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DISSECTIONS AND INTERSECTIONS IN A.N. WHITEHEAD

*Abstract*

In *Process and Reality* [5], A.N. Whitehead developed an interesting deep analysis of the geometric properties of the space-time, adopting a very original point of view: the concept of *region* and the relation of *extensive connection* among regions were taken as basic, while the classically primitive notion of point is derived from them via a process of abstraction. In a preceding paper [2], we presented a simple mathematical axiom system as a formal counterpart to the first 12 assumptions listed in Chapter II, Part IV of [5]. That was a first step towards the goal of translating Whitehead's informal analysis into a modern-style consistent mathematical theory.

This paper constitutes a second step of such program. Here we take into account two interesting notions in [5], to which Whitehead devoted his Assumptions 13 to 18, namely the notion of *dissection* of a region and that of *intersection* of two regions. We discuss these two concepts in the framework of the general theory of ordered sets and extend the axiom system of [2] to a larger one.

In the final section we prove the consistency of the system, constructing a “natural” model for it, which utilizes topological notions of the classical three-dimensional euclidean space.