**The World Is Not Given**

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Rasmus Winther convincingly links cartography and philosophy of science

In 1931, the Polish-American independent scholar Alfred Korzybski, who is now only known to connoisseurs of science-fiction history, coined the phrase "The map is not the territory." The philosopher of science, Rasmus Winther, who teaches at the University of California in Santa Cruz, uses mapping and cartography in his book to show the central role spatial relationships play in creating representations in the humanities and natural sciences. Scientific theories stand in the same relation to the world as maps do to the territory. This analogy allows us to understand scientific practices of representation – theories, models, and images – in all their diversity and, at the same time, to understand their frequently not openly expressed basic assumptions. In this context, the diversity of maps and cartographic methods represents a pluralist understanding of science and philosophy of science.

Every representation – whether a map, a scientific theory or a philosophical system – always depicts only a piece or extract of reality. The user of a map must not forget the political, social and scientific context in which these originated. The author illustrates this with the example of the Mercator projection, which for a long time was the dominant representation of the earth's surface in atlases. Such maps show areas near the poles greatly enlarged, which is why Europe appears dominant to Africa in terms of area. This was not the original intention of Gerardus Mercator (1512 - 1594), because he merely wanted to create a true-angle projection that would simplify the navigation on the world's oceans. But this projection was also used for geographical map work serving as symbolic support for European dominance over Africa and South America. The context of navigation Mercator originally had in mind was gradually forgotten.

Winther goes on to show the possible alternatives to the Mercator projection by means of the essential steps in the creation of a map: from surveying, data analysis, selection and classification of the properties to be displayed, through the choice of map scale, to the choice of map symbols. Winther contrasts these abstraction steps with their ontologization – when the territory is presented in accordance with the map. The driver of a car sees the territory represented by a map differently than a nature lover. And the action motivated by a representation can change the territory.

Winther moves agilely between considerations of cartography, on the one hand, and philosophy of science, on the other. This is especially significant in the chapter on the concept of contextual objectivity. Maps are not true or even only approximately true, but correspond to selected aspects of the represented objects in an appropriate way. The famous map of the London Underground network adequately represents the relative position of the stations to each other appropriately, while a street map represents local conditions fairly accurately.

Just like maps, scientific models and theories have a particular scope of application, and therefore these representations always correspond only to a part or excerpt of the world. The integration of different representations is necessary in order to recognize the limits of each individual mode of representation, and to avoid that a map, a model or a theory is equated with reality. Winther relies on a careful archaeology of the basic or foundational assumptions lying behind every representation, and on "counter-mappings": mappings that illustrate a minority or outsider point of view and thus show the contextuality of other maps. He illustrates his approach with examples of mapping in cosmology, brain research, and genetics. In doing so, he impressively shows the limitations the mapping of genes and brain functions have, and in which way "counter maps" can open up new perspectives.

Winther's book is an unorthodox and passionate plea for a diversity of perspectives - of structures, orders, and summaries - in cartography, science, and the philosophy of science. And at the same time, a convincing treatment of the tendency to confuse maps with the reality they describe.