



FIGURE 11.6. Evolutionary history of the *Hox* gene complex in metazoan phyla. The common ancestor of the phyla shown here probably possessed at least eight *Hox* genes organized into a single complex. Various expansions of the complex have occurred in multiple lineages. For example, an expansion of the Posterior group appears to have occurred early in deuterostome evolution, and several duplications of the entire cluster occurred during vertebrate evolution, which led to four clusters (a, b, c, and d; note that some *Hox* genes are absent from some of the clusters because of gene loss after duplication) on four different chromosomes. The precise evolutionary relationships for the Posterior class genes and the *Hox6*, *-7*, and *-8* group genes between phyla are still unresolved (e.g., independent duplications may have led to *Hox7* and *-8* in deuterostomes and *Antp* and *Ubx* in protostomes). The coloring pattern shown here for these genes is an oversimplification.

11.6, modified from Carroll S.B. et al., *From DNA to Diversity: Molecular Genetics and the Evolution of Animal Design*, 2e, p. 115, © 2005 Blackwell Publishing