I would like to point out that crocodilians can gallop (*2*) and, therefore, asymmetrical gaits are not unique to mammals.

This observation should not detract from either Gambaryan's thesis on mammalian locomotion or Cartmill's critique. However, since crocodilians are survivors of a once major archosaurian radiation, this observation bears on the currently popular question of the extent to which archosaurian reptiles, particularly dinosaurs and their descendents, converge on mammals. Bakker (*3*) has amassed data to show that dinosaurs were active, cursorial homeotherms and apparently believes certain quadrupedal forms galloped (*4*). Gambaryan derives bipedal mammals from ancestors with high-speed, asymmetrical gaits. Certain recent reconstructions of ornithischian dinosaurs present generalized forms as fast-moving, highly active bipeds (*5*); the once-accepted image of dinosaurs as slow, lumbering beasts is fast fading. Furthermore, both Bakker and Ostrom (*6*) derive birds directly from saurischian dinosaurs and Ostrom conceives of *Archaeopteryx* as a "very active, fleet-footed, bipedal, cursorial predator." Vestiges of asymmetrical gaits not only occur in crocodilians, but can be seen in modern birds during take-off.

If asymmetrical gaits have been important in the evolution of the Mammalia, they must also have been important in the evolution of the Archosauria.

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References and Notes

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"Ecology": A Clarification

It is quite true that the history of ecology is largely unstudied, but R. Goodland (Letters, 25 Apr., p. 313) does not clarify the history of ecology with his assertion that Henry David Thoreau, rather than the zoologist E. H. Haeckel, first used the word "ecology." This misunderstanding was explored some years ago in the pages of *Science*. Walter Harding, a well-known Thoreau scholar, had transcribed (*1*) a handwritten letter from Thoreau to his cousin Henry Thatcher, which is the source of the quotation—including the word "ecology"—to which Goodland alludes. P. H. Oehser (*2*) followed Harding in ascribing the word "ecology" to Thoreau. Subsequently, Harding reviewed his transcription of the Thoreau letter and stated (*3*) that the word he had earlier read as "ecology" was actually "geology."

The science of ecology had very diffuse origins in botany, zoology, oceanography, limnology, and various aspects of natural history and applied biology, and it is impossible to attribute its founding to one individual. Ecologists do not generally assert that Haeckel was the founder of ecology. There is, however, general agreement that he coined the term "oecology," recognizing it as a logical subdivision of biology, that he provided a reasonably usable definition, and that he first used the word in 1866 or 1869.

It is clearly the case, as Goodland states, that ecology as a formal, named aspect of biological science owes much to J. E. B. Warming and also to other European botanists: O. Drude and A. F. W. Schimper published extensive studies on "Oecology" in the 1890's and stimulated interest in ecology in the United States, especially on the part of C. E. Bessey and J. M. Coulter and their respective students F. E. Clements and H. C. Cowles. The pages of *Science* (*4*) provide a detailed exchange of letters concerning the origin, etymology, meaning, and proper spelling of oecology or ecology.

Depriving Henry Thoreau of whatever honor there may be in being the earliest user or coiner of the word ecology does not deprive him of the very proper recognition of his role as a pioneer ecologist (probably before the word existed) who clearly recognized the ecological concept of succession (*5*) and who is commonly described as the father of phenology (*6*), an important facet of ecology dealing with the chronology of natural events.

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