

Truly A Wonderful Life

Review of : Gould, Stephen Jay, 1989, *Wonderful Life: The Burgess Shale and the Nature of History*, W. W. Norton & Co., New York, NY, 347 p., \$19.95.

by Kurt P. Wise

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During my graduate school years, I often had to support myself by working as a landscaper. That gave me substantial firsthand knowledge of the unpredictability of weather. It thus came as no surprise to me when I learned that chaos theory was first elaborated in the field of meteorology.

Chaos theories--currently the rage in physics--were not designed to explain the orderly nature of chaos. Rather, chaos theories attempt to examine the chaotic nature of order! They attempt to look at the chaotic element of not only weather, which is notoriously unpredictable, but predictable phenomena like the orbits of planets. Indeed, both the weather and planetary orbits are equally well fit by theories of chaos. If all things were not so precisely determined by God, we might say "Play it again, Sam," and things would turn out quite differently. So many small, seemingly insignificant events contribute to a planet's orbit or the course of a storm that, if replayed without supernatural guidance, cosmic history might well have left our sun with only five planets (or three, or twenty) and the replay of meteorological history might have led to hurricane Hugo missing the Carolina coast altogether.

Though he never explicitly mentions chaos theory, Stephen Jay Gould has introduced it into what he calls the gentle field of paleontology--i.e. the study of fossils. His latest book, *Wonderful Life*, is primarily a discourse on what Gould calls the contingency of evolutionary history. If the evolutionary "tape" were played again, there is no way to predict what would happen--and no reason to expect that humans would have existed. In other words, chaos theory may also fit evolutionary history, just as it does cloud growth, planetary orbits, and scores of other events of an apparently orderly nature.

The empirical example Gould uses to develop his contingency argument is what he describes as the Burgess Shale drama--a drama outlined in chapters two through four. Chapter three contains descriptions of the 'exquisite loveliness' of two dozen or so strange animals, found as fossils in a small quarry near the Burgess Pass in the mountains of British Columbia. Truly they are exquisite. These Burgess organisms exhibit the strangeness expected in science fiction rather than science description. Gould places his descriptions and the associated drama of scientific discovery in his central (third) chapter. This chapter takes up half the book. As a paleontologist, I found this chapter at least as fascinating as the remainder of the book. Other

reviewers, however, have found this chapter bogged down by too much jargon. And at least one reviewer (erroneously, I think) found the chapter boring.

The second and fourth chapters surround the Burgess descriptions with background on the Burgess story. Chapter two provides the reader with the setting of the Burgess fossils--the importance of the Burgess in both the fossil record and evolutionary theory, and the means by which the fossils were preserved and discovered. Chapter four is an attempt to explain why Charles Doolittle Walcott, whom Gould believes to be the foremost scientist/administrator of America's history, so seriously misinterpreted the Burgess fossils.

The first and last (fifth) chapters elaborate most of Gould's musings on the contingency of evolution--or what I have called the chaotic nature of evolutionary history. Although undisturbed when told that weather patterns are chaotic, many become uneasy when told that our origin is also fraught with the uncertainties of a chaotic pathway. Gould asserts that with the acceptance of scientific orthodoxy, the idea of a creation fashioned for the purpose of man has been completely obliterated. Astronomy relegated the earth to an unspectacular third position among nine about an average star located near the fringes of an average galaxy in an unspectacular galactic cluster. Evolutionary biology declared man to be nothing more than a sexually mature, upright, juvenile ape--one lineage among thousands and one animal among millions. Radiometric dating reserved for man only the last one forty-thousandth of the earth's history. And, lest some view evolution as a steady, inevitable pathway to human intelligence, Gould argues differently. If, as Gould argues, the evolutionary tape were played again, human life would not be expected. In fact, even if it were replayed a million times or more, man would not be expected again.

To conclude, as Gould does, that man is "...a wildly improbable evolutionary event..." (p. 291), "...a detail, not a purpose..." (p. 291), and "...a cosmic accident..." (p. 44) is disconcerting to some, but not to Gould. To him, release from any purpose is 'exhilarating' as it also releases any responsibility to any other, "...offering us maximum freedom to thrive, or to fail, in our chosen way" (p. 323). If ever evolutionary theory has been elaborated to the point of complete incompatibility with a Christian world view, it is by the pen of Stephen Jay Gould in this, his most recent tome.

I would like to introduce two implications of Gould's work (not specifically addressed by him) for those who believe in the Bible. First, consider the subject of accommodation. Over the years theories of accommodation which try to reconcile Scripture and macroevolutionary theory. According to some of these theories, God fashioned man 'from the dust of the earth' via the process of macroevolution. As Gould explains so well, however, a scientifically orthodox understanding of earth history includes many facts that are at odds with the idea that man was a purposeful product of the evolution. Why is it, for example, that for two thirds of the history of the earth, life proceeded no further than bacteria? Why is it that for half of the remaining one third of earth history, life remained one-celled? What is to be made of the possibility that two unsuccessful attempts at multicellularity preceded the one that finally initiated the line to humans? Why was the evolution of mammals delayed for 100 million years by the parenthetical note of the development, domination, and demise of the 'terrible

lizards'? Why is it that it took 99,999 out of the 100,000 units of time in the history of this universe for man to come about? And finally, if man is in God's image, does God look like the ape who bore us? Although not expressly designed as a polemic against theological theories of accommodation, Gould's arguments nonetheless bear upon them. The very nature of God comes into question if He chose evolution as a means to form man. The literal reading of the macroevolutionary history of the earth is that man is an accident--at best an afterthought of nature's process.

The second implication that I would like to consider has to do with the second 'great problem' posed by the Burgess organisms (the first being the chaotic nature of macroevolutionary history). In particular, "How did the diversity of the Cambrian (the Burgess and similarly aged animals) arise in the first place?". The rocks older than the Cambrian lack organisms ancestral to most of the Cambrian animals, but do not lack the ability to preserve the animals, if they ever existed. As Gould reflects, the origin of the Burgess is a challenge to current evolutionary theory. Gould includes in his book a brief discussion on how this unknown evolutionary mechanism might work. To aid the reader's understanding, Gould creates the metaphor of the 'Great Token-Stringer' who constructs the Burgess organisms by stringing together organismal features chosen at random from an orderly grab bag of goodies. Though it is only introduced as a pedagogical tool, it is interesting that the most natural and easily understood mechanism for the origin of the Cambrian chimeras is a being of remarkable manipulative ability and power. Though that is by no means what my mentor intends in this book, I do see reasons to believe that Gould's chimeras are constructed not by the hand of evolutionary theory but by the loving hand of an omnipotent and all-knowing God.

Though not an easy read, Gould's *Wonderful Life* is a worthwhile volume. In it one meets a great thinker and can ponder with him some of the most disturbing philosophical implications of evolutionary theory.