

## BOOK REVIEW

### Skimming the surface of the stuff of life

#### 50 Years of DNA

J Clayton and C Dennis (eds).

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Reviewed by SA MacNeill

*50 Years of DNA* is the Nature Publishing Group's celebration of the 50th anniversary of the discovery of the double-helical structure of DNA, an attempt to tell 'the extraordinary story of how the structure of life's most important molecule was discovered, and the impact that this has today'. At first glance, this is a handsome paperback, with a bright modern layout and an extensive range of illustrations, but what of the content?

The book comes in two parts. The first 80 or so pages comprise 10 chapters, written by former-scientist-turned-science-writer Julie Clayton, covering a range of topics from the history of genetic research through to the ethics of human cloning. These chapters are interspersed with transcripts of interviews conducted by Clayton with a number of key players in the story of DNA, together with a small set of contributed articles. The remaining 60 pages of the book will already be familiar to many prospective readers, as these first appeared as part of Nature's *The double helix – 50 years* special issue on 23rd January 2003. They are reprinted here exactly as they appeared then, albeit on higher quality paper.

Clayton's opening chapter, *On the shoulders of giants*, is a five page rush through over 2000 years of genetics research, from Hippocrates to Chargaff, with passing nods to Darwin, Mendel, Bateson and a host of others. This serves as an introduction to chapter 2, *The triumph of DNA*, which begins by introducing the key players present at the birth of the double helix: Watson and Crick, Perutz, Wilkins, Franklin and Pauling. Clayton then goes on to describe the events that led to the publication of the double-helix model, with Watson and Crick enthusiastically building cardboard models based, crucially, on the data of Wilkins and Franklin. That at least some of Franklin's data appears to have been shown to Watson and Crick without her knowledge (by Wilkins, and by Perutz, who had access to an MRC report written by her) is a familiar story to which nothing new is added here.

Chapter 3, *The golden years of molecular biology*, looks at the impact that the Watson and Crick structure has had on the development of the field from the 1950s to the present day, with contributions from Walter Gilbert, Kary Mullis and Craig Venter. In interviews with the author, Gilbert reflects on his early interactions with Watson (the two moved to Harvard at the same time in late 1956 and later collaborated on the discovery of mRNA) and on his invention of the method of DNA sequencing that bears his name, while Mullis credits his invention of PCR in 1985 to a 'really lucky break' inspired by 'innate

laziness'. Today his attention has turned to nanotechnology. At just 300 words, Venter's contribution is brief and somewhat bland.

Chapter 4, *Where are they now?*, is oddly titled, as only three of the six featured individuals (Perutz, Watson, Crick, Franklin, Wilkins and Pauling) are still alive. Both Watson and Wilkins are interviewed, the interview with Watson covering his relationships with Crick and with Franklin, his role in the Human Genome Project, and his long-term aim of curing cancer, all in his own inimitable style. Wilkins, meanwhile, is more circumspect, while Crick presumably declined to be interviewed.

The remaining six chapters cover a variety of topics but none in any great depth. Chapter 5 is devoted to *Crystal gazing*. The crystal structure figures are colourful but uninformative, the majority having been plucked from the pages of *Nature* without any attempt to integrate them into the text. Chapter 6, *Genomes galore*, discusses the human and mouse genome sequences at some length, dismissing the wealth of microbial genome sequences in two short sentences, while chapter 7, *Tracing human origins*, covers SNPs and microsatellites, the lost tribes of Israel, Iron Age skeletons and eugenics, all in six pages. Again, the illustrations are disappointing: what looks like a plastic skeleton in the sand and what may very well be one of the author's own holidays snaps. Titled *Zimbabwe*, the photograph is a landscape presumably taken in... but you've guessed already! *Gene detectives* (chapter 8) outlines disease gene mapping and its application to prenatal diagnosis, and discusses possible uses of preimplantation genetic diagnosis.

Chapter 9, *DNA in culture*, features short essays on DNA in popular fiction, in education and as an art form. The latter, written by Steve Nadis, focuses on *transgenic art*, with one proponent arguing that 'as transgenic art becomes more established, it will become less visible'. From the included descriptions of transgenic artworks, this sounds like a good thing. Finally, in chapter 10, *The genie is out*, Clayton discusses the ethical and moral issues surrounding human cloning and genetic enhancement (genome modification prior to IVF and implantation); Watson turns out to be firmly in favour of the latter.

The previously published articles in the second part of the book cover a wide range of topics with clarity and in depth. For the general reader, the historical perspectives appear to have most to offer: Maclyn McCarty, for example, looking back at 1944 and his discovery with Avery and MacLeod that DNA, not protein, was the material of inheritance. It is hard to disagree with Joshua Lederberg's assessment of this as 'the pivotal discovery of 20th-century biology'. Science historian Robert Olby's reflections on the rather muted response that the double-helical structure received when it was first proposed provide a fascinating insight into prevailing moods in the 1950s. Elsewhere, Brenda Maddox provides a synopsis of her well-regarded biography of Franklin (*The Dark Lady of DNA*, Harper Collins, 2002), while other articles examine the place of DNA in medicine and society. For the more advanced reader, the remaining reviews focus sharply on DNA replication and recombination, damage and repair, chromatin structure, etc, right

through to systems biology, arguably the first big new idea of 21st century biology.

The quality of writing throughout the latter part of the book section is excellent, as is the use of illustrations. Overall, however, it is hard not to be underwhelmed by *50 Years of DNA*. Its not at all clear at whom the book is aimed, with Clayton's chapters barely scratching the surface of the topics covered and with the second part of the book already available online, in University libraries, and on the shelves of *Nature* subscribers everywhere. Its hard too to imagine that many prospective purchasers in academia, staff and students alike, will be keen to pay for a book, almost half of which they can likely access for

free. As for the general public, will they buy a book, the latter half of which is clearly targeted at scientists? I suspect that unsold copies of *50 Years of DNA* may still be available when *100 Years of DNA* reaches the presses in 2053.

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