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Lise Meitner und ihr Kreis



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The focus of my research project this year has been to examine the intellectual networks that emerged in the international scientific community between the two world wars in connection with the genesis of nuclear physics and chemistry as a distinctive domain of scientific investigation. The specific theme around which the study is structured is a close examination of the reciprocity that developed between the experimental and theoretical approaches to the study of the nucleus.'

The central figure around whom the research is structured is the theoretical physicist Lise Meitner (1878-1968) who spent most of her long life in active participation at the advancing frontier of experimental nuclear physics. In this case the historian of science is supplied with a rich *Nachlass* that covers half a century of scientific collaboration and correspondence with an international constellation of prominent experimental and theoretical physicists. The study of the scientific careers of Meitner and her colleagues notably has served to reveal insights into the genesis of a new scientific discipline that normally are concealed from the reader in the published documents. Most important, perhaps, is the way in which the correspondence, notebooks, newspaper accounts, and unpublished documents for Meitner and her circle — that reach far beyond physics and physicists — serve to illuminate the social, political, and ideological contexts in which nuclear physics was brought to life and cultivated during the Weimar Republic and the Third Reich¹.

With Berlin as the essential point of convergence for the pursuit of nuclear physics in the 1930's comes recognition of the pertinence of relating and comparing the Berlin activities, attitudes, and styles of research with

the pursuit of nuclear physics elsewhere at the same time: Rome (Enrico Fermi's group), Paris (Irène and Frédéric Joliot Curie, L'Institut du Radium), Cambridge (Rutherford and colleagues, Cavendish Laboratory), Vienna (Stefan Meyer's group, Institut für Radiumforschung), Copenhagen (Niels Bohr's group, Institute of Theoretical Physics), and a number of laboratories in the United States and Canada. During the course of research it became evident as well that mainstream nuclear physics was being enhanced by pre-World War II investigations in a number of other countries among which the Soviet Union, Yugoslavia, Japan, and China seem to have been the most advanced.

A significant trend that this study brought to light was the realization that unlike the historical models that have been constructed to establish the dominance of theory over experiment in the development of quantum mechanics and relativity theory, in the genesis of nuclear physics, experiment invariably was ahead of theory. At most, the adjacent theoretical endeavours provided little more than rhetorical stance or epistemological claim. The study revealed that events and discoveries in the nuclear field were related predominantly to questions of experimental strategy, instrumental feasibility, and the competitive styles and modes of research practiced in various national laboratories.

The primary documents that were most pertinent for this study are located in various British and American archives and repositories, and mainly as the *Nachlässe* of and oral interviews with European emigrés. The most important of these are the Lise Meitner papers at Churchill College, Cambridge, England, and the resources at the Center for History of Physics of the American Institute of Physics in New York City. On the Continent significant documentary sources are located notably in Berlin, Vienna, Munich, Geneva, Graz, Paris, and Copenhagen.;

It remains for me to mention explicitly what it was at the Wissenschaftskolleg that provided the main support, criticism, and stimulus for my research. Most important was the opportunity to meet informally and daily with a group of scholars whose diverse interests and intellectual passions — in addition to their writings — got mixed up with and were taken seriously into account in the way that the "Meitner" project came to be implemented and restructured by the end of the year. Much of the writing remains to be done. The shifts in perspective on what to do and how to do it changed substantially during the year; and the end product will display prominently the stamp of the WK.4

Notes

- 1 Erwin Hiebert, "The Role of Experiment and Theory in the Development of Nuclear Physics in the Early 1930's", pp. 55-76 in *Theory and Experiment*, ed. D. Baten and J. P. van Bendegem, Dordrecht, 1988.
- 2 Erwin Hiebert, „Lise Meitner und ihr Kreis“. Vortragsreihe „Wissenschaften in Berlin“; Kongresshalle Berlin, 1. November 1987 (in press).
- 3 Research opportunities beyond what was available in Berlin (mainly the Archiv zur Geschichte der Max-Planck-Gesellschaft, Handschriftenabteilung der Staatsbibliothek Preussischer Kulturbesitz, Fritz-Haber-Institut, and Institut für Antisemitismusforschung) were provided by short trips to other centers: Geneva (CERN library archive and Pauli Nachlass), Graz (Universitätsarchiv der Universität), Jerusalem (Einstein Archives), and the DDR (Staatsbibliothek Berlin), and discussions, during a three-week summer school with historians, philosophers, and sociologists of science from East Berlin, Leipzig, Erfurt, and Potsdam.
- 4 The opportunity to present some findings on various aspects of the history of nuclear physics project were provided by several presentations at the Wissenschaftskolleg, a lecture at a joint colloquium of the Technische Universität Berlin and the Wissenschaftskolleg (8/9 February 1988), and a lecture at the 13th International Wittgenstein Conference 14-21 August 1988, Salzburg/Kirchberg, Austria. A workshop on "Fifty Years of Nuclear Fission" has been organized by the Wissenschaftskolleg for 30/31 March 1989.