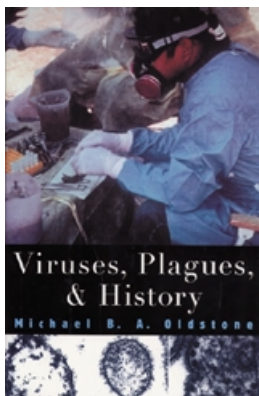


## On our tiniest foes

Antoine Danchin

**Viruses, Plagues and History**

by Michael B.A. Oldstone

Oxford University Press, Oxford, UK

211 pages, US\$ 25.00 Hardcover

ISBN 019 511 7239

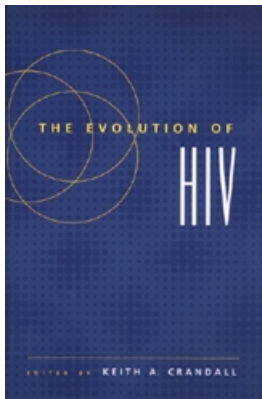
Looking at mankind's history, one cannot miss the fact that among all natural and man-made disasters, microbes and viruses have had the biggest impact on man's fate. This is the explicit theme of *Viruses, Plagues and History* and the implicit topic of *The Evolution of HIV*. However, one cannot imagine two more widely differing books on this topic: the first one is written in a journalistic style to appeal to the lay-reader, whilst the second book clearly addresses specialists in HIV virology. But they also have more in common than one would think at first sight because both books place the socio-economic aspect of diseases in the forefront. Certainly, viruses and civilisation have strongly influenced each other and continue to do so despite all efforts of modern medicine. Consequently, the contention of *Viruses, Plagues and History* is that human diseases shaped much of human history. And here is already its first drawback: Michael Oldstone considers only viral diseases, and, as such, the title of the book is misleading: plague and cholera, tubercu-

losis and parasites also shaped human history, and it is a particular bias to consider only viruses and the still not well-identified prion diseases. Moreover, the underlying philosophy of the book is influenced by a utilitarian view of science and history. Even viruses cannot escape this prevalent venal value: 'Individual viruses have evolved unique processes and "patented" them for success in this process.'

After a short introduction to the principles of virology and immunology, Oldstone describes success stories in the fight against viruses and ends by expressing concerns for the future. Lassa fever virus, Hantavirus and Ebola virus are members of different families which cause hemorrhagic fever, and the way they are spread are not well understood. HIV is clearly still not under control. We do not understand how prion diseases spread. And, finally, flu could make a very dangerous come back. In all cases the alteration of biotopes and life styles create new niches for dangerous pathogens. We are far from being able to control their spreading throughout the world. Unfortunately, the way principles of virology are set out by the author is very sketchy, to say the least, and not very insightful. Douglas Hofstadter, although he is not a biologist, provides a deeper view of viruses in *Gödel Escher, Bach* than Oldstone does, by describing them as organisms derived from cells that 'lack cell walls, are obligatory parasites, and depend for replication on the cells they infect'. In contrast, the view of immunology is full of details and jargon, which does not fit well with the obviously targeted lay-audience.

On the happy side, Oldstone gives us success stories: that of eradication of smallpox, control of poliomyelitis, vaccination against yellow fever (an hemorrhagic fever which was killing at a frightening pace, and was probably at the origin of the structure of the USA as we know it, since Louisiana was sold by France because of the heavy death toll caused by the disease), and vaccination against measles, which is no longer killing children as it used to do. Of the various

historical reports, some are interesting and give generally unknown—anecdotal—information, such as in the case of smallpox, measles or yellow fever. Some, unfortunately, fall short of what could be expected from a thorough historical account as is the case with Ebola or HIV. For the latter, the late Mirko Grmek's *History of AIDS: Emergence and Origin of a Modern Pandemic* provides a much better and more detailed history. Indeed, *Viruses, Plagues and History* assembles bits and pieces from books on the history of diseases, letters and conversations, of course, biased by the writers of these pieces of data. Everything suggests that this book has been written in haste, without much care for information: the bibliography is full of incomplete references, missing pages, and sometimes lacks even the name of the publisher or place of publication. One cannot help thinking that this is a superficial compilation. Is Oxford University Press so rich that they can afford to publish hardcover books that are not thoroughly edited? Let us retain a positive thought however. The author's aim, to expose the importance of diseases in history, is worth pursuing. In fact, this aspect of history, which has not yet reached its proper status in the teaching of history, certainly shows us a great deal about the evolution of man and microbes. This topic is not only a rich mine for a deep understanding of biology, but it is also a matter of real concern about the emergence of new diseases in the future. As the author reminds us, measles is a virus that crossed the species barrier when man domesticated dogs. In the same way, tuberculosis was originally a cattle disease. And this last example tells us again that such a book should not focus only on viruses but more generally on plagues, parasites and history.



---

---

## The Evolution of HIV

Edited by Keith A. Crandall

Johns Hopkins University Press, Baltimore, MD  
520 pages, US\$ 34.95 Paperback  
ISBN 080 186 1519

---

---

*The Evolution of HIV* is clearly written for specialists. It puts together the various facets of this important but yet elusive disease, and compiles reflections on the evolution of this virus as seen by molecular geneticists, statisticians and specialists in the evolution of populations. While this is not the usual view one has of HIV, it is certainly an interesting one—but, remember, highly technical. The book separates two well-defined topics, those dealing with actual data—known histories of transmission and general population genetics—and those constructing models to represent and analyse the complex data set. The aim is to understand the present spread of the epidemic and predict future developments. As the book depicts just one moment in the epidemic, it is likely that some of its content is already obsolete.

But as a model for viral evolution, this book is a gold mine. No virus has been studied more intensely than HIV, and this provides us with a wealth of data to explore many models, particularly in population genetics. Also, I am tempted to emphasise one prominent conclusion from reading *The Evolution of HIV*, namely that blood—any type of conduct that leads to bleeding or easy access to blood—is the major contaminating source. Other pathogens associated with HIV provide much help in the infectious process, most probably by removing barriers to the blood stream. This book, therefore, should be used as a starting point for those who want to browse the huge literature on the subject

and who hope to escape duplication of efforts made by others. It may be of use, also, to those who devise policies for the containment of the epidemic.

While the book's wealth of data makes it so valuable as a starting point for further investigation, it also might make books such as this obsolete in the future. Indeed, one wonders how scientists are able to explore the full content of books—this book is a case in point—without having recourse to computers. When will all science books become electronic? Paper-based books will remain of immense use during travel and leisure, but gathering information just by reading books will soon be impossible, I am afraid.

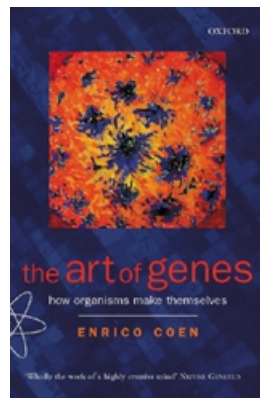
The author is at the HKU-Pasteur Research Centre, Hong Kong

E-mail: adanchin@hkucc.hku.hk

DOI: 10.1093/embo-reports/kve120

## Colours of development

Suresh I.S. Rattan



---

---

## The Art of Genes. How Organisms Make Themselves

by Enrico Coen

Oxford University Press, Oxford, UK  
386 pages, UK£ 20.00  
ISBN 019 850343 1

---

---

Reviewing Enrico Coen's book has proved to be a challenging task for me. Not because it is not good—on the contrary, it is a truly impressive book. The challenge for me has been to evaluate *The Art of*

*Genes* without considering similar ideas discussed in another remarkable book that I had recently reviewed: *The Triple Helix* by Richard Lewontin (*EMBO reports*, December 2000). But Coen's book is unique as it uses and transforms the process of creating a painting as a metaphor to explain developmental biology. By using painting as an example, the author, a Fellow of the Royal Society, and Professor of Genetics at the John Innes Centre in Norwich, UK, does not want to diminish the creative aspect of the other fine arts. Indeed, he admits that any human creative act comes closer to describing the process of development, rather than the prevalent notion of simply following a set of instructions.

Biological development of an organism is not merely a read-out and implementation of a set of genetic instructions. As in painting, development is a continuing interaction between the 'painter genotype' and the 'canvas phenotype' that finally produces a living organism. The generation of an individual entity through developmental processes is indeed a more creative act than the purely mechanical concept of molecular copying and reproducing could explain. It is due to the painting-like process of development that no two biological entities are exactly the same—not even monozygotic twins or clones. This does not, however, mean that there are no rules or boundaries for growth and development to proceed. Certainly, there is an intrinsic consistency and reproducibility in development, which ensures that the principle of 'like begets like' is maintained.

*The Art of Genes* is organised in eighteen metaphorically titled chapters, such as 'Painting a Picture', 'The Expanding Canvas', 'Scents and Sensitivities' or 'The Story of Colour'. Each chapter starts with the painting metaphor to describe different aspects of developmental biology. For instance, the second chapter 'Copying and Creating' introduces the basic mechanisms of DNA replication, transcription, translation and cell division. The following chapter, 'A Question of Interpretation', discusses formation of patterns during development by comparing the evolution of butterfly patterns and human designs. It also explains how such patterns can change through a series of modifications where each step depends on prior events. In this context, Coen argues that identifying an absolute starting point for development is not important,