

BOOK REVIEWS

FULL HOUSE: THE SPREAD OF EXCELLENCE FROM PLATO TO DARWIN

STEPHEN JAY GOULD, 1997

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Stephen Jay Gould sets down, in four short parts and an epilog, some central problems in how variation and progress are perceived. These two underlying themes are expounded upon and illuminated with novel examples. The first of these is the proposition of progress as *the* central tendency in evolutionary thinking from both scientific and folk models. Gould uses the metaphor of “Through a glass darkly” to describe the relationship between objectivity and subjectivity. Evolutionary trends are not, he asserts, “moving either up or down.” The cultural conception that *H. sapiens* epitomize the culmination of some driving force beyond evolution is detailed and contrasted with those successful life forms called bacteria.

The other theme is inextricably tied within the first but cast on its own. Variation is the reality in complex systems. Gould pushes for looking at the entire spectrum of diversity in order to understand variation. “...we should be studying variation *in the entire system* (“the full house” of my title) and its changing pattern of spread through time.” To illustrate these themes of variation and diversity and the seemingly paradoxical (and he would assert this comes from cultural conceptions) idea that complexity is necessarily synonymous with progress and perfection, Gould uses the extinction of .400 hitting in baseball and the successful history of bacteria as the “modal bacter”.

The book is divided into four parts. The first part gives the reader the general philosophical ideas of Gould’s work. The philosophical and theoretical construct of the Thomas Henry Huxley—the chessboard—portrays the heart of the scientific endeavor cast through and interpreted by a human instrument. “The chess board is the world, the pieces are the phenomena of the universe, the rules of the game are what we call the laws of Nature. The player on the

other side is hidden from us. We know that his play is always fair, just, and patient. But also we know, to our cost, that he never overlooks a mistake, or makes the smallest allowance for ignorance (From a Liberal Education, 1868.)

In part two, Gould tells of his personal experience with cancer. After discovering statistical “analysis” that individuals with his kind of cancer—mesothelioma—only live on the average 8 months, he began to despair. But, he realized, being an individual with his own uniqueness and variation, he did not have to buy into the idea that he would die within eight months. He showed that the eight month time span is only that—a statistical average with half of the individuals dying sometime before eight months and the other half after—he could go about doing what was best for him to be cured as *an individual* and being a part of the other side of the bell curve of cancer survivors.

In this section, he also writes about misconceived notions of the evolution of horses. The seemingly straight ladder of horse evolution from the earliest fossils with their multiple toes, small skulls and “monkey-like” dentition to large headed, single-toed creatures with changed dental patterns is better described as a “bush”. On this he states, “... , evolution proceeds by an elaborate and complex series of branching events, or episodes of speciation (technically called *cladogenesis*, or branch-making). A trend is not a march along a path, but a complex series of transfers, or side-steps, from one event of speciation to another (63).”

Gould outlines the popular misconception of the extinction of .400 hitting in baseball as a general trend that play in America’s Past-Time is becoming worse. By treating .400 hitting as a “thing” or an “entity”, this denotes “something has turned sour.” But, again treating trends within a complex system, Gould proves that play has not degenerated but actually improved. Hitter’s access to better facilities, better medical care and a general improvement of health by these players have increased from their historical counterparts. Thus, Gould concludes change within three other parts of the game stand in the way of .400 hitting: 1) BETTER PITCHING 2) BETTER FIELDING and 3) BETTER MANAGING. He also goes further and says these concepts are not enough to explain the phenomenon of the death of .400 hitting. He makes two statements regarding this:

1. *Complex systems improve when the best performers play by the same rules over extended periods of time. As systems improve, they equilibrate and variation decreases* (112).

No significant rule changes have occurred in baseball history and this coupled with new strategies developed within this system of rules will have a “net result through time...an ever-closer approach to optimal performance in all aspects of play—combined with ever-decreasing variation in modes of procedure (112).” Players become more adapted and deviation decreases.

2. *As play improves and bell curves march toward the right wall, variation must shrink at the right tail (116).*

The maximum performance of any player cannot exceed the right wall. In any given population, the case here being baseball players, as averages stay the same, general improvement also incurs in the system as a whole while the right wall in this bell curve stays put.

In the last section, Gould discusses the successful careers of bacteria. The notion of humanity as being the ultimate expression of life on the planet is viewed in contrast with how bacteria, the oldest life-form, have come to occupy virtually every ecological niche on the planet. Their numbers are extraordinary and incalculable and without them, other life, such as humans, would not be around. The successful life-history of bacteria demonstrates that life on the planet is *not* being pushed for complexity as a whole.

Gould’s epilog on human culture brings to bear some insights into the mechanisms for cultural change. Operating on entirely different principles of inheritance than biological evolution (Darwinian vs. Larmarckian), Gould discusses progress and the movement toward the right wall in three areas of human culture: science, the performing arts and the creative arts. Science has yet to grow toward this right wall of complete knowledge taken in its totality but human performance, certainly in competitive sports, is reaching the end of expansion. Human creativity, a fundamental aspect of human culture, is varying only because certain novel approaches (and here he gives examples from classical music) are being used and rewarded for and thus not all of what can be created is being perpetuated.

Gould opens up important issues for students of evolution in general and in the biological sciences specifically. By viewing humanity in its place in the evolutionary stream and with its variability and uniqueness and NOT as an inherently perfect “thing”, we can understand and appreciate how lucky we are to be part of the cosmic chess-game.

