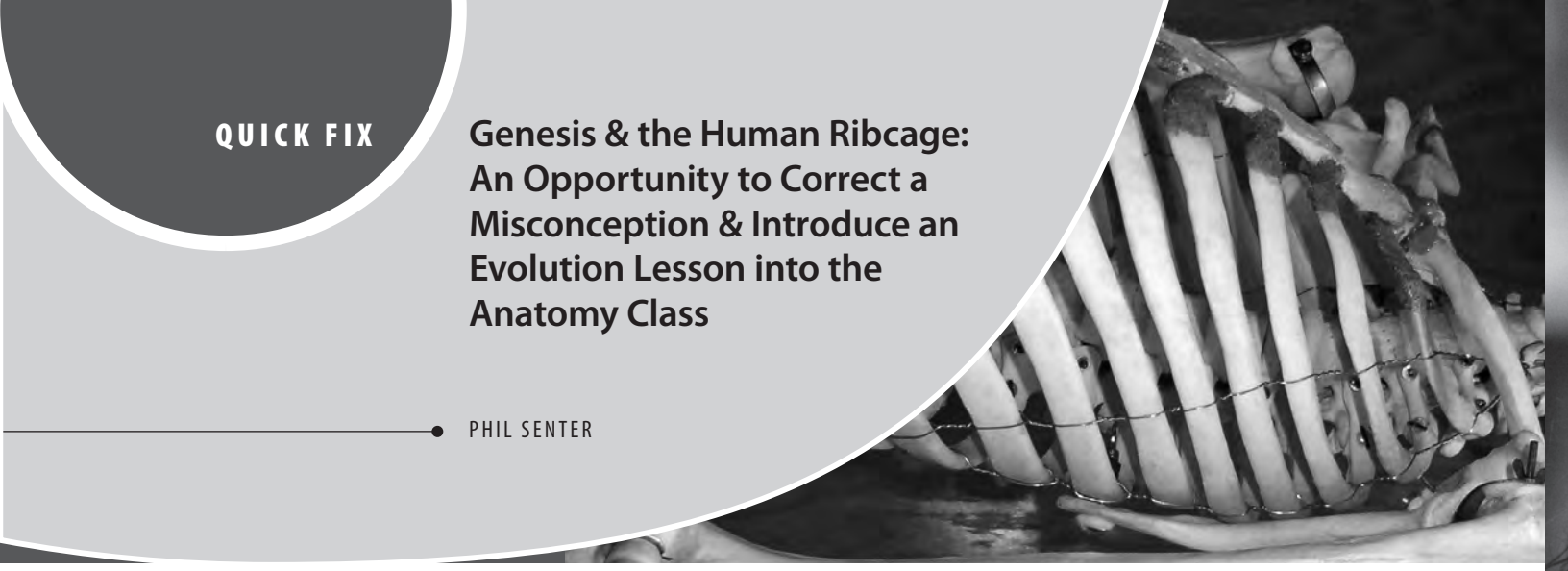
QUICK FIX

Genesis & the Human Ribcage: An Opportunity to Correct a Misconception & Introduce an Evolution Lesson into the Anatomy Class



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Abstract

Many anatomy students begin the course with a misconception that human males and females do not have the same number of ribs. At the root of that misconception is Genesis 2:21–22, in which God removes a rib from Adam to make Eve. Removal of a body part is a surgical procedure, and one does not pass on the results of surgery to one's offspring. The prevalence of this misconception is therefore an opportunity to discuss Lamarckian inheritance in the classroom.

Key Words: *Book of Genesis; anatomy; human ribcage; Lamarckian inheritance.*

Many first-time anatomy students begin the course with the notion that the number of ribs differs between human males and females. The origin of this popular misconception is the story of the creation of Eve from Adam's rib in Genesis 2:21–22. Because of this story, many people believe that men have fewer ribs than women.

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A few years ago, after learning that 12 pairs of ribs are present in humans of both sexes, one of my anatomy students raised her hand and asked, "So the Bible is wrong?" Despite my personal, non-literal interpretation of this passage, I could not in good conscience misrepresent the fact that at least in this case, anatomy was compatible with scripture. As I told the student, this is because rib removal is a surgical procedure, and surgical results are not heritable. Later, it occurred to me that the subject could be used to incorporate an evolution lesson into the anatomy classroom via discussion of Lamarckian inheritance.

I now broach the subject myself when we cover the human ribcage in anatomy class. I tell the class that human males have 12 pairs of ribs and ask the class to vote on the number of ribs they think are present in human females. Very few vote for 12. The consensus is usually a split between 11 (which suggests that even the Biblical loyalists in the class might not have really thought the question through) and 13.

This presents two educational opportunities. First, there is the opportunity to undo a common misconception by letting the class know that 12 pairs of ribs are present in humans of both sexes. Second, there is the opportunity to discuss evolutionary mechanisms by connecting the rib misconception with Lamarck's theory of inheritance of acquired characteristics. Jean Baptiste de Lamarck proposed this mechanism for evolution in the early 1800s, and discussion of it is a standard part of most biology textbooks (e.g., Starr & Taggart, 2004; Campbell et al., 2008). Lamarck proposed that bodily changes that organisms acquire during their lives are passed on to their offspring; for example, giraffes stretch their bodies to reach high branches, and longer necks and forelimbs are passed on to the next generation (Volpe & Rosenbaum, 2000). It takes little discussion to resolve that inheritance of acquired characteristics does not occur in multicellular organisms. For example, in human lineages that have practiced circumcision of newborn males for thousands of years, males are not born without foreskins (Volpe & Rosenbaum, 2000). Incidentally, Lamarckian inheritance does occur in unicellular organisms, because when they acquire genomic mutations, those genetic changes are passed on to their descendants (Prothero, 2007).

The rib misconception is an example of Lamarckian thinking, and the impossibility of passing on surgical results to offspring is an example of the falsification of a scientific hypothesis (inheritance of acquired characteristics) through observation. Discussion of the popular misconception about the human rib count therefore provides the opportunity to draw more discussion about scientific methodology into the anatomy classroom than is typically covered therein.

References

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