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Evolution and Its Discontents

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The Kansas Board of Education adopted new science standards last week that include required criticism of evolution. Some of the additions are below, paired with the mainstream understanding of evolutionary biology. (Words bolded for emphasis)

ADDITIONS TO KANSAS SCIENCE STANDARDS:

Biological evolution postulates an **unguided natural process** that has no **discernible direction or goal**.

RESPONSE OF MAINSTREAM SCIENTISTS:

"Unguided" is "a very slippery word," said Glenn Branch, deputy director of the National Center for Science Education. Scientific explanations of all natural processes, from hurricanes to supernovas, are all "unguided."

ADDITIONS TO KANSAS SCIENCE STANDARDS:

The view that living things in all the major kingdoms are modified descendants of a common ancestor (described in the pattern of a branching tree) has been challenged in recently by such things as: **Discrepancies in the molecular evidence** (e.g., differences in relatedness inferred from sequence studies of different proteins) previously thought to support that view.

RESPONSE OF MAINSTREAM SCIENTISTS:

The family tree relationships of some of the early life forms remain unclear. But fossil and biological evidence argues that **all life today descends from the earliest organisms**. Not surprisingly, **new methods** like comparison of proteins or genes have generated family trees that differ somewhat from those deduced from fossils. But those differences **have not fundamentally changed scientists' view of evolution** or common descent.

ADDITIONS TO KANSAS SCIENCE STANDARDS:

Whether microevolution (change within a species) can be extrapolated to explain macroevolutionary changes (such as new complex organs or body plans and new **biochemical systems which appear irreducibly complex**) is controversial.

RESPONSE OF MAINSTREAM SCIENTISTS:

Most biologists do not make the distinction between microevolution and macroevolution; the larger changes are simply the accumulation of small changes. Most also say that the issue is not controversial and that there is **much experimental evidence** to indicate that such changes have occurred.

The term "**irreducibly complex**" is used by Michael Behe, a professor of biology at Lehigh University who is one of the main proponents of intelligent design, but **is not used by other biologists**.

ADDITIONS TO KANSAS SCIENCE STANDARDS:

Some of the scientific criticisms include:

- a. **A lack of empirical evidence** for a "primordial soup" or a chemically hospitable pre-biotic atmosphere;
- b. The **lack of adequate natural explanations for the genetic code**, the sequences of genetic information necessary to specify life, the biochemical machinery needed to translate genetic information into functional biosystems, and the formation of protocells; and
- c. The **sudden rather than gradual emergence** of organisms near the time that the Earth first became habitable.

RESPONSE OF MAINSTREAM SCIENTISTS:

The issue of how life originated is different from that of evolution. Current ideas on the origin of life are incomplete and no consensus has yet emerged. Most scientists find that this means more research is needed, not that it is impossible for a theory to emerge.

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