

## RECOLLECTION

### Rosalind Franklin: 50 years on

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It is 50 years since my sister Rosalind died, aged 37 years. It was an appalling tragedy for her family and friends and, as many have written, a great loss to science. But I do not want to write about any of that. I want only to say something about the extraordinary way her reputation has grown since her death.

‘Her work on viruses was of lasting benefit to mankind’ is inscribed on her tombstone. True, of course, but remarkably to modern eyes there is no mention of DNA. Some have asked for the inscription to be changed, to be brought up to date; but in fact it marks a moment in history—April 1958—before DNA had become familiar letters, and before Rosalind’s name was known outside the scientific community. She was at that time leading a distinguished group working on virus structure; she had been, when such travel was far less common than now, to meetings in the USA and many parts of Europe, she had lectured at the Royal Institution, and she had published nearly 50 scientific papers. In the year she died her model of the tobacco mosaic virus was displayed at the international exhibition in Brussels, to be moved later to the new Laboratory of Molecular Biology in Cambridge. Desmond Bernal, in his obituary in *Nature*, wrote of her ‘extreme clarity and perception in everything she undertook’.<sup>1</sup> In her own field, she could hardly have been more distinguished.

So there are several strands to the story, separate but linked. One is the gradual understanding by the general public of the implications of the discovery, and the publicity of the Nobel Prizes for Francis Crick, James Watson and Maurice Wilkins in 1959, followed by the popularity of Watson’s *The double helix* nine years later.<sup>2</sup> Another is the growing recognition of the importance of Rosalind’s contribution—and that in itself has become a mixture of appreciation of her scientific work and the creation of two images: the suppressed woman scientist, and the struggling but triumphant feminist. There is some truth, but not a lot, in both images. Her time at King’s College, London—the famous DNA time—was certainly overshadowed by frustrations, but they were only partly the result of sexism. And now, by way of reaction and to fit with the current climate, she tends to be put on a totally unrealistic pedestal of female martyrdom.

Robert Olby, who wrote the story of the discovery of the structure of DNA in *The path to the double helix*<sup>3</sup> in 1974, said in his preface, ‘I cannot recall the word DNA ever being mentioned when I was a student at London University in the early fifties.’

It was Watson’s book itself, with its brutal portrait of Rosalind—possibly even libellous if she had still been alive—that brought immense public interest and unexpectedly first brought her out of obscurity. It was of course a successful and thoroughly readable book, still in print 40 years on, but with such lines as ‘clearly Rosy had to go or be put in her place’<sup>4</sup> it showed Rosalind as obstinate, difficult, wrong-headed, unattractive—anything to make a story. She

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could be obstinate—no one would deny that—but only if her sense of justice was roused. And much of the rest of the picture was simply wrong. So wrong, in fact, that her friend Anne Sayre decided that she would write a book in Rosalind's defence. Her book, *Rosalind Franklin and DNA*,<sup>5</sup> less successful and famous but also still in print, was written, as she said, to make the protest that Rosalind could no longer make herself. And Aaron Klug put the scientific part of the story straight with his articles in *Nature* in 1968 and 1974 and more fully in the *Journal of Molecular Biology* in 2004.<sup>6</sup>

But the myth of the neglected woman scientist was appealing and it grew—'the forgotten heroine of the race to unravel the mystery of human DNA', as an article in the *Observer* called her in 2002. (Coupled with that, incidentally, came the totally wrong claim that her father opposed higher education for women—it was in fact certainly hoped, and almost assumed, that I should follow her to Newnham.) After Newnham Rosalind did a distinguished wartime PhD on the structure of coal, followed by nearly four happy postwar years in a Paris laboratory before the two years on the structure of DNA at King's. Her much publicized difficulties there were partly the result of a personality clash that had little to do with the fact that she was a woman. The trouble started with the ambiguous terms of her appointment, although admittedly it was not helped by the exclusively male senior common room, or by what Brenda Maddox has called the 'barracks-room, beer-drinking camaraderie' of much of King's.<sup>7</sup> But although her contribution to the Watson–Crick model was marginalized, her paper (with Raymond Gosling) did appear together with theirs in *Nature* in April 1953, along with the paper by Wilkins, Stokes and Wilson.<sup>8</sup> 'Rosy, of course, did not directly give us her data', Watson wrote in *The double helix*. 'For that matter, no one at King's realized they were in our hands.'<sup>9</sup> It was shabby behaviour and she was, at that time, cheated of her share in the glory—and so was the whole team at King's. Wilkins had no more recognition then than Rosalind; his FRS and his Nobel Prize came after she had died. In the speeches at that Nobel ceremony, Crick and Watson notoriously and shamefully did not mention Rosalind, and Wilkins's tribute was slight, but who can say what might have happened if she had lived? She went on to lead a team at Birkbeck College for the last years of her life, and there has recently even been a suggestion (in the biographical memoir of Wilkins for the Royal Society) that if she had missed a share in the 1959 Nobel Prize she might well have shared Klug's Nobel Prize for chemistry in 1982.<sup>10</sup>

Many have now taken over Rosalind's defence, among them feminists who write in a way that would have appalled her. For she was a scientist whose achievement should simply be judged on its own terms, not as a conscious blow for the rights of women. By the time she went to Newnham, women had been studying at Cambridge for more than 60 years. The first two women Fellows of the Royal Society had been elected in 1945. A scientific career may still have been an option for only a privileged few girls in the 1930s, in academic schools and in limited university places, but such careers were not unknown and the trail had already been blazed.

All the same, partly because the work she was involved in turned out to be so fundamentally important, and partly because of the tragedy of her early death, Rosalind's fame has continued to grow. St Paul's (her school) has now honoured her by giving her name to their technology centre; Newnham (her college) now houses graduates in the Rosalind Franklin Building—but in 1958 neither St Paul's nor Newnham thought of giving her an obituary notice in their magazines. Buildings and laboratories now carry her name in Cambridge, London, Holland and Belgium, and a whole university has adopted it in Chicago. There have been prizes, fellowships, books, radio broadcasts, television programmes, plays, projects for films—I am constantly coming across more.

Posthumously, Rosalind's reputation has been used, in a way that would have amazed her and still baffles members of her family, in the very useful job of encouraging girls to study science. Watson's portrait of her as a belligerent bluestocking may have made worried parents see her career as a warning, but it also made Anne Sayre show how wrong the portrait was, starting the reaction that now sees her as triumphing against all the odds, and makes her something of a heroine. Parents now hope her example will inspire their scientific daughters. That may be an unintended consequence, but we, her family, are proud and delighted.

## NOTES

- 1 J. D. Bernal, 'Dr. Rosalind E. Franklin', *Nature* **182**, 154 (1958).
- 2 James Watson, *The double helix* (Weidenfeld & Nicolson, London, 1968).
- 3 Robert Olby, *The path to the double helix* (Macmillan, London, 1974).
- 4 James Watson, *The double helix* (Penguin, London, 1999), p. 26.
- 5 Anne Sayre, *Rosalind Franklin and DNA* (W. W. Norton & Co., New York, 1975).
- 6 A. Klug, 'Rosalind Franklin and the discovery of the structure of DNA', *Nature* **219**, 808–810 and 883–844 (1968); 'Rosalind Franklin and the double helix', *Nature* **248**, 787–788 (1974); 'The discovery of the DNA double helix', *J. Mol. Biol.* **335**, 3–26 (2004).
- 7 Brenda Maddox, *Rosalind Franklin* (HarperCollins, London, 2002), p. 128.
- 8 R. E. Franklin and R. G. Gosling, 'Molecular configuration in sodium thymonucleate', *Nature* **171**, 740–741 (1953); J. D. Watson and F. H. C. Crick, 'A structure for deoxyribose nucleic acid', *Nature* **171**, 737–738 (1953); M. F. H. Wilkins, A. R. Stokes and H. R. Wilson, 'Molecular structure of deoxypentose nucleic acids', *Nature* **171**, 739–740 (1953).
- 9 Watson, *op. cit.* (note 4), p. 142; Watson and Crick had, without Rosalind's knowledge, been shown the MRC report on the biophysics unit at King's.
- 10 Struther Arnott, T. W. B. Kibble and Tim Shallice, 'Maurice Hugh Frederick Wilkins', *Biogr. Mem. Fell. R. Soc.* **52**, 455–478 (2006), at p. 468.