Tinkering in the Lab

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Abstract

Research tools dominate wetlab neurobiology; they're the first things one notices when one enters a lab. Yet the role and significance of research tools in wetlab neurobiology remains mostly unaddressed by philosophers of neuroscience. And this neglect is serious because it leads to a mistaken emphasis on the place of theory in mainstream neurobiology. Recent attention by a handful of philosophers on wetlab neurobiology's research tools challenges the "theory-centrism" that still remains prominent, not only among philosophers but also among cognitive and systems neuroscientists. Research tools that revolutionized neurobiology, in the eyes of neurobiologists, developed by way of what I'll call atheoretical tinkering in the laboratory—by solving engineering and technological problems, by trial-and-error, and even by sheer serendipity—and not by the systematic application of theory. Theory progress turns out to be tertiary in order of development and epistemic priority: laboratory tinkering → new experiment tools → theory progress. I'll argue for this pattern in this talk by examining some history of the development of two of 20th century neurobiology's most influential experiment tools: the metal microelectrode and the path clamp. I'll end by discussing some philosophically significant consequences of "putting theory in its place."