

BOOK REVIEWS

TITLE NEEDED

The Genesis of Animal Play: Testing the Limits. By G. M. Burghardt, Cambridge, MA: MIT Press, 2005.

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As readers discover that play is deeply rooted in biology, yet not understandable without a mental space in the player, this book could be titled, *The Paradoxes of Play*. To anybody, play is essentially human distraction and enjoyment. But who has not seen a companion dog playing to retrieve a stick thrown by the caregiver? It is thus obvious that play is not limited to humans. The question of when play started in the nonhuman animal kingdom therefore comes immediately to any curious mind. That is the problem tackled in this book. The question may seem simple at first sight, but Burghardt shows that it is in no way so. Indeed from chapter to chapter, readers will discover several paradoxes, the first of which is that there is no definition of play.

Burghardt then offers his own definition, an indirect one. For him, play is a behavior that satisfies the five following conditions:

1. Being useless on first examination—not contributing to survival.
2. Being pleasurable.
3. Resembling “normal” behavior, but somewhat different.
4. Repeating during the life span.
5. Taking place when the player is stress-free and has no other motivation.

Because Burghardt is a scientist, he builds on his predecessors’ contributions: among them—the readers will perceive in underlying filigrane from chapter to

chapter—the Darwin and Tinbergen frameworks. Darwinism asserts that if a characteristic is transmitted through generations it is because natural selection privileges useful traits. Play, then, must be useful. However, Burghardt makes clear that to be play a behavior must be useless, and thus its presence cannot be explained by mere natural selection. Tinbergen defined ethology—the science of behavior—as a study from four points of view: causation, adaptiveness, ontogeny, and evolution. In the case of play behavior, Burghardt adds a fifth one, private experience; that is, enjoyment or pleasure, which implies the existence of a consciousness in the player.

The juxtaposition of the preceding definition with both Darwin and Tinbergen's approaches thus generates a double paradox:

1. If game is a useless activity, then one does not see why it may have been transmitted in evolution through millions of years.
2. If we may accept easily the existence of consciousness in fellow humans and also in other mammals, it is difficult to think that a shrimp, who apparently plays, possesses consciousness and experiences pleasure.

This author is well aware of these paradoxes and does not shun the difficulty. On the contrary, he nourishes the sequence of chapters with his own thoughts on them. He does not hesitate to quote doubting colleagues when it comes to invertebrates or lower vertebrates. Yet, in his systematic exploration of the phylogenetic tree, he presents the available evidence and draws prudent conclusions.

Is there consciousness below reptiles? The author's broad and systematic review of the literature shows that a positive correlation exists between the relative size of the cerebellum and the presence and sophistication of playlike behavior, especially in fish. Such a correlation may be a key to solving the second paradox, at least in the case of lower vertebrates. The cerebellum is the locus within the central nervous system essentially involved in motor control and not mental functions. Thus, a large cerebellum may allow play that would take place without the prerequisite of consciousness in the playing animal.

All students of evolution will be interested in reading this book, for it is time to incorporate behavior in the study of phylogeny. The readers will find a very rich literature review. At a time when—due to only recently built informatics bibliographies—fierce competition for financial support leads too often to shunning of anterior papers by competitors, ancient contributions are, alas, often ignored by newcomers or unethical authors. Burghardt's honest and broad erudition will therefore be a treasure for all those interested in evolution as well as in play behavior. Yet, he does not limit himself to such honest, thorough reviewing of other authors' contributions, but he presents his numerous contributions and nourishes every chapter with his deep thoughts about the problem.