and

EVLUTION (third edition), Monroe W. Strickberger, 2000, Jones & Bartlett, Sudbury, Massachusetts, Jones & Bartlett, 721 pp., hardcover $83.95.

Did paleontology ever sit at the high table? In the 1970s, paleontology began to shake its status of sub-
servience to genetics and Neo-Darwinism, and proclaim that the fossil record itself could be observed in lab mice or Galapagos finches. At the 1980 Chicago conference, paleontology's chal-
lenge to the hegemony of the fruit flies first made an impact. During the 1980s, the importance of stasis as an unexplained phenomenon began to have an effect on the Neo-Darwinian orthodoxy, and the hierarchical thinking that led to models of species sorting were de-
veloped and published. In 1984, one of the doyens of the Neo-Darwinians, John Maynard Smith, wrote, "Pa-
leontologists have too long been missing from the high table. Welcome back" (Nature v. 309, p. 462). It seemed as though paleontology was finally going to be a major player in the community of evolutionary biology, and take part in the societies and journals (such as Evolu-
tion, founded in part by paleontologists) that had long been the domain of geneticists.

The year 2002 marked the thirtieth anniversary of the Eldredge and Gould punctuated equilibrium pa-
paper, which profoundly changed the way paleontology works. So much so that debates about the relative im-
portance of punctation have ceased, and recent pa-
pers in journals like Paleobiology take stasis and punc-
tation for granted, and rarely mention gradualism.

Among paleontologists, the punctuated equilibrium pattern is now assumed as given, and the controver-
sies have now moved into areas regarding macromolec-
ular patterns and processes, coordinated stasis, mechanisms for evolutionary explosions, and the ran-
dom effects of mass extinction events on otherwise well-
adapted organisms.

Robert Bakker of the University of Tennessee made the case that the missing link of the evolution of land animals was a large carnivorous dinosaur. Paleontologists have justifiably criti-
cized this as a lack of evidence, however, and will be

So how effective was the paleontological revolution in changing the thinking of orthodoxy Neo-Darwinians? Since their major points of attack were evolution and stasis, these have been the main targets of the paleontological literature. As we will see, evolution has been given a free ride, and paleontologists have been forced to retreat to the high ground of stasis.

Perhaps the most revealing barometers of the think-
ing on evolution are the books that appear in the main stream of paleontology. Two of the most widely used are Strickberger's Evolution (now in its third edition) and Levinton's Genetics, Paleontology, and Macroevolution (already in its second edition). Since 30 years since the debates began, these books have had a chance to digest what paleontolo-
gists have been saying, and modify their strict Neo-
Darwinian views to a "new and general theory of evolu-
tion" (as Gould suggested in 1980).

However, a closer examination of both books is pro-
foundly disappointing for paleontologists. Strickberger's book was first published in 1990, but it could have been written in the 1960s. It takes the student through all the basic topics in history of evolutionary thought, genetics and molecular evolution, and then a phylum-
by-phylum tour of the animal kingdom that assumes the student has had no previous exposure to the study of groups of animals or plants in basic biology. Punctu-
ated equilibrium rates only half a page (p. 599-600), and even this mention completely misses the point of all the arguments of the past 30 years, dismissing the debate as a minor quibble about rates of speciation. Even more disturbing is the antiquated level of present-
ation of the major topics of animal evolution, with dia-
grams after diagram that have long been abandoned by paleontologists familiar with the cutting edge of re-
search. For example, the "hypothetical ancestral mol-
date" makes a surprise reappearance (p. 377), the idea that jaws are modified pill arches (long discounted in vertebrate paleontology) is still promulgated (p. 462), the ancient division of Reptilia into four subclasses based on temporal fenestrae reappears (p. 420), with the even more outdated notion that Synapsida ("mam-
mal-like reptiles") had anything to do with the Reptilia as now defined; archaic ideas of Mesozoic mammal evo-
lution also are featured (p. 440); and scattered through-
out are outdated wasterbaske t taxa (such as "Eupantotheca," "Agathisia," and "Thecodontia") and 30-
year-old diagrams of mesosoric mammal evolution.

Punctuated equilibrium groups that show no relationship at all—each taxon independently arises from some paraphyletic ancestral group as if the past 30 years of phylogenetic studies have learned nothing. Symptomatic of this outdated approach is an image that has gotten a little older, a photograph of the lower right corner of each odd-numbered page, which form a flip book, showing a primitive tetrapod crawling out on land to catch insects. As explained on the title page, this reflects the way myopod amphioxus grade up from the water to escape predators or catch new prey—
but completely ignores all the new evidence from Amniota and other recent finds that suggest most-
legged animals evolved their limbs while remaining fully aquatic, and not in response a need to crawl up on land.

If Strickberger's book is clueless because it is in-
terested in beginnings, almost unaware with much background, Levinton's is clueless at the advanced level. It is clearly aimed at the graduate student and profes-
sional, but it still misunderstands the fundamental nature of the punctuated equilibrum made by paleo-
tologists. Page after page, it talks on paleontological tone to defense of Neo-Darwinism, completely ignoring the con-
cepts that important things have been learned. For ex-
ample, Levinton's coverage of punctuated equilibri-
um debate either selectively chooses examples that support his biases, or focuses on gradualistic studies that have long since been discounted—completely mis-
representing the general consensus among paleontolo-
gists that gradual change is real, and that punctua-
ted stasis are real and important phenomena. And where paleontology has fundamentally changed the way we
see evolution, his "pseudointellectual" conveniently re-
writes the past as if Neo-Darwinism saw it this way all
along. For example, he states (p. 148) that until was
the expectation of the antiquity for many years, but
this comes as a complete surprise to most of us who
are familiar with the normal way evolution is taught for
even how some of his contemporaries, such as
Brückner, presented old-fashioned Neo-Darwinism as
pseudointellectual (and adulation). Even Mayr (1992,
in The Dynamics of Evolution, A. Sossi and B.A.
Peterson, eds.) conceded that the prevalence of "pass-
was a surprise to the Neo-Darwinians and could not
be easily explained by neoclassicists. Yet the real para-
dox is not just that species is prevalent, but that it oc-
curs even in the face of environmental change that Neo-
Darwinism would argue demand morphological change
The stated "escape clause" of stabilizing selection does
not apply here—those environments are clearly chang-
ing rapidly, yet organisms fail to respond to these dra-
tic environmental fluctuations. Reading Leavens' book
provides almost the same sense of frustration that
 reading a creationist book does. Leavens' lack of first-
hand experience with fossils and what they really show is
readily apparent. If he had wrestled with the fos-
dilemma posed by paleontology with a more open mind, it
would be fair, but as he reveals from the opening pages,
his biases are clear and he is not to discredit those who
would challenge the Neo-Darwinian orthodoxy. Such
positions may be indefensible in court, but such close-
mineness and lack of firsthand familiarity with the
facts are not conducive to breaking through the confi-
sion and find a newer, better theory of evolution.

If these books are representative of what
neoclassicists think of the paleontological record, then
they may have inflicted any real effect on their worldview,
and have not taken a seat at the "high table." Now that
Gould is gone and few of us have an impact on them,
will there be any future hope that our discoveries and
viewpoint will affect the evolutionary biology textbooks
of the future?

Donald R. Prothero
Dept. Geology
Occidental College
Los Angeles, CA 90041