

Coordination of biophysical and biochemical research, 1920s and 1930s

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In the interwar years, publication platforms, chairs and laboratories were established for researchers who “aim at explaining life from the physico-chemical constitution of living matter”. The calls for the import of physical and chemical methods and concepts into biology were generally accompanied by calls for cross-disciplinary cooperation. To achieve their goals, it was argued, biologists and researchers from the physical sciences must join forces.

Historians explained this development in terms of biologists’ revolt from morphology and physicists’ and chemists’ attempt to acquire intramural funding. They have paid little attention, however, to epistemic reasons for cross-disciplinary cooperation. Nor did they clarify how biological phenomena were explained by reference to physico-chemical processes. The new mechanical philosophy provides such an account: It characterizes mechanistic explanations and describes strategies that “guide” mechanism research. Moreover, philosophers have argued that mechanism research promotes integration: different methods are required to establish a mechanism’s evidential constraints. Thus, the expertise of different disciplines must be combined. Yet the debate suffers from a lack of insight into material and social preconditions of actual mechanism research and theory integration. Consequently, we do not know how researchers assess(ed) whether a biological phenomenon could actually be studied by means of physico-chemical methods – and why chemists and physicists were interested in doing so.

The poster addresses these questions by presenting the results of an &HPS-analysis of crossdisciplinary research carried out in the 1920s and 1930s: on the biochemistry and biophysics of vision by Selig Hecht and his collaborators; on the biochemical basis of the genetics of flower pigmentation by Rose Scott-Moncrieff, the Robinsons, and J.B.S. Haldane; and on plant growth by Friedrich Went and Fritz Kögl, and Herman Dolk and Kenneth Thimann.

My account for these scientists’ research practice (i.e. their processing of a biological problem with particular physico-chemical methods) relies on historical and philosophical analyses. I take their research actions to be geared towards solving their research problems and assume that to explain them, I need to know practitioners’ goals, capacities (i.e. skills, resources), and the norms associated with acceptable solutions. In analysing how scientists planned their joint research, integrating History and (naturalized) Philosophy is crucial: The better one attends the local material, social, and institutional conditions of past research practice, the better one can identify the more global methodological norms. And the more we know about these norms, the better we understand the actions scientists performed to solve their problems.

The poster improves our understanding of how biochemical and -physical research was initiated, coordinated, and evaluated in the interwar years. Beyond this, it presents a hypothesis on the long-term development of research problems. Comparing the interwar studies with those of earlier researchers which pursued similar goals (e.g. Helmholtz, Wheldale, or Sachs) suggests that while goals and norms have changed little since the 1880s, new exact instruments facilitated the fulfilment of these norms: They allowed to identify some of the entities involved in the production of biological phenomena and to determine their physico-chemical properties.