People for the American Way, Washington, D.C. (formerly Executive Director, National Association of Biology Teachers).
5. Creationism in Iowa: Two Prototype Defense Strategies - Stanley L. Weinberg, Textbook author, Ottumwa, IA.
6. Creationism in Kentucky: The Response of High School Biology Teachers - William E. Ellis, Dept. of History, Eastern Kentucky University, Richmond, KY.
7. A Two-Model Creation versus Evolution Course - William M. Thwaites, Dept. of Biology, San Diego State University, San Diego, CA.
8. Educational Approaches to Creationist Politics in Georgia - Kenneth Saladin, Dept. of Biological and Environmental Sciences, Georgia College, Milledgeville, GA.
9. Creation, Evolution, or Both? A Multiple Model Approach - Craig E. Nelson, Dept. of Biology and School of Public and Environmental Affairs, Indiana University, Bloomington, IN.
10. Skepticism: Another Alternative to Science or Belief - Stephen G. Brush, Institute for Physical Science and Technology, University of Maryland, College Park, MD.
11. The Creationism Issue: A Theologian's View - Langdon Gilkey, Divinity School, University of Chicago, Chicago, IL.

Appendix A: The Arkansas Creation Science Statute (Act 590 of 1981)

Appendix B: "Creationism in Schools: The Decision in McLean versus the Arkansas Board of Education."

The term "belief" appears in many of the chapters, often in counterposition with "science". The former refers to religious belief in most cases, but some of the authors point out that belief exists in science as well as religion. In science, "belief" is a much more tentative conclusion than in religion about the relative validity of a hypothesis, whereas in religion, belief is a rather static final conclusion about something. (Thwaites, Chapter 7)

The introductory chapter makes the point that the "scientific creationism" movement tends to try to force students into a choice between evolution and

creation, as though these are the only choices possible. Nelson (Chapter 9) describes a way out of this false creation/evolution dichotomy — a course that allows the teacher to discuss both scientific and religious values without demeaning the religious choices of others and without imposing the teacher's own value choices on the students. The strategy he describes is to present a whole range of combinations of the two extremes and then to focus on the value assumptions made by supporters of each position.

In Chapters 7 and 8, Thwaites and Saladin, respectively, describe experiences in teaching "two-model" courses in which the evidences for creationism and evolution are examined comparatively. Both authors describe how students reacted to such experience. This approach to the creation/evolution controversy, as a manifestation of the false dichotomy described by the editor, appeared to place students in the unwarranted position of having to hold their religious beliefs up to scientific examination; and religious beliefs generally suffered as a consequence.

In Chapter 6, Ellis describes a survey of biology teachers in Kentucky. In addition to determining that evolution is taught less than the creationists seem to think and more than the liberals seem to think, he found that about 90 percent of his responding teachers had definite religious affiliations. In other chapters authors clearly identify the "scientific creationism" movement with Christian Fundamentalism. Moyer, in Chapter 4, presents a detailed statement of Christian Fundamentalist belief and examines the truth claims of both science and religion.

The emergence of "creation science" as a way of getting away from constitutional objections to creationism's religious roots is examined by Weinberg in Chapter 5. He describes strategies used successfully in Iowa and elsewhere to counteract the influence of proponents of "scientific creationism" on teachers and school boards, citing particularly the Committees of Correspondence. The political nature of the controversy is described in this and other chapters (Chapter 3 and 8). In Chapter 3, Nelkin maintains that with the political ideology that prevails at this time, the influence of the "scientific creationists" will persist and is not likely to be affected much by the actions taken by scientists in supporting position statements put out by their societies. Such statements appeal to rationality, assuming that others see science from the same perspective as do scientists — a false assumption in Nelkin's opinion.

Chapters 2 and 11 approach the creationism issue from the standpoint of Biblical theory, geology, and theology. Skehan compares the Genesis account with geological findings and sees no conflict. Gilkey discusses the complex relation of scientific thought to religious thought in a technological society, pointing out that religion is pervasive and has grown in importance because of the anxieties and dilemmas of an advanced technological age. According to Gilkey, science and religion will inevitably be related to one another, and if the relationship is not rational, responsible, and humane, some religious forms can be "demonic, uncreative, ideological, and dogmatic." He blames science for having a part in the genesis of the creation/evolution controversy, and calls for a change in educational programs to include the history and philosophy of science,

"for it is an almost total lack of those disciplines in scientific training that has caused the unfortunate *misunderstanding* of science itself and of religion that has helped to breed this controversy."

In Chapter 10, Brush views the controversy as an historian of science and examines the role of skepticism in both science and religion. He says there is merit in examining skepticism for what it has contributed to science and to religion, and concludes that extreme dogmatism in either area is untenable.

As the editor concludes his introductory chapter, he points out that belief has to stay in equilibrium with the constant flow of new knowledge about the universe, and use it, not avoid it. "The drawing power of debates between 'scientific creationists' and evolutionists testifies to the reality of the concern of both scientists and the public about the relationship between science and belief. Clearly, we need both. They have served as two awesome driving forces, interweaving to lead us to where and what we are today. But if they are to coexist, each must respect and learn from the other. It is in that spirit that we offer this book."

Previewed by Robert W. Hanson Ph.D., Prof. of Chemistry and Science Education, Dept. of Chemistry, Univ. of Northern Iowa, Cedar Falls, IA 50614.

Book News

Fundamentals in Laboratory Microbiology, published by the Iowa State University Press, is a self-paced laboratory approach to introductory microbiology that assumes no prior knowledge of biology on the part of the student. Classical methods are stressed, with an emphasis on the natural relationships between organisms and their environment.

Fundamentals in Laboratory Microbiology provides a base of understanding for the principles of microbiology in a format that enables students and teachers to use the manual separately or in conjunction with a microbiology text.

Six packets are included in the manual: Introduction, Making Observations, and Using the Microscope; Media Makeup and Sterilization Techniques; Bacterial Growth; Antiseptics, Disinfectants, and Antibiotics; A Study of Bacteria in Three Natural Habitats: Water, Soil, and Air; and Viruses. Diagrams and photos accompany explanations of laboratory procedures.

Fundamentals in Laboratory Microbiology is suitable for biology, science, or microbiology courses at the high school, junior college, and vocational school levels. This manual serves the needs of instructors for an appropriate low-cost laboratory instruction guide that uses easily obtainable materials.

A teacher's guide that includes objectives, materials needed, preparation of materials, teacher notes, and sample answers to questions is also available.

The authors of *Fundamentals in Laboratory Microbiology* are Sandra S. Gottfried, science instructor, Ona M. Wilcox School of Nursing, Middletown, Connecticut, and James L. Kelly, associate professor of teaching — science, Price Laboratory School, University of Northern Iowa, Cedar Falls, Iowa.

This manual is available from Iowa State University Press. 2121 South State Ave., Ames, IA 50010.