

**REMAINING FACTUAL ERRORS TO BE CORRECTED
IN BIOLOGY TEXTBOOKS PROPOSED UNDER
PROCLAMATION 2001**

As of April, 2004

Prepared by Discovery Institute

Science
Biology, Grades 9-12
Holt, Rinehart and Winston
Holt Biology, Texas Edition

Component	Page	Description of Error
Student Edition	262	Holt continues to wildly misstate the standard dating of the Cambrian Explosion.
Student Edition	286	The caption for the drawing of vertebrate limbs (Figure 9) that accompanies the discussion of homology on page 286 states: "The forelimbs of vertebrates contain the same kinds of bones, <u>which form in the same way during embryological development.</u> " (emphasis added) This is untrue, and documentation of this fact has been sent to the Board.

Science
Biology, Grades 9-12
J.M. LeBel Publishers
Biology: Patterns and Processes of Life

NOTE: This publisher filed a response to these errors that cited absolutely no documentation to back up its claims, and the TEA has refused to require it to submit evidence to justify these errors. Indeed, LeBel even admits some of the problems identified here, but refuses to makes changes even in those cases.

Component	Page	Description of Error
Student Edition	99	The text claims that "Until the 1500s, many Europeans believed Earth was flat and the sky was a large dome somehow suspended above it. Adventurous sailors like Columbus and Magellan, and the work of astronomers like Copernicus and Galileo, caused considerable controversy at the time...." It is not true that most Europeans in the 1500s believed in a flat Earth, or that Columbus caused controversy for believing that the Earth is round. Europeans inherited the ancient Greeks' knowledge not only of the Earth's shape, but also of its approximate circumference. Novelist Washington Irving's fictional 1828 account of how flat-earthers supposedly opposed Columbus was put forward as actual history by the late nineteenth-century anti-Christian authors John W. Draper and Andrew Dickson White, who used the flat Earth myth as a way of discrediting Christians who challenged Darwinian evolution. See the book on this subject by University of California historian Jeffrey Burton Russell, <i>Inventing the Flat Earth</i> (New York: Praeger, 1997). See also James R. Moore, <i>The Post-Darwinian Controversies</i> (Cambridge: Cambridge University Press, 1979).
Student Edition	99	The text falsely claims that "some scientists were executed for teaching that Earth and the other planets orbited the sun. Can you imagine living in a time when scientific curiosity was so discouraged or even forbidden?" It is not true that "some scientists were executed for teaching that Earth and the other planets orbited the sun." Giordano Bruno was executed by the Inquisition in 1600 for his heretical philosophical views and his zeal for religious reform; but although he happened to be a Copernican, his scientific views were not an issue. When Galileo attempted to convert the papal court to Copernicanism a few years later, Aristotelian scientists and philosophers prevailed upon the Church to silence him and place him under house arrest; but Galileo was never in danger of being executed for his Copernican beliefs. See Sir William Cecil Dampier, <i>A History of Science and its relations with Philosophy and Religion</i> (Cambridge: Cambridge University Press, 1977).
Student Edition	100	Although the publisher has agreed to remove the bogus embryo diagrams derived from Haeckel, the text still contains the misleading claim that "All vertebrate embryos closely resemble

		one another in early development." There is no indication in the text that the earlier stages of vertebrate embryos are actually quite different, or that early differences do not fit the pattern predicted by Darwin's theory.
Student Edition	100-101	In its discussion of homology on pp. 100-101, the book claims that "limbs, regardless of whether they are arms, legs, or wings, begin development in exactly the same way." The text goes on to claim: "Anatomical structures that have the same developmental pattern are called homologous structures. So a bat's wings, a dog's front legs, a whale's flippers and your arms are all homologous structures... Knowing all vertebrate limbs develop by the same pattern helped us to understand how they all came to have the same number of bones in the same positions." The basic message of this passage is false. In general, homologous features do not necessarily develop in the same ways in the embryo. Even among amphibians, the limbs of salamanders and frogs develop by different patterns. Documentation of these facts has been supplied to the Board.
Student Edition	112	This book includes photographs of light-and dark-colored peppered moths on two different tree trunks (on p. 112), without informing students either that peppered moths do not normally rest on tree trunks or that the photographs have been staged. <u>The accompanying text fails to inform students about any of the problems with the classical peppered moth story.</u>
Student Edition	166	This book includes a drawing of the Miller-Urey apparatus (on p. 166) accompanied by an account in the text that completely misleads students about the experiment's significance. Among other things, the accompanying text falsely implies that when "common volcanic gases like carbon dioxide (CO ₂), carbon monoxide (CO), [and] molecular nitrogen (N ₂)" are used, the experiment still works. In fact, when the experiment is repeated with a realistic gas mixture it doesn't produce key organic molecules. Most importantly, origin of life researchers now doubt the experiment's relevance in understanding the origins of the first life.

Science
Biology, Grades 9-12
Pearson Education, publishing as Prentice Hall
Prentice Hall Biology, Texas Edition

Note: This publisher has refused to make any of these corrections and has provided wrong citations claiming to justify the errors.

Component	Page	Description of Error
Student Edition	384	The text claims that "Structures that have different mature forms but develop from the same embryonic structures are called homologous structures." Actually, homologous structures have similar <u>adult</u> forms, but they do not necessarily develop from the same embryonic structures, so this statement has the truth exactly backwards.
Student Edition	384-385	The text claims: "It is clear that the same groups of embryonic cells develop in the same order and in similar patterns to produce the tissues and organs of all vertebrates." (p. 385) These statements are false. Homologous structures do not all develop in the same way, and this general truth holds for the vertebrate limbs discussed on p. 384. (Discovery Institute has presented the Board with substantial documentation of this fact from peer-reviewed science literature.)
Student Edition	385	This book uses photographs of actual vertebrate embryos (on p. 385), instead of drawings. Nevertheless, the embryos shown are from the three vertebrate classes (bird, reptile and mammal) whose embryos most resemble each other; the other four vertebrate classes are omitted. Prentice Hall claims that the other four classes of vertebrates (which were omitted from Figure 15-17) "would show essentially the same patterns as the existing photos." This claim is blatantly false. Published photographs of the various classes of vertebrates show striking differences, not "the same patterns." See Richardson, et al., Science 280 (1998): 983-986.
Student Edition	385	The accompanying caption misleadingly states: "In their early stages of development, chickens, turtles, and rats look similar, providing evidence that they shared a common ancestor." <u>In fact, the photographs show embryos midway through development instead of at their earliest stages.</u> Vertebrate embryos in their earliest stages are strikingly different, and their differences do not fit the pattern predicted by Darwin's theory. Prentice Hall's response to this objection evades the point. Unless the textbook informs students that the embryos being discusses here midway through development, the textbook misleads students about an important point: The actual pattern of vertebrate development is (i) early dis-similarity followed by (ii) similarity midway through development, followed by (iii) later dis-similarity. This pattern is a anomaly from the standpoint of Darwin's theory, not a confirmation of that theory.
Student Edition	424	The account in the text correctly points out that "scientists now know that Miller and Urey's original simulations of Earth's early

	<p>atmosphere were not accurate," but it goes on to state that "similar experiments based on more accurate knowledge of Earth's early atmosphere have also produced organic compounds" and clearly implies that these modified experiments still provide good evidence for how the building blocks of life could have been produced on the early earth, despite the fact that many origin of life researchers regard Miller-Urey type experiments to be a dead-end for origin of life research. According to an article published by the International Society for the Study of the Origin of Life: "It is now clear that Miller-like experiments create too many biological molecules, in mixtures that are too complex to self-organize in a way rationally likely to lead to replication. The intrinsic reactivity of organic material under the influence of energy is to create tar, not life; the enviable ability of minerals to fractionate themselves into organized forms is not displayed by organic materials in standard solvents at surface temperatures and pressures on Earth. Every additional molecule can be as easily an inhibitor for the formation of life rather than a contributor." (http://www.issol.org/trail.html)</p>
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Science
AP Biology, High School
Bedford, Freeman and Worth
Life: The Science of Biology

NOTE: This publisher has not responded to this error, nor has it been required by the TEA to do so.

Component	Page	Description of Error
Student Edition	452	The textbook fails to inform students that the Earth's early atmosphere was probably quite different from the mixture of gases used in the experiment, or that when the experiment is repeated with a realistic mixture it does not produce key organic molecules. The accompanying text completely omits any discussion of problems with the experiment, even though those problems have been widely reported in the scientific literature for several decades.

Science
AP Biology, High School
Thomson Learning/Wadsworth
Biology: The Unity and Diversity of Life

NOTE: This publisher has not responded to these errors, nor has it been required by the TEA to do so.

Component	Page	Description of Error
Student Edition	10, 283	This book includes photographs of light- and dark-colored peppered moths on various tree trunks (on pp. 10 and 283), without informing students either that peppered moths do not normally rest on tree trunks or that the photographs have been staged. The accompanying text fails to inform students about any of the problems with the classical peppered moth story.
Student Edition	312	Next to a drawing of bones in vertebrate limbs, the book states: "Comparative morphology provides good evidence of descent with modification. This field of inquiry focuses on the body form and structures of groups of organisms, such as vertebrates and flowering plants. Often it reveals a similarity in one or more body parts that has a genetic basis, that reflect inheritance from a common ancestor. Such body parts are known as homologous structures." By implying that homologous features must be based on similar genes, this passage makes a basic factual error. (Discovery Institute has presented the Board with substantial documentation of this fact from peer-reviewed science literature.)
Student Edition	315	This book contains a slightly simplified version of Haeckel's original fraudulent drawings of a fish, reptile, bird and human embryos.
Student Edition	315	The accompanying caption falsely states: "Adult vertebrates are diverse, yet their embryos are quite similar at very early stages. Diversity arises as embryos start developing differently at later stages." There is no indication in the text that the earlier stages of vertebrate embryos are actually quite different.
Student Edition	329	This book includes a drawing of the Miller-Urey apparatus accompanied by a misleading caption that claims Miller studied "the synthesis of organic compounds under conditions that presumably existed on the early Earth." The accompanying text fails to inform students that the Earth's early atmosphere was probably quite different from the mixture of gases used in the experiment, or that when the experiment is repeated with a realistic mixture it does not produce key organic molecules. The text completely omits any discussion of problems with the experiment.
Student Edition	336	This book uses the term "Cambrian explosion" but states as a fact the <u>hypothesis</u> that "most major animal phyla had evolved earlier in the Precambrian seas."