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The Individuation Problem: Realist Structuralism is Dead

Recent decades have seen the emergence of a new strand of philosophy of mathematics known as *structuralism*, Michael Resnik and Stewart Shapiro among its most vocal advocates. An important part of the overall project of structuralism is to provide an account of mathematical ontology that respects the idea familiar from Benacerraf (and others) that mathematical objects are to be individuated solely by the relations they have to each other. The basic *realist* elaboration of this idea is that mathematical objects, such as numbers, are *places in relational structures*. However, there is a vast class of mathematical structures that contain places that are *indiscernible* if intra-structural relations are all we have to go by. Given that the most straightforward structuralist account of place-individuation entails the "Leibniz principle" of the identity of indiscernibles, and given that there are no other such accounts the structuralist could adopt without compromising the very motivation of her position, she must treat structurally indiscernible places as *identical*. Thus, at least in the case of systems with structurally indiscernible elements, the idea of 'extracting' the structure of such a system and treating it as an entity on its own right is incoherent. The structuralist will then either have to show why this predicament does not vitiate her overall project or else, try to find other means of individuating places that respect the basic motivation of structuralism. We will argue that neither response can be sustained and conclude that opting for a nominalist account of the ontology of structures is probably the safest, albeit not entirely secure, route for the structuralist at the present time. In particular, realist structuralism is dead.