Petruccioli, Sandro

Complementarity before uncertainty. (English) Zbl 1244.01012

In his article Petruccioli gives a detailed argument that a part of Bohr’s manuscript mss26 dated to the summer 1927 by the editors of Bohr’s “Collected Works” was written earlier. Petruccioli bases his statement on an analysis of the manuscript’s context and on some formal remarks. He starts his presentation with a detailed description of the context of the manuscript, that means the topics, the exciting developments in quantum mechanics as well as the lively discussions that are connected with the manuscript and the endeavours to get a consistent physical interpretation resolving the contradictions of the continuity/discontinuity as well as wave/particle dualism. Therefore he inspects the quarrel of the physicists about the foundation of quantum mechanics by matrix mechanics and the wave theory, two formally equivalent theories but conveying two quite different pictures of reality. He then shows in detail that the experiments of C. Davisson and L. H. Germer and their interpretation as an experimental confirmation of de Broglie’s wave hypothesis was known to the Göttingen physicists in Summer 1925. One year later, leading physicists among them Bohr, Born and Franck discussed the experiments with Davisson at the annual meeting of the British Association for the Advancement of Science. For these reasons Petruccioli regards the basis for dating Bohr’s manuscript mentioned above as demolished and re-dated one of the manuscripts one year earlier, between the Bohr-Kramers-Slater-theory (1924) and the 1927 drafts of complementarity. As a consequence he concludes that the re-dating changes “the interpretative perspective making it possible to achieve the historically correct reconstruction”. The assumption that complementarity was Bohr’s response to Heisenberg is therefore an error. Re-dating the document, “everything falls neatly into place”.

Reviewer: Karl-Heinz Schlote (Altenburg)

MSC:
01A60 History of mathematics in the 20th century
81-03 History of quantum theory

Keywords:
N. Bohr; W. Heisenberg; uncertainty principle; complementarity; quantum mechanics

Full Text: DOI

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Edited by FIZ Karlsruhe, the European Mathematical Society and the Heidelberg Academy of Sciences and Humanities
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