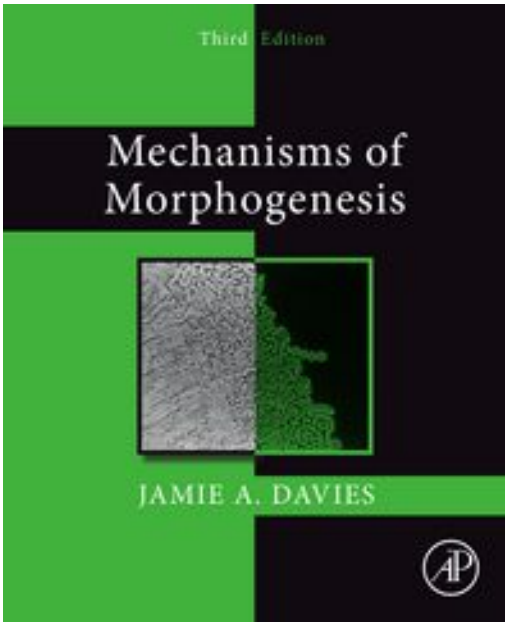
A time capsule.

When I was a teenager, there was a bit of a vogue, encouraged by the BBC children's programme Blue Peter, for people to bury 'time capsules' containing a snapshot of the world at a particular time. The idea was that they may be dug up much later, luck finders of the future being fasciated by the newspapers, audio recordings, school books etc. from the time of the burial. This still goes on, of course, though it has been partially replaced by geocaching, which is different in that people are encouraged to dig buried things up and leave something in their place, with little time elapsing, usually.

I have never buried a physical time-capsule, not have I found one. But I am currently experiencing something like finding one I had buried earlier. I know countless authors have been in this situation before, but it is seldom mentioned, probably because they have more important things to say. Monographs and textbooks in the sciences tend to go through periodic revisions, because the nature of scientific research is that what was once an up-to-date summary of thought in a field becomes outdated in only a few years. When publishers find they have a successful book on their hands, they tend to approach its author after 7-10 years, to ask for an update for the next edition. This year, I am revising my monograph *Mechanisms of Morphogenesis* for the second time. Its third edition will come out some time next year, in a familiar-looking cover with a new colour scheme (the first edition was red, the second blue: this one will be green).



Like many authors, I suspect, I maintain an 'update' file of new things that ought to go into a next edition, but updating is not simply a matter of adding material. It also involves condensing some material that was there before, particularly when a confusing mass of half-understood facts has been resolved into a clear story. And it can involve a lot of reordering and reemphasis and, at the end, of revising summary thoughts about 'what it all means'.

A first step in revision is to re-read the previous edition of the book, and that is where the time-capsule feeling comes in. Reading my old words back, especially in the more integrative sections

that try to draw general principles from the results of many experiments, is a strangely archeological experience. Though the metaphor of gaining scientific understanding is the suddenly illuminated light bulb, in my experience the reality is much more subtle, a series of small changes that alter understanding by imperceptible degrees, not sudden yells of 'Eureka'. Day to day, it is easy to miss that fact that your picture of how something works is changing at all. But the experience of reading a decade-old text written by an earlier version of oneself brings the cumulative effect of all of these changes into sudden focus. Did I really think that explanation was likely? Was I really so stupid as to miss the significance of those at-the-time obscure observations?

Reading one's old text has another effect, at least in my experience: it brings back incidental memories. Just as looking through a photograph album will trigger memories of many things not in the photograph, but connected to the place and time at which it was taken, reading text written log ago will bring back incidental memories. Some are uncomfortable: my writing the last parts of the manuscript of the first edition coincided with my late father's last days, spent in palliative care. The typing was done on train journeys south to visit him and then back to Edinburgh to deliver lectures to students, before heading south again. Some of the final checking was sitting at his bedside, he far beyond consciousness by that stage, and I wanting to be there with him, just in case of a revival of sentience I knew to be impossible, but needing also to have something to take my mind out of that room. Others are much happier. Particular illustrations reminded me of fascinating conversations with my wonderful colleagues about some of the material; a particular phrase from the second edition took me straight back to sitting on the deck of my boat, moored under a tree on a blazing hot day, where I first wrote them. And some parts triggered memories with no obvious connection to the book at all, but simply coincident in time: memories of dancing with a particular woman, or swimming in a chilly loch, or all kinds of other things linked only by the month and the year, not by anything really to do with the book itself.

One of the 'meta' skills we teach our medical students is reflective practice. This is generally to be applied over relatively short time-scales, reflecting on a day, or a week, or maybe a year of their study and how it has changed them (or how they should let it change them). It is a useful skill for scientists too, but we seldom get nudged to do it, except when a setback raises the question 'what can I learn from this, to do differently next time'. But the nudge for unplanned reflection given by reading ten year-old text makes me thing that it would be no bad thing to encourage longer-term reflection too. To reorder the phrases in a quotation by the philosopher Søren Kierkegaard, *Life*

must be lived forwards, but can only be understood backwards. And to quote Yvonne Woon,

Sometimes, you have to look back in order to understand the things that lie ahead

Jamie Davies, Edinburgh, October 2022