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Individuals and Points

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The concept of a point has been of perpetual interest to philosophers and mathematicians alike. Contemporary mathematicians and philosophers have approached the subject in three ways: One is to take as basic individuals, volumes [10], regions [18], lumps [8], or spheres [14], and to define points in terms of sets of nested individuals by way of a relation, contained in the interior of [10], nontangential part of [18], completely contained in [8], or concentric with [14]. Another technique is to utilize algebraic operations, those of a Boolean ring [13] or a distributive lattice [15], on a set of individuals, and to define points in terms of certain subsets of this set that meet certain conditions. Presumably a set of any of the above basic individuals would do, except spheres, provided one allowed for disconnected volumes, regions, pieces or lumps. A third technique has been to take spheres [5], intervals [9], events [7], or any of the above basic individuals would do, and to define points as the atomic parts of these individuals; that is, as individuals which have only themselves, excluding the null element, as parts. Although different programs within these three groups have differed in detail, they are sufficiently similar to justify this three-way classification, which we shall call the nesting definitions, the algebraic definitions, and the atomic definitions.

In a recent paper [4], I presented an axiomatized calculus of individuals based on a primitive two-place predicate, 'x is connected with y'. which was the relation utilized by Whitehead [18] for his theory of Extensive Connection in which he proposed a nesting definition for points. Whitehead's theory of Extensive Connection was his last formulation of what was to have been the basis of the fourth volume of *Principia Mathematica*, a volume on geometry to be written by Whitehead himself.[1] In my paper, with slight alteration, I used Whitehead's mereological definitions to construct a calculus of individuals with pseudo-Boolean operators, pseudo-Boolean because of the absence of the null element as in the traditional formulations of the calculus of individuals. With the presence of the predicate, 'x is a nontangential part of y', I was also able

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