

RAJKUMARI WILLIAMSON (ed.): *The Making of Physicists*. Bristol: Adam Hilger, 1987. viii, 200 pp., figs, tables and appendices.

In the Thirties, Ludwik Fleck was one of the first to study the intricate process of the "making of scientists", of 'introduction' into a scientific discipline through the daily practice of lectures, seminars and laboratory work under the close inspection of supervisors and tutors over a period of many years until a new member of the scientific community is "produced". The education of scientists has since interested historians, sociologists and philosophers of science alike. E.g., Kuhn has emphasized the way in which 'paradigms' (be it exemplary solutions to well understood problems or other components of the 'disciplinary matrix') are passed on to the next generation, creating an enduring 'normal science' mainly through education of young newcomers in the field; and Polanyi has revealed that many components of this learning process are 'tacit knowledge' not explicitly mentioned in textbooks or papers but practically acquired through mimesis in the laboratory. For recent sociology of science, the techniques of student training in the scientific disciplines are a major focus of interest.

Seen from this background, the contributions collected in this anthology are a very useful and noteworthy attempt to provide the scholar with material about details of this educational process. It includes reports from former students at a considerable number of universities, including of course the major British universities like Cambridge, Manchester, Dublin and Edinburgh, but also Sheffield, Bristol, Liverpool, and even a few foreign universities, such as Berlin, Paris and Copenhagen; and it covers the considerably long period from the early 1920s to the late 1930s – so it invites comparative studies on the pros and cons of differ-

ent educational systems. The more so, since several of the authors had studied at more than one institution and included remarks about their differences.

It is not surprising that Cambridge appears most often in the reports collected here, since it definitely was the center of British physics in this period, being the seat of the world famous Cavendish Laboratory under Rutherford and of many important colleges, such as Trinity or St John's, where international celebrities like Eddington, Dirac and Jeffreys lived and taught. Of course, from the students reports we learn something new about these men: e.g., that Rutherford was not the best at undergraduate lectures, because he apparently considered them as "a somewhat boring duty" (p. 102), or why Kapitza might have selected the nickname 'crocodile' for him (p. 109). But in contrast to an earlier anthology¹ of personal reports of eye-witnesses of the highest esteem, here we learn more about this place from the student's perspective. So, although all contributors later became well-known, some even distinguished, scientists (as the quantum physicist Nevill Mott, the experimenters Walton and Wilson, or the astronomers Brück, McCrea and McVittie), their reports are about a time when they still were 'nobodies' — freshmen at the lowest rung of the academic ladder. In this way their contributions give us history from below rather than from above (*Geschichte von unten statt von oben*). We learn a lot about curriculae, about good and bad lecturers, about laboratory life (including some facsimiles of lab notebooks). The problems which mattered to the students were, e.g.: how to get the Platinum wire from the "somewhat thrifty" Cambridge laboratory steward Fred Lincoln (p. 107 f.) or how to establish good contacts with the highly skilled glassblower Felix Niedergesass, who was of eminent importance to all experimenters in the Cavendish (p. 107).

In some reports, esp. in the one by Lady Bertha Swirles Jeffreys (later married to Harold Jeffreys) who was a research student at Cambridge in the 1920s, the gradual 'intrusion' of women in the male dominated world of science is touched upon: "The societies that met in the evenings, the $\nabla^2 V$ and Kapitza Clubs, were not open to me as a woman. I ought to have pushed more, but it might have been counter-productive" (p. 38, see also p. 106).

Since some contributors (esp. Burcham, p. 166 ff. and Lovell, p. 153 f.) made some efforts to compare their own education with today's training in physics departments and reflected upon the relative merits and deficiencies of both systems, this book is interesting for departments of pedagogy of science as well. A name index and three useful appendices on the contributors, the referenced institutions and personalia make this volume also a handy supplementary source for studies in straightforward history of science.

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¹ J. Hendry (ed.): *Cambridge in the Thirties*. Bristol: Hilger, 1984.