REVIEWS

Women in the History of Quantum Physics: Beyond Knabenphysik, edited by Patrick Charbonneau, Michelle Frank, Margriet van der Heijden & Daniel Monaldi (Cambridge University Press), 2025. Pp. 470, 25 × 18 cm. Price £37·99 (hardbound; ISBN 978 1 009 53583 0).

This well-written and rigorously researched volume documents the career histories of 16 women who carried out critical experimental research for quantum physics during the 20th Century. It does more than describe their achievements (and occasional frustrations) in this budding discipline; science had already been grasping at the reality of quantum physics in counterposition to classical physics, and needed but high-quality experimental proof to verify theories that were being suggested. It was actually Williamina Fleming (an astronomer, no less) who set the ball rolling here by recognizing that the spectrum of singly ionized He in hot stars mimicks the pattern of a hydrogenic sequence, thereby contributing verification for Bohr's model of the atom. Others then built upon her result from numerous standpoints that particularly included laboratory experiments — a professional activity in which women definitely excelled.

These 16 women represent a fairly broad geographical spectrum, though with a greater emphasis on Spain, Portugal, and Latin America than was the case for the 40 female astronomers who emerged successful according to *The Sky is for Everyone*[1]. Despite the positive vignettes portrayed in astronomy by that publication, its review in *The Observatory*[2] concluded that concentrating on the minority who were either fortunate or favoured did a disservice to the discipline as a whole, since the majority of those initially aspiring to careers in astronomy research left the field for whatever reason, and that the 'leaky pipeline'[3] had not been closed. The same biasses have still seemed to prevail in quantum physics, regardless of ethnicity or background.

So what went wrong? Why the need for a book like this one? The sad evidence is that the disadvantages, discriminations, and negativity of gender-based instances influenced progress in this field every bit as much as they have done in astronomy. What is chronicled here should therefore be given a place in every library that features the history of science. Even though it specifically tries to avoid selecting only those who made it to the 'top', we see a common trend. Most of its subjects were high-fliers at school and university, but all too quickly discovered that, whether through the pettiness of local politics, the constraints of motherhood, or the common assumptions that the male partner in a two-body cooperation is the prime author, for them the career ladder had already become the career *cul de sac*, and for no other clear reason than their gender.

In quantum physics as in astronomy, beneficial changes may now be in sight but at a relatively glacial pace, and it will probably take many more books like this present one to paint the accurate picture as to where and why half of the incipient workforce and high-quality brain power silently disappears from sight. In some cases, the achievements of the women whose work proved so fundamental to the progress realized by quantum physics in the 20th Century are preserved in the name of the male partner alone, thus denying them due recognition even as researchers in their own right.

Will we never learn? — Elizabeth Griffin.

References

(1) V. Trimble & D. A. Weintraub (eds.), *The Sky is for Everyone: Women Astronomers in Their Own Words* (Princeton University Press), 2022.

(2) R. E. M. Griffin, *The Observatory*, **143**, 134, 2023.

(3) T. Rees (Rapporteur), *Science Policies in the European Union: Promoting Excellence through Mainstreaming Gender Equality* (European Commission), 2000.