

# Organisms as Processes

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For Aristotle, paradigm substances were Man and Horse. These were basic elements of ontology: while their properties could change, the individual things persisted through time. But while this metaphysical scheme works well enough for rocks or books, despite Aristotle's choice of examples it presents problems for organisms. Considering the wholesale change of properties and replacement of material in the passage from zygote to adult human, it is hard to see what is the individual thing that has exhibited this sequence of properties. Organisms that undergo major metamorphoses, like the transitions from egg to caterpillar to pupa and imago, only make the problem worse. Attempts to address this problem by appeal to a continuing essential property, for example genome sequence, fail for lack of a suitable property. Genome sequence, in particular, is neither unique to an individual, common to all the parts of an individual, nor sufficiently central to the properties and behaviour of the individual to serve such a purpose.

The solution to this problem, I suggest, is that we need to see organisms as more fundamentally processes than as things; more specifically, they are developmental processes maintained by a variety of metabolic processes. This move has a number of advantages. First, dissimilarity of properties and material constituents of different stages of a process are entirely to be expected. Second, increasingly widely accepted perspectives on evolution, notably *evo-devo* and developmental systems theory, treat the full life cycle, and the processes that drive the transitions through the life cycle (including reproduction), as the proper subject matter of the theory rather than any particular stage in the sequence. Third, a processual framework more easily accommodates the omnipresence of symbiosis, since entities can participate in a process to greater and lesser degrees and for specific periods of its existence.

There are of course, major problems with this approach. Most importantly, what is the relation of processes to things? My working hypothesis is that biological things should be treated as stabilised parts of processes: maintaining the stability of biological things typically requires a lot of work. So in contrast with the currently fashionable emphasis on mechanisms, which explains processes in terms of things, the processual framework should explain things in terms of processes. While it is often objected that it is impossible to characterise processes without referring to things which undergo changes, the strategy just indicated can solve this problem by allowing stabilised aspects of processes to function as the entities that undergo change or, equally important, resist change. Since fundamental physics seems arguably process-based rather than thing-based this strategy can plausibly be pursued all the way down. The fact that the things (stabilised entities) are constituted as such by processes in which they participate makes it clear that this is not a reductive pathway to fundamental physics, however. Importantly, being an entity turns out only to be properly considered a thing relative to a particular time scale.

The foregoing provides some very provisional thoughts about processes in general and biological processes in particular. Their provisionality points to the biggest problem with the project, that we lack a generally agreed and understood account of what a process is. The *locus classicus* in recent philosophy is Whitehead's *Process and Reality*, but this is generally considered extremely difficult and obscure, a fact that may actually have discouraged recent attention to process-centred philosophy. In this talk, anyhow, I shall urge that we need to give serious attention to this topic.