ARTICLE

The Elusive Scientific Basis of Intelligent Design Theory

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The book *Of Pandas and People: The Central Question of Origins* by Percival Davis and Dean Kenyon is a high-school level text book designed to supplement traditional biology texts. The authors repeatedly refer to intelligent design as an alternative theory to neodarwinian evolution (Davis & Kenyon 1993, pp. 25, 26, 41, 78, 85). Because the adoption of this book is being considered in some public schools, it is worth asking about the status of this theory: Is intelligent design theory actually used by scientists? The question is a fundamental one because scientific theories are not just ideas or hypotheses outlined in a textbook, but are the basic research tools of professional scientists. A theory represents a collection of explanations, hypotheses, tests, and applications, including anomalies and failures (Kuhn 1962). Not all aspects of any theory are directly testable. For example, any theory explaining organismal diversity cannot be directly tested, since the plants, animals, and microbes that make up the living world are the result of a historical process not readily replicated in the laboratory. However, evolutionary theory (and, presumably, intelligent design theory) contains corollaries that make non-obvious predictions about patterns within the existing biota that can be tested.

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If intelligent design theory is a viable alternative to evolutionary theory, then scientists must be using it to devise tests and to interpret patterns in the data they collect. What sense would there be in presenting an idea as a scientific theory if the idea were not actually used by working scientists? The importance of a scientific theory is not related to its popularity among the general public, but to its utility in directing research and explaining observations within a particular field of study (Kuhn 1962). For example, millions of people read their horoscopes each day, but astrology plays no role in directing research by astronomers or psychologists. Astrology, therefore, is not discussed in science textbooks except in a historical context. Because professional scientists must publish their work to retain their jobs and to obtain funding, the relative status of intelligent design theory and evolutionary theory can be assessed by comparing their frequency of usage in the professional scientific literature.

To compare the scientific literature on evolution and intelligent design, I used five different computerized databases that catalog scientific periodicals, books, and reports. I searched each database for the keywords "intelligent design" and "evolution". BIOSIS (1997, Biological Abstracts, Inc.) is the online version of Biological Abstracts and covers approximately 6000 journals in the life sciences. The Expanded Academic Index (1997 Information Access Co.) indexes and abstracts 1500 scholarly and general interest periodicals, covering all major fields of study in the humanities, social sciences, and science and technology. The Life Sciences Collection (1997, Cambridge Scientific Abstracts) indexes 200 journals in all fields of biology. Medline (1997, National Library of Medicine) indexes over 3700 journals in the health and life sciences. Finally, the Science Citation Index (1996, Institute for Scientific Information) covers over 5000 journals in all fields of science. The Expanded Academic Index covers a broader range of subjects and lists more general publications; the other four indices list primarily professional science publications and feature more technical journals. The results of the searches are shown in Table 1.

Table 1. Summary of literature search results for the terms "intelligent AND design" and "evolution" in five computerized indices.

Index	Years	Intelligent Design	Evolution
BIOSIS	1991-97	1	68 832
Expanded Academic Index	1989-97	30	14 298
Life Sciences Collection	1982-97	1	45 963
Medline	1990-97	1	29 228
Science Citation Index	1992-95	4	10 333

Although Davis and Kenyon may claim that intelligent design represents a viable alternative to neodarwinian evolution, the scientific literature does not support that claim. Compared with several thousand papers on evolution, the combined searches produced only 37 citations containing the keyword "intelligent design." A closer look at those

37 references suggests that none reports scientific research using intelligent design as a biological theory. "Intelligent design" popped up most frequently in the index with the broadest range of topics, the Expanded Academic Index. Of the 30 articles, 12 were articles on computer software or hardware, eight were on architectural or engineering design, two were on advertising art, and one was on literature. The remaining seven were about biology; five were discussions of the debate over using *Pandas* by various school boards, and two were comments on Michael Behe's (1996) book in a Christian magazine.

The four papers in the Science Citation Index were all about engineering or welding technology. The single paper in the Life Sciences Collection was about computer methods used to analyze particulate air pollution. The single paper in Medline was about bioengineering drugs with high thermal stability. The single paper in BIOSIS was about a computer-controlled system for manufacturing fertilizer. This search of several hundred thousand scientific reports published over several years failed to discover a single instance of biological research using intelligent design theory to explain life's diversity. It is worth noting that although Davis and Kenyon are both professional scientists, neither has apparently published anything in the professional literature about their theory.

In all fairness, the number of references found using "evolution" surely overestimates the number of papers about biological evolution since the word "evolution" is widely used among academics to describe directional change. This is especially a problem in a diverse database, such as the Expanded Academic Index, which lists popular periodicals as well as research publications. For this index, I narrowed the search by specifying "evolution AND research" as subjects. This eliminated most of the non-scientific entries and brought the number of citations down from over 14 000 to 6935. This index, however, lists far fewer primary research publications than the other, more specialized professional indices referenced here.

Indices such as BIOSIS limit their citations to those in the science literature and so should provide a better estimate of the frequency of studies on evolution. BIOSIS applies a code to each reference indicating its intellectual scope. The code "CC01500" is applied to articles on "...philosophical, theoretical, and experimental studies on the origins of life, natural selection, phylogeny, speciation, and divergence." Thus, articles categorized by this code deal in some way with biological evolution. Of the 68 832 articles found in BIOSIS (1991-1996) using the keyword "evolution", 46 749 of them were assigned "CC01500" as their major code. Most of these papers were written by professional scientists to communicate their research efforts. Although popular authors such as Michael Denton (1986) and Phillip Johnson (1991) have published books declaring Darwinism to be dead, the data above suggest that the message apparently has not reached professionals doing the actual science.

Davis and Kenyon have baptized their concept of external design of living organisms as "intelligent design theory", but where is the research using this theory? The first edition of their book appeared in 1989; surely by 1997 there should be some evidence of intelligent design theory in the scientific literature if it is a bona fide piece of science. Scott and Cole (1985) searched the literature in the mid 1980's for published evidence of "scientific creationism" and found no articles dealing with empirical, experimental, or theoretical treatments of the creationist "model" in over 4000 professional and technical journals. During the course of this search, I also looked for scientific research articles containing the words "creation science" in the above indices; like Scott and Cole, I found none.

Why should we reserve a place in the science curriculum for science that apparently does not exist?

Creationists and proponents of "alternative" theories of organic diversity claim that the science supporting their views is not given a place in the classroom; if any science supporting these views has been done, it is quite well hidden. Why should we reserve a place in the science curriculum for science that apparently does not exist? Teachers wanting to give an exercise in frustration should send their students to the library to glean the latest scientific research on intelligent design theory or creation science, admonishing the students that papers on welding technology do not count. Any school board considering adoption of the *Pandas* text needs to question why science teachers should be expected to bear false witness in the classroom. Until intelligent design theory can be shown to have any status as a scientific theory of biological organization, it has no place in a biology curriculum.

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