



# TIME AND SUCCESSION IN RELATION TO EMERGENCE

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1. THE theory of emergent evolution presents us with a peculiar problem regarding the reality of succession in time. Does emergence involve temporal sequence with regard to the members of the hierarchy of emergents? If not, on what grounds shall we believe that something 'new' or 'novel' has emerged out of the old elements?

This question is vital for emergent evolution. It may be suggested that taking the universe as a whole and with an infinity of time, what we observe is the co-existence of all the different levels of emergence yielding no proof for the temporal priority of any level. In this case the utmost that we should be warranted in affirming would be that, as between any two given levels, there was *difference* either in the content or the mode of relatedness, not *novelty* or *newness*. But the essence of the doctrine of emergent evolution is the incoming of the new. There are about half-a-dozen senses or more of the word "new" recognised by the *Universal Dictionary of the English Language*<sup>1</sup>, but of them only three are pertinent to our inquiry. The new means "not previously existing, appearing, produced for the first time"; or "previously existing, but only recently discovered or known"; or finally, "beginning a fresh stage in a series, following that which has gone before, succeeding". Even of these three senses, the second, as we shall see, is not the meaning to be discussed philosophically. Hence the first and the third alone are relevant to our discussion. The question consequently reduces itself to this: can a mere logical difference of content between two levels or systems convey by itself, without recourse to the concept of temporal priority or subsequence, the idea of newness? The question may be looked at in this way. Take two systems A and B. A contains, let us say, factors *p, q, r*, and B, *u, x, y*.<sup>2</sup> The mere difference in the contents of the two systems does not constitute newness or novelty. To say that *u* is different from *p* is not to say that *u* is newer than *p*. In order that the difference may constitute newness, what is said to be new in B should not have existed contemporaneously with the corresponding factor in A but should have come

<sup>1</sup> P. 772.

<sup>2</sup> Or these may be regarded as sets of factors in different stages of the same event or entity.

into being at a later moment or instant of sufficient span so as to form a distinguishable interval of time. If  $p, q, r,$  and  $u, x, y$  came into being simultaneously, none of them in either system can be said to be newer than any other. If on the contrary *after*  $u, x, y$  had existed for some time, let us say contemporaneously with  $p, q, r,$  B should later on develop  $z,$  this last factor would be new with regard to both  $u, x, y$  and  $p, q, r.$

Taking the universe as a whole and with an infinity of time, such priorities and subsequences may not, it is true, exist for observation, for in an infinity of time all the changes and differences that we now observe may be supposed to have already come into being. This, however, does not invalidate the possibility of such changes or differences having taken place in accordance with temporal priority and subsequence before observation began. It is not a question of *discovering* for the first time what might have been existing previously (the second sense of the word "new" noticed above), but the possibility of "all things existing together", or of some coming into existence *later* than others. The position according to emergent evolution is that some things must have come after others. And even now within our experience some sequences of this kind are plainly visible and bespeak the fact that 'old' and 'new' are intelligible only on the presupposition of such priorities and subsequences.

It may be said that the complex structure as such is not necessarily the later in time than the simple. Integration and disintegration of parts are processes that are going on simultaneously so that it is quite as possible for complex structures to appear first and then disintegrate into simpler elements as for simple parts to appear first and then integrate into complex wholes. In biology, for instance, the original complex pattern of the five-toed foot has been reduced to greater simplicity in the case of species such as the horse, the ox, birds, etc., because the five-toed foot would be ill-adjusted to these creatures' habitation. Again, it is the complex embryo as a whole that is given to begin with, and the parts or organs develop only simultaneously with one another and as parts of an already existing whole. That is, the physical conception of parts as necessarily existing prior to the whole is no longer a tenable conception in the light of facts revealed by the study of biological sciences.

The truth of this contention must to a large extent be granted. Indeed it is naïve to assume that complexity is always the criterion of evolution or that evolution is everywhere in a linear direction from the simple to the complex. Spencer's formula of evolution—"from relative homogeneity to heterogeneity"—thus requires modification. If complexity involves variety, then

must remember that variety must be granted to have already existed in the supposedly simple beginning. And if evolution does at all illustrate and work by the principle of survival, then it is by no means certain that complexity—what Spencer called “length and breadth of life”—is conducive to survival. But all these admissions do not militate against our view that a finite interval of time is necessary between any two stages of a thing in order that one of them may be recognised to be ‘new’ in relation to the other. Even supposing that the whole is given prior to the parts, it requires time for the parts to develop as parts from out of the inchoate whole and temporal sequences would then be illustrated. In fact, our thesis may be generalised and stated thus: Not only novelty, but *change* as such, of whatever character, presupposes the reality of temporal sequence of such a character that if A, B, C are events, and if B succeeds A and C succeeds B, then in the dimension of time, there is no transition from A to C or from C to A except through B, and if a fourth event D succeeds C, then there is no transition from A to D except through B and C. Even if it be demonstrated that the universe has not shown any signs of change even by a jot or a tittle ever since its appearance, the general thesis nevertheless stands that *if* change is to take place, temporal sequence as above described is necessary.

2. In face of this conclusion one of two arguments may be urged. It may be maintained that the universe, as a whole, has shown no change at all ever since its appearance. There never was a time, it may be said, when the universe did not contain all that it does now, and, in consequence, there has been neither noticeable addition to nor subtraction from the sum of things. I think it would be difficult to maintain this position, at any rate in the light of our present knowledge of the formation of solar and stellar systems, of the earth’s history, and of man’s appearance on earth. It is not therefore necessary to pursue this argument further. A more serious consideration to be urged against temporal sequence would be to deny the traditional conception of time as a continuous flow and to insist upon the essentially discontinuous character of time. It is this age-old superstitious obsession of time as an independent flow quite apart from particular events, it will be said, that is responsible for the common belief in time-length, its irreversibility, and its so-called relations of *before*, *simultaneous with* and *after*. If, on the other hand, we adopt the new mathematical philosophy of Russell, Whitehead and others, we are told, we shall discard these remnants of a rusticated philosophy and think only of discrete or epochal, and not continuous, reversible and not irreversible, time. Then there will be no before or after, *i.e.*, no temporal subsequence or priority. William James first gave expression to this new view in his *Some Problems of Philosophy*. According

to him we have "to treat real processes of change no longer as being continuous, but as taking place by finite, not infinitesimal steps, like the successive drops by which a cask of water is filled, when whole drops fall into it or nothing."<sup>3</sup> Whitehead voices forth the same conviction. "Temporalisation is not another continuous process. It is an atomic succession."<sup>4</sup> Again "Time is sheer succession of epochal durations. The epochal duration is not realised *via* its successive divisible parts, but is given *with* its parts."<sup>5</sup>

It is only this way of looking at time, it is held, that enables us to escape the antinomies of the completed infinite and of the infinite past time of which Zeno the Eleatic made such great capital as against the Heracliteans. The main point for our consideration here is that the steps, parts, the atomic wholes, the epochal durations, of which temporal process is said to consist, are supposed to be themselves divisible into proper parts. Whitehead, for instance, writes: "Thus time is the succession of elements in themselves divisible . . ."<sup>6</sup> "Time is sheer succession of epochal durations . . . the divisibility and extensiveness is within the given duration."<sup>7</sup> And yet these proper parts are believed to be not mutually successive but mutually simultaneous. The epochal duration, for Whitehead, is realised, not *via* its successive divisible parts, but as given *with* its parts. This means probably that the parts of an epochal duration all occur simultaneously.

But how exactly does this new view bear upon our present discussion of temporal sequence? I said that a finite interval of time is necessary between any two observed stages in the growth of an object in order that one of them may be recognised to be not only different from the other, but *new* as compared with that other. And I said further that even to recognise change as such requires the recognition of an interval of time between the two stages, *viz.*, the stage before, and the stage after, the change. Now, however, according to the new view, time as *quanta continua* apart from the events that happen does not exist. If there be no such time, then there can be no finite interval between the two stages which according to our new terminology would be two events. Time is nothing apart from the events, and if between two observed events there are no other events, it follows there is no time between them. It may be that the object in question attained to the stage  $a_1$  at one moment or a finite slab of time, and then suddenly, by jerks, so to say,

<sup>3</sup> *Some Problems of Philosophy*, 172.

<sup>4</sup> *Science and the Modern World*, 179.

<sup>5</sup> *Ibid.*, 177-78.

<sup>6</sup> *Ibid.*, 179.

<sup>7</sup> *Ibid.*, 177.