

---

# Of Machines, Organisms, and Agency

STEPHEN L. TALBOTT

*This is a section from the middle of a longer article, “Can Darwinian Evolutionary Theory Be Taken Seriously?” whose publication date is uncertain as of this writing. For a link to that article, when it does appear, go to <http://BiologyWorthyofLife.org>.*

When we build a machine, we manipulate materials of the world so as to configure a set of causal physical relations adequate to our purposes. Following this configuration, the machine’s performance is shaped by those causal relations, so long as outside factors do not interfere. Everything “rolls along” within the pre-established physical constraints. Engineers and philosophers speak of the “initial conditions” — the original, designed arrangement — of the system, which then operates in a predictable fashion based on that arrangement.

Organisms are not machines.<sup>1</sup> They are not endowed with a set of initial conditions, after which they simply carry forward the mechanistic implications of those conditions. It is grotesque even to try to imagine a single-celled zygote determining in any machine-like manner all the subsequent growth and development leading to heart, lung, and intestine, or to oak, salmon, or tiger.

The organism is, moment by moment, establishing *new* “initial” conditions. It is as if a machine were being redesigned at every moment — or would be like that if the organism were machine-like. In actuality, the organism’s *life* is a continual “self-redesigning” — or, better, a self-expressing, or self-transforming. Its parts are not assembled once for all; they are *grown* on the spot during development, so that the functional unity of the organism — the way its parts play together, and even what the parts are — obviously must be changing all along the way. If the organism *were* machine-like, it would be a different, newly constituted and redesigned machine each time you looked at it.

So the organism possesses, or is, a power of *origination*. It constantly brings about something new — something never wholly implied or determined by the physical relations of a moment ago.<sup>2</sup> We could also think of it as a power of self-realization. The “design work” accounting for the organism is an activity inseparable from the organism’s own life. It is an expression of that life rather than a cause of it.

Machines and organisms, therefore, have this in common: whatever is *responsible* for orchestrating causal arrangements — initially, in the case of machines, or continually, in the case of organisms — cannot itself be *explained* by those arrangements. This single fact calls into question the entire

habit within biology of trying to explain the present purely as the consequence of material forces playing out of the past.

It’s true that biologists speak incessantly of mechanisms and of machine-like or programmed activity in organisms. But this is empty rhetoric. No one has ever pointed to a computer-like program in DNA, or in a cell, or in any larger structure. Nor has anyone shown us any physical machinery for executing such program instructions. Nor, for that matter, has anyone ever explained what constrains diffusible molecules in a watery medium to carry out elaborate operations, such as DNA replication or RNA splicing.

The complexity of these operations, the ever-shifting patterns of cooperation required from the molecules, the sequencing of steps in a prolonged narrative, and the attention to an ever-shifting context that says, “Head in this direction” under one set of conditions and “Head in that direction” under a slightly different set of conditions — none of this is governed by machine-like controls that coerce the molecules into their essential, infinitely varying, and context-sensitive roles in the larger narrative. Yet, despite the lack of controlling mechanisms, the achievement is vastly more sophisticated than any intricately choreographed, well-rehearsed performance by a ballet troupe.

## Limits of our understanding

How, then, do the organism’s self-designing, or self-expressing, intentions compare with our own purposive, engineering activity in designing machines?

There is a crucial difference between the two. We do not cause the parts of a machine to *grow* together; we *put* them together. Our own, one-time designing activity impinges on the machine “from the outside.” This is best understood by comparison with organisms.

As we have seen, the life of the organism is itself the designing power. Its agency is immanent in its own being, and is somehow expressed at the very roots of material causation, bringing forth this or that kind of growth with no need for the artifice of an alien hand arbitrarily arranging parts and causal relations this way or that. The choreographing is brought about, it would appear, from that same depth of reality where the causal forces themselves arise, not from “outside.” However we conceive this “inner” place, it is, at least for now, inaccessible to our own engineering prowess.

The limitations of our understanding of the causal and intentional processes in organisms should not surprise us. A great deal is currently hidden from us. We know very

little about what forms of consciousness and intention occur in the world. We find ourselves already baffled when comparing our own consciousness to that of an infant, a chimpanzee, a dog, or a crow. And we are no less frustrated when we try to trace the apparent continuity of our consciousness with subconscious impulses, instincts, reflexes, various “psycho-somatic” processes, and (the ultimate challenge) the consciously willed physical activity of our bodies, in which all those cellular processes so often considered “unintelligent” are clearly caught up as able co-participants along with our conscious intentions.<sup>3</sup>

Acknowledging our ignorance is as important as trying to nail down what we know, for it can help to spare us that perennial failure of understanding: the inability, or unwillingness, to recognize the boundaries of our understanding, followed by the refusal to imagine the range of previously unanticipated possibilities that might allow us to transcend those boundaries.

The upshot of all this? Clearly, the intelligence and intention at work in organisms — and in our own bodies — far outstrip any creative powers we can exercise in building things. We humans cannot yet approach with our conscious thinking and willing the self-expressive powers evident throughout the biological realm. Given the limitations of our understanding, it may be a dangerous thing merely to manipulate organisms we cannot yet comprehend.

## How to speak of intelligence and purpose

So what about the use of problematic terms such as “intelligence,” “purpose,” “intention,” and “agency”? Our own purposive activity in designing machines commonly involves a *conscious* play of volition (intention) and thought (intelligence). It is, relative to the creative powers at work in physiology, a rather *lamed* consciousness with limited powers of activity. But it is also a rather *free* consciousness, inasmuch as we can exercise it more or less at will upon true or false, healthy or unhealthy contents.

When, however, I refer [elsewhere in the larger article] to the organism’s intelligent agency, or its purposiveness, or its directed, goal-driven functioning, I do not imply anything equivalent to our own conscious purposing. But neither do I suggest something *inferior* to our particular sort of wisdom and power of action. If anything, we must consider organic life to be an expression of a *higher* sort of intelligence and intention than we ourselves can yet imagine achieving in the technological realm.

Rather than over-defining terms and transgressing the boundaries of my own understanding, I am inclined to leave the matter there. I will tend to use terms in the way we commonly use them, with the understanding that the reader will keep in mind the above considerations.

Given the scientific culture’s radical denial of the psychic and voluntary, I judge it better to err on the side of anthropomorphism than to encourage the usual dismissiveness of all interior reality.

In sum:

*Both machine and organism:* the intelligent agency responsible for configuring causal relations cannot be explained by those relations.

*Machine:* the designing activity occurs up front.

*Organism:* the self-expression (“self-design”) is life-long.

*Machine:* the designer’s intentions are brought to bear upon the machine’s parts “from outside.”

*Organism:* its intentional work is immanent within the organism itself; it is the organism’s own activity.

*Machine:* the artifact comes to exist as a result of designing activity.

*Organism:* the physical organism never *comes to exist*; its growth is always the transformation of an already existing and living whole.

*Machine:* its functioning can be described in terms of the lawful playing out of its designed structure. This reflects the intentions of the designer.

*Organism:* its functioning is a narrative of the organism’s own meaning, always with a creative element (bringing about something new).

One other note. Our recognition of intelligent and intentional productions does not require us to understand everything about their source. We have no difficulty distinguishing the significance of letters on a page from that of pebbles distributed on a sandy shore, even if we know nothing about the origin of the text. We can declare a functioning machine to be a designed object, whether or not we have any clue about who designed it. And if we find live, intelligent performances by organisms, we don’t have to know how, or from where, the intelligence gets its foothold before we accept the testimony of our eyes and understanding.

## REFERENCES

1. Talbott, Stephen L. (2014). “Biology’s Shameful Refusal to Disown the Machine-Organism.” Available at [http://natureinstitute.org/txt/st/org/comm/ar/2014/machines\\_18.htm](http://natureinstitute.org/txt/st/org/comm/ar/2014/machines_18.htm).
2. Holdrege, Craig (2016). “Creativity, Origins, and Ancestors: What Frog Evolution Can Teach Us,” *In Context* #35. Available at <http://natureinstitute.org/pub/ic/ic35/frog.pdf>.
3. Talbott, Stephen L. (2015). “From Bodily Wisdom to the Knowing Self” Available at [http://natureinstitute.org/txt/st/org/comm/ar/2015/bodily-wisdom3\\_28.htm](http://natureinstitute.org/txt/st/org/comm/ar/2015/bodily-wisdom3_28.htm).