PHILOSOPHY 4360/5360 – METAPHYSICS
Topic II: Identity and Persistence
The Relation of Diachronic Unity

The relation of diachronic unity is to be a relation between property instances such that if two property instances stand in that relation, they belong to one and the same persisting thing. The basic idea is to define the relation of diachronic unity in terms of the directed relation of **forward diachronic connectivity** – rather than in terms of the undirected relation of diachronic connectivity – together with a **non-branching condition**.

The reason for the expression "**forward** diachronic connectivity" is that the 'two deities' argument shows that diachronic connectivity requires causation. So "forward" here means "causally forward". Moreover, since it is not being assumed that backward causation is logically impossible, one should not take "forward" to entail "temporally forward".

The upshot is that we have:

Postulate 1: If property instance P stands in the relation of forward diachronic connectivity to property instance Q, then P causes Q.

Postulate 2: Causal loops are logically impossible – that is, it is logically impossible for it to be the case both that state of affairs A causes state of affairs B and that state of affairs B causes state of affairs A.

Consequence: Forward diachronic connectivity is an asymmetric relation: it is logically impossible for it to be the case both that P stands in the relation of forward diachronic connectivity to Q, and that Q stands in the relation of forward diachronic connectivity to P.

The Concept of a Forward Non-branching Chain Linking Property Instances

A set of property instances, S, is a **forward non-branching chain** linking P to Q = def.

(1) P and Q belong to S.

(2) P stands to Q in the relation of forward diachronic connectivity.

(3) For every property instance R that belongs to S that is not identical either with P or with Q, P stands in the relation of forward diachronic connectivity to R, and R stands in the relation of forward diachronic connectivity to Q.

(4) For every pair of property instances R_1 and R_2 that belong to S such that neither R_1 nor R_2 is identical either with P or with Q, either R_1 stands in the relation of forward diachronic connectivity to R_2, or R_2 stands in the relation of forward diachronic connectivity to R_1.

Next, there is the idea of a maximal forward non-branching chain, where this is a chain that is not a proper subset of any forward chain with the same first and last members:

The Concept of a Maximal Forward Non-branching Chain Linking Property Instances

A set of property instances, S, is a **maximal forward non-branching chain** linking P to Q = def.

(1) S is a forward non-branching chain linking P to Q.

(2) There is no set, T, such that T is a forward non-branching chain linking P to Q and S is a **proper subset** of T.

Next we need are the ideas of the first and last members of a forward chain. These ideas are needed both to define the ideas of forward and backward branching points, and because the requirements that must be imposed on the end points of a forward chain if those end points are to stand in the relation of diachronic unity are different than those upon any intermediate points. In the case of the latter, there must be neither forward branching nor backward branching, whereas in the case of the first point, backward branching is fine, but forward branching must be excluded, while in the case of the end point, forward branching is fine, but backward branching is not. So we need the following concepts:

The Concept of the First Member of a Causally Forward Non-branching Chain

Property instance P is **the first member of a causally forward non-branching chain** S = def.

For every R in S that is not identical with P, P stands in the relation of forward diachronic connectivity to R.

The Concept of the Last Member of a Causally Forward Non-branching Chain

Property instance P is **the last member of a causally forward non-branching chain** S = def.

For every R in S that is not identical with P, R stands in the relation of forward diachronic connectivity to P.

The Concept of a Causally Forward Branching Point

Property instance P is a **causally forward branching point** = def.

There are two maximal forward non-branching chains, S and T, such that P is the only property instance that belongs to both S and T, and P is the first member of both S and T.

The Concept of a Causally Backward Branching Point

Property instance P is a **causally backward branching point** = def.

There are two maximal forward non-branching chains, S and T, such that P is the only property instance that belongs to both S and T, and P is the last member of both S and T.

The Concept of Diachronic Unity

Property instance P stands to property instance Q in **the relation of diachronic unity** = def.

(1) There is a maximal forward non-branching chain, S, such that P is the first member of S, and Q is the last member of S.

(2) P is not a causally forward branching point.

(3) Q is not a causally backward branching point.

(4) For every property instance R that belongs to S, and that is not identical either with P or with Q, R is neither a causally forward branching point nor a causally backward branching point.

3. Concluding Observations

1. This account of diachronic unity is logically compatible with the existence of gappy objects.

2. It is also compatible with backward causation.

3. As a consequence of the second point, it is logically possible for property instances P and Q to stand in the relation of diachronic unity even if they are simultaneous.