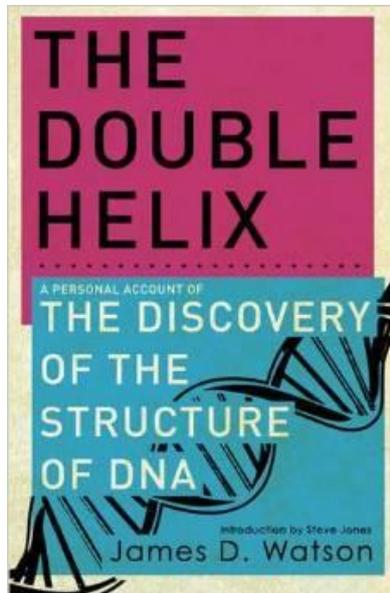


Book Review

The Double Helix – A personal account of the discovery of the structure of DNA, James D Watson, Phoenix, London, 2010.



Now something of a popular science classic *The Double Helix*, first published in 1968, still remains relevant to students studying Higher Biology and Higher Human Biology. It is well written and easily read making it accessible to senior school students. A personal account of the discovery of the structure of DNA it is as much a human interest story of the personalities and the social and professional norms of science and scientists of that time as it is an account of the biology of the structure of DNA. Thus it gives the reader an insight into both the science of DNA and the way that this science research was done. Obviously the science of DNA had moved on significantly since the time of Watson and Crick. The useful introduction to this edition by Steve Jones outlines the advances in our understanding of DNA that have taken place since that time. This is useful as the biology of DNA in Higher Biology and Higher Human Biology courses has also been updated to take account of developments in the understanding of DNA since the time of Watson and Crick.

Students should find no difficulty in following the science of *The Double Helix*. Watson documents the evidence of Griffiths and Avery and the phage experiments of Hershey and Chase (as well as his own work on phage) indicating that DNA is the heritable material, Chargaff's work on base pairs and the X-ray crystallography of Wilkins and Franklin as being the clues that led them to the double helix structure of DNA. This is also a common explanatory pathway used in biology textbooks when describing the structure of DNA and is a suggested case study approach in the Arrangements for Higher Biology and Higher Human Biology. Watson also describes his dawning realisation that DNA must be the template for RNA and that RNA must be the template for protein synthesis.

Students are likely to find the culture of the British science community in the 1950's somewhat strange! Dominated largely by public school educated middle class males, the predominating attitudes and values were very much of that time. The tension between collaboration and competition, intellectual snobbery and misogyny are all evident. The BBC 1987 *Horizon* film *Life Story* (it won a BAFTA best single drama award in 1988) with Jeff Goldblum as Watson and Tim Piggot-Smith as Crick captures both the drama of the times and the science well. Although not generally available it is well worth tracking down a copy. Watson's harsh treatment of Rosalind Franklin in the book, somewhat ameliorated in the epilogue was an issue with Watson's contemporaries at the time and has resulted in Franklin becoming something of a feminist icon. Many consider that had she lived, Franklin would have shared in the Nobel prize with Watson, Crick and Wilkins (Nobel prizes are not awarded posthumously – you have to live to see your work recognised). As a result her story has also been well documented, for example in Brenda Maddox's biography *Rosalind Franklin: The dark lady of DNA* [1]. Readers who want to delve deeper into the discovery of

the structure of DNA could refer to the papers *The double helix – the untold story* by J E Lydon [2] and Francis Crick's paper *The double helix: a personal view* [3]. There is also James Watson's 2005 TED talk *How we discovered DNA* [4].

All in all *The Double Helix* captures the tension and excitement of the scientific discovery of the structure of DNA. The competitive race for discovery of the structure against the American chemist Linus Pauling who discovered the alpha helix structure of proteins (the BBC Horizon film was titled *The Race for the Double Helix* in the USA). For students this story represents an interesting aspect of science. Most practical work that students undertake will be either illustrative experiments or experimental investigations. What Watson and Crick did was to collect and review experimental evidence to come up with a hypothesis for the structure of DNA which they then published in their famous paper in *Nature*. The elegance of that hypothesis was so powerful that it was widely recognised that it must be correct.

"The structure of DNA is too beautiful not to be true" – attributed to Rosalind Franklin by Watson

It then fell to others notably the X ray crystallographers from King's and Meselson and Stahl's experiments on DNA replication to test and confirm the hypothesis. All of this makes this story a useful scientific case study.

References:

1. Rosalind Franklin: The dark lady of DNA, Brenda Maddox, Perennial, London 2003.
2. Lydon J. E. (2003) The double helix – the untold story, *Liquid Crystals Today*, 2003, vol. 12, no. 2, 1–9 http://courses.umass.edu/physics890b-parsegia/pdf_files/lydon-DNA-story.pdf (accessed 2nd August 2014).
3. Crick F. (1974) The double helix: a personal view, *Nature*, vol. 248, 766-769. <http://profiles.nlm.nih.gov/ps/access/SCBCCR.pdf> (accessed 2nd August 2014)
4. <http://ed.ted.com/lessons/james-watson-on-how-he-discovered-dna> (accessed 2nd August 2014).