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Physical Pictures: Engineering Models circa 1914 and in Wittgenstein's Tractatus

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Abstract

In 1914, Wittgenstein recorded an incident in his Notebooks that he later mentioned to several friends as occasioning a major insight for his views in the Tractatus that propositions represent by being pictures. The entry reads: "In the proposition a world is as it were put together experimentally. (As when in the law-court in Paris a motor-car accident is represented by means of dolls, etc.*)" This incident, he said, was pivotal in coming to the view in the Tractatus that propositions represent by being pictures. In his later writings as well, investigations of what it is to understand a proposition remain tied to investigations of what it is to understand a picture. Numerous scholars have looked to Hertz' Principles of Mechanics as the element of Wittgenstein's milieu from which he drew the notions of model and picture used in the Tractatus; that they have done so may be due to a brief parenthetical remark in a much later section of the Tractatus. However, I think that a far more relevant source of a notion of model in Wittgenstein's milieu was the engineering scale model. The methodology of scale modelling is strikingly different from analytical methods, in just those ways that are important to the notion of picturing found in the Tractatus: the primary notion is that of translatability between two physical situations, rather than between a physical situation and a mathematical or linguistic representation, or, even, between two physically similar situations whose similarity is established by showing that they are both instantiations of the same more general equation or general description. The notion fits well with the remark: "The essential nature of the propositional sign becomes very clear when we think of it as made up of spatial objects (such as tables, chairs, books) instead of written signs (3.1.4.3.1)." It's also significant that the methodology of scale modelling can be used when one has no theory by which the behavior of the model can be predicted, or, even, a theory of the phenomenon being investigated. Since wind tunnels were already in use when Wittgenstein did his engineering studies, the concept of scale model would actually have been in his milieu much earlier than the pivotal 1914 notebook entry. However, the methodology of scale modelling was then more a matter of engineering practice than it was a formal methodology. At the time Wittgenstein recorded the insight about a world being "put together experimentally", the field was at a threshold. Formal foundations for the practice were just then being developed; it was in 1914 that Buckingham's proof about the minimum number of dimensionless groups needed to identify physically similar situations was presented in London. I also speculate on why the use of a scale model in the context of a courtroom, rather than a laboratory, lent significance to the incident.

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