

# Tractatus on time

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I often pick up *World and Life as One* to seek enlightenment about the *Tractatus*; especially Chapter 4 continues to give insight. There is however one issue that remains as baffling as ever: the young Wittgenstein's thoughts about time and timelessness. My contribution to the *Festschrift* is an invitation to a conversation rather than a fully worked-out analysis; but then, such an analysis would deprive me of the pleasure of exploring this topic together.

6.3611 We cannot compare a process with the passage of time there is no such thing but only with another process (such as the working of a chronometer). Hence we can describe the lapse of time only by relying on some other process. . . .

6.4311 Death is not an event in life: we do not live to experience death. If we take eternity to mean not infinite temporal duration but timelessness, then eternal life belongs to those who live in the present.

When I first read these lines, I understood them as referring to a mental struggle in which the darker features of the 'lapse of time' – decay and death – had to be overcome by a conscious effort to live in the present; but the struggle presupposed that the lapse of time and change are real, even if only in the relative sense of 6.3611. But thinking about possible interpretations of the 'temporal form' of objects (2.02510 makes me wonder whether timelessness is in effect built into the very ontology of the *Tractatus*. Below are some formal considerations illustrating the various options. The argument starts from

2.0251 Space, time, and colour (being coloured) are forms of objects.

provisionally interpreted as saying that every object has a temporal form. Let us try to formalise this idea.

If an object  $o$  has a temporal form, there must be a 'temporal aspect'  $t(o)$  which satisfies a logic of time. The temporal aspects are governed by relations such as 'precedence' ( $P$ ) and 'simultaneity' or the weaker (non-transitive) 'overlap' ( $O$ ). Let us fix as the logical form of time the following set of axioms, due to Walker [2]. The variables are to be instantiated by terms of the form  $t(o)$ .

1.  $P(x, y) \rightarrow \neg P(y, x)$  (anti-symmetry)
2.  $P(x, y) \wedge P(y, z) \rightarrow P(x, z)$  (transitivity)
3.  $O(x, x)$
4.  $O(x, y) \rightarrow O(y, x)$
5.  $P(x, y) \rightarrow \neg O(x, y)$
6.  $P(x, y) \wedge O(y, z) \wedge P(z, v) \rightarrow P(x, v)$

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7.  $P(x, y) \vee O(x, y) \vee P(y, x)$  (linearity)

These axioms (when considered in classical logic) allow a representation of time as a linear continuum in which the  $t(o)$  can be interpreted as intervals (Thomason [1, p. 89]). This temporal continuum forms one giant configuration in which each object  $o$  is related to any other object  $o'$  via their temporal forms  $t(o)$  and  $t(o')$  (even though these objects may be unrelated in other respects). According to

2.014 Objects contain the possibility of all situations.

2.0141 The possibility of its occurring in states of affairs is the form of an object.

any object  $o$  would have to contain all these relations in itself ‘from the beginning’. This seems to imply that every object  $o$  contains in itself the possibility of the coming into being and the ceasing to exist of any other object; but this means that  $o$  must exist ‘sempiternally’, and likewise for any other object. This in essence deletes all duration information about the temporal continuum so that ‘a thousand years in your sight are like a day that has just gone by’ (*Ps* 90:4), which is one way of viewing eternity as present. On the logical side, it raises the question, what *is* the temporal logical form of objects if the description in terms of the Walker axioms trivialises.

Moreover, although we have

2.061 States of affairs are independent of one another.

there can no longer be any independent states of affairs, because there exists only the single state of affairs given by the entire temporal continuum. This is very much like viewing the world *sub specie aeterni*:

6.45 To view the world *sub specie aeterni* is to view it as a whole a limited whole. Feeling the world as a limited whole it is this that is mystical.

A plurality of states of affairs is guaranteed only if the quantifiers in the Walker axioms range over the objects in a given state of affairs, which would give as many local (unrelated) times as there are states of affairs. By a similar argument as the one given above, the objects occurring in a state of affairs would have to be temporally co-extensive, even if perhaps not sempiternal, and the same considerations apply.

The argument proceeded under the assumption that objects have a temporal form that can be described by a logic involving the usual temporal relations. We may drop the assumption that objects have this temporal form, and are instead timeless; the substance (2.021) of the world is thus timeless, and what 6.4311 counsels is to see the world as it is. This however does not solve the riddle, how timeless (or for that matter sempiternal) objects can join to form configurations that do have temporal properties. The problem can be reformulated as follows. 2.0251 says that colour is a form of objects; but

2.023 In a manner of speaking, objects are colourless.

If something analogous holds for time, objects would be timeless, yet still have a temporal form. But what can temporal form be other than a way of existing in time?

## References

- [1] S. K. Thomason. On constructing instants from events. *Journal of Philosophical Logic*, 13:85–96, 1984.
- [2] A. G. Walker. Durées et instants. *Revue Scientifique*, 85:131–134, 1947.