Paradoxes of "Live-Cell Imaging"

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Abstract

Session "Frameworks and Representation of Cell and Genes II. Networks" (Reynolds, Stahl, Thieffry)
Cells are considered to be basic units of life and thus serve as an essential scientific object in the study of life. Becoming visible only with the help of microscopes, their discovery goes back to Robert Hooke, one of the first microscopists of the 17th century. Hooke not only found out that cork shows regular structures of similar "cells", but also assumed that these have a function regarding the nutrient transport. However, since the cells he dealt with were cork cells – meaning that they were actually dead – they clearly could not have had that function. Hence, already in this early scene of microscopy there emerges, though accidentally, a connection between the study of the living and the observation of dead material.

In the practice of today's microscopy we are still confronted with couplings of "life investigation" and death – but now, for the most part, this does not happen accidentally. On the one hand, the preparation of cells typically entails their fixation, meaning by implication the cells' death. On the other hand, the technical conditions that apparatus constructions impose on biological material frequently imply its death as well.
The analysis of microscopic practices as a method of studying life reveals several paradoxes leading to the hypothesis that biology is based on a constitutive difference between the examined phenomenon and the phenomenon to be examined. Eventually, this difference enables us to learn something about life in general, while, at the same time, it always contains a number of significant restrictions.

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