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Journal
Religion Brain & Behavior, ahead-of-print(ahead-of-print)

ISSN
2153-599X

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Publication Date
2022

DOI
10.1080/2153599x.2022.2143409

Peer reviewed

RELIGION, BRAIN & BEHAVIOR
https://doi.org/10.1080/2153599X.2022.2143409

COMMENTARY ON DAVID SLOAN WILSON'S Target Article "REINTRODUCING PIERRE TEILHARD DE CHARDIN TO MODERN EVOLUTIONARY SCIENCE"

Conscious evolution of the noosphere: hubris or necessity?

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In his target article David Sloan Wilson reframes the evolutionary thought of Pierre Tielhard de Chardin in terms of the current advances in evolutionary theory. He argues that recent advances in evolutionary thinking are vindicating much of Tielhard's grand evolutionary vision. This is a challenging task because it requires an effort to both bring the reader up to date with our now greatly extended understanding of the complexity of evolutionary processes and also requires recontextualizing some of Tielhard's long-rejected evolutionary speculations.

Tielhard's approach to evolution was not focused on the process of natural selection or other mechanisms driving evolutionary change, but rather on the level of the whole of the evolution of life. From this macro-evolutionary perspective the history of Life appears unambiguously directional. For the first two billion years of life on earth all organisms were probably not much more complex than the bacteria alive today. Only in the last billion years or so have complex cells evolved. And only in the last half a billion years have complex multicellular organisms begun to spread throughout the sea and land.

Viewed from this cosmic perspective it is obvious that there is an evolutionary trend from small and simple to large and complex. But only within the past few decades has it become clear that a strict reliance on classic neodarwinian theory is insufficient to explain this regular increase in complexity. Even today, alternative competing theories are offered to explain how these major hierarchic transitions in complexity emerged, and a full explanation may still be decades away. Nonetheless, as the target article amply demonstrates, current advances in evolutionary theory are beginning to rehabilitate some of these macroevolutionary speculations, providing new support for an intrinsic directionality to evolution.

By the late 1990s these debates converged with the recognition that selection could operate at many levels at once: multilevel selection. It became apparent that major hierarchic evolutionary transitions, producing higher order units of selection, resulted from the evolution of stable cooperative relationships between once autonomous lower order organisms nested within each other like Russian dolls within Russian dolls. But this implied that similar evolutionary principles might apply at higher levels as well, including human social and technological evolution. This is where Tielhard's vision may have been prophetic.

Central to Tielhard's vision is the idea that humans are fundamentally unique among species in the ways they are able to communicate and share their thoughts. Although communication between organisms is the rule—from bacteria to chimpanzees—human communication is unusual. Rather than being directly linked to its context by similarity (icons) as in the aposematic coloration of poisonous butterfly wings or by immediacy (indexicality) as in a cry of pain, human language refers symbolically (in which the sign vehicle such as a word is only linked to what it is about by shared social convention). This "displacement" from its reference has freed up communication and thought from the limits of concrete association.

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Paradoxically, this ungrounding from pragmatic context has made it possible to share what no other animal can: one's thoughts, memories, intentions, and experiences. But precisely because symbolic communication is ungrounded it is also entirely dependent on shared interpretive habits. We humans have access to this unprecedented social and mental tool because we are born into a social group that shares the same symbolic habits. Symbolic communication in the form of language is the glue that coordinates and maintains social cooperation, but it is only available to those who are embedded in a cohesive social group large enough to have developed and preserved these capacities. As a result, human nature has evolved mental adaptations to both more easily acquire this unusual capacity and to maintain the social cohesion that is essential for transmitting its content. In this sense, humans are like obligate endosymbionts that cannot flourish outside this larger social organism. We might therefore describe ourselves as a symbolically eusocial species. Although unlike the eusocial ants or termites, we are capable of reproducing outside of this super-organism, we are incapable of normal human thought if not reared within a symbolically integrated social group.

In this regard, Tielhard's concept of a noösphere can be seen as a natural extension of this essential defining feature of human symbolic nature. My thoughts are not entirely my own, and are (in this present context) inextricable from thoughts once expressed by this visionary Jesuit priest turned evolutionist. But this irreversible interpenetration of our mental worlds and the inextricable codependence it requires are now being rapidly exponentially modified by electronic media and computational prostheses. Today's noösphere involves vast millions of minds spread throughout the planet sharing their thoughts in fractions of a second. As a result, we have become ever more deeply dependent on and manipulable by these extensions of the now global noösphere. Extrapolating this trend do we envision a future hive mind or an egalitarian paradise?

This leads to the practical message of the target article: How might these insights from evolutionary theory contribute to the realization of a more cooperative and universally shared mental unity of humankind? Can we glean some critical insights from examples of cooperative hierarchic transitions in evolution that might aid in an analogous human transition? Citing converging research on the structure of cooperative higher order units in biological evolution and highly successful cooperative human groups, Wilson offers a recipe for guiding this potential transition. This highlights a key element of Tielhard's vision that is a core motivation behind this target article: the concept of "conscious evolution." In other words, unlike every other major hierarchic transition in the history of Life, can we humans learn from past major transitions and use this knowledge to guide the development of a global human noösphere.

I am wary, however, of the way this might blur the distinction between design processes and living processes. Designed artifacts are assembled from parts in a configuration that will hopefully function as predicted when completed. Often this requires extensive trial and error and entails innumerable unintended consequences that may not show up until too late to correct. Living organisms, in contrast, are holistically integrated. Their component structures are not assembled, but differentiate from previously less differentiated antecedents. And they must function incessantly as they differentiate and adapt to their immediate environments. It is this inverse logic that gives me pause.

Though natural selection is often caricatured by Herbert Spencer's phrase "survival of the fittest," and was compared to selective breeding by Darwin, both analogies are deeply flawed and misleadingly confuse evolution with design. Organisms adapt holistically, not with respect to isolated traits, but with respect to how the synergy of their functional organization "fits" with their local context. "Selecting" particular desired biological traits is, of course possible, as domestication amply demonstrates, but the results are seldom as robust as in the wild and are sustainable only with extensive artificial supports.

So conscious evolution, if understood in design terms, is an oxymoron. And a potentially dangerous one at that. The question is not how we can use insights from evolution to design a

beneficent human superorganism, but rather how we can use our knowledge of the evolutionary process to prevent the spontaneous evolution of a superorganism that we would not want to be part of.

Disclosure statement

No potential conflict of interest was reported by the author(s).