Boundaries of regulatory science : Eco/toxicologyy and aquatic hazards of chemicals
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Preamble

 Thou art my master, and my author thou,
 From thee alone I learned the singing strain,
 The noble style, that does me honour now.
 Inferno, I:85-87, meeting Virgil.¹

This, at long last, is my dissertation. Dissertations are very peculiar documents, linked to academic rites of passage, disciplinary mores, and evolving conceptions of research. Because ideas of what dissertations are – or should be – vary in time and place, they offer an interesting window on the cultural variety and change in science.² Please allow me the liberty of autobiography to illustrate my point, at risk of sounding self-infatuated.

I became a sociologist in an academic world where dissertations were exceptionally thick and learned volumes. First and foremost, they displayed one's knowledge and understanding of the disciplinary canon. A typical social science or humanities dissertation started with several chapters of extensive review of 'the literature', adding profound thoughts and reinterpretations to the margins of Tradition. The second major requirement was to add some piece of novel knowledge to that Tradition. This is how the author of the doctorate showed that he or she was a worthy aspirant for the academic community: worthy to convey the Tradition to students and capable of expanding it with new knowledge and insight. This was Belgium and these were the eighties, and, as a student, I was never truly a member of that particular academic community. My idea of dissertations may therefore have been the slightly off-centred stereotype of the uninitiated fringe. Nevertheless, that was the task I thought lay in front of me when the Department of Science Dynamics in Amsterdam offered me the opportunity to write a dissertation. It seemed self-evident that I was going to write one of these monstrosities and my first priority was equally obvious: read everything and write an extensive

¹ Inferno quotes are from the 1949 Dorothy Leigh Sayers translation, Dante Alighieri, The Divine Comedy.
² How could I write a dissertation in Science and Technology Studies and let the occasion slip to be reflexive about dissertations? I might as well add something about footnotes, while I am at it: references in the footnotes include the author and brief title only. I believe this makes it easiest for the insider to recognise a reference easily, without having to flip through pages or know which publication is meant by something like "(Halffman, 2003)". For other purposes, full references can be found at the back. And as I am about to thank people for everything I have stolen from them: I snatched the system from Steve Shapin.
review of it, displaying as much knowledge and insight as I could muster, to prove that I was worthy.

How different things were in The Netherlands! Now I kick myself for not having registered the consequences for my own work of a different academic culture. As a sociologist and, a fortiori, as a sociologist of science, I should have noticed more quickly the different value and meaning of the Dutch dissertation. Here, ‘promovendi’ wrote books. Books. As a book, many of the dissertations had the ambition of being an entertaining and good read. Many scholars preferred to write their dissertations in Dutch, as this was seen as the only way to write beautifully when lacking native English skills. I had always thought that the first requirement of a decent dissertation was to be turgid. An extensive review of an academic tradition, elaborated with comments and profound insight, does not make a good read. Through Dutch eyes, I was producing esoteric scholastics, not a dissertation.

It seemed to me that Dutch social scientists wrote dissertations to corroborate an already established position at the university, often in the comfort of tenure, rather than obtain access to such a position. Apart from a confirmation, dissertations seemed to function as contributions to broader Dutch culture rather than just to specialised scholarship. These were not grey, mimeographed, glued bundles of A4 paper, reproduced to a dozen copies or so, destined to lead a life in the darkest corridors of university library stacks. These were elegantly bound, colourful books with an expensively designed cover, defended in a public setting were journalists or policy makers were valued guests.

One of the highest honours for a Dutch dissertation in the social sciences was to be reviewed in the national newspapers, to be bestowed with ‘visibility’ and attention among the local intelligentsia, academic and non-academic. As in Belgium, a social science dissertation showed that one was a competent researcher, but for much of Dutch social sciences this seemed to include the task of participation in a public intellectual context. This was especially the case if one wrote a dissertation in Dutch Science and Technology Studies (STS), which was then still a field with a mission. The primary task of a dissertation was therefore to write revealing stories that held a mirror up to society, to help it reinterpret and perhaps improve itself. Particular for some of my colleagues was the goal of talking back to the scientists they had studied, the biologists or medical researchers that figured in their dissertations. Even then, dealing with the Tradition was a matter best kept behind the scenes, particularly in an interdisciplinary field such as STS, where, at the time, traditions were fractioned and reassembled faster than anyone could produce a dissertation.

By the time I had swallowed my misdirected ambitions, the standards had shifted again. My generation of ‘promovendi’ struggled with a new status, the status of ‘assistant-in-training’ (AIO). We had jobs at the university,
were clearly in the waiting room. Under the pressure of budget cuts and academic managerialism, a dissertation was no longer to be conceived of as a book. Although we mirrored our standards to the exemplars of our predecessors, we were told that we should adhere to entirely different standards. Dissertations were still the certificate of a competent researcher, but this now meant the performance of a manageable, well-defined empirical research project. Finishing such a project in the allotted time frame was construed as an important indicator of competence, foreshadowing the conditions of the academic subsistence of contract research that lay ahead of us.

Culture is a tenacious thing. Initially, subversion of the new managerialism in favour of the old values was celebrated. People continued to write dissertations in the old style, clinging on to the margins of an academic system that no longer wished to provide for them. We refused to swallow our ambitions, even if misdirected, and were often discretely patted on the back by our older role-models for our silent protest. Increasingly, we started to write in English, attempting to address what we hoped would one day be our peers in the international academic community, following the academisation of Dutch STS.

It was a transition. The managerialism won and ‘promovendi’ turned into something more like the doctoral students of the Anglo-Saxon world. The university tried to replace appointments with scholarships for writing dissertations. ‘Promovendi’ moved from the waiting room of the academic world back to the final grade of university training. Increasingly, one could only write a dissertation if the project was designed beforehand, usually by a senior researcher. The test of the competent researcher came to prioritise productivity, speed, elegance, and publishability.

As with much of science policy, the model of the natural sciences became the implicit standard for all researchers. The official standards of productivity prefer publications in international journals, which are standards that can be measured and quantified and used for legitimatory purposes in the endless budget cuts. These criteria played down the wider cultural role that was considered so important among much of Dutch social science. A competent researcher became he or she who provided proof of being able to live up to these new standards; hence the introduction of dissertations consisting of bundled articles, preferably already published, in fields where we had not seen them before. It worked. The productivity of dissertations at the University of Amsterdam is now so high, that to my astonishment the waiting list for a date on the graduation roster is about half a year.

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3 But not all of it, see Van El, *Figuraties en Verklaringen* for differences in style in schools of Dutch sociology.
This little story of the changing nature of dissertations is illustrative of the kinds of processes in science that I try to describe in this thesis. Many of these themes will return on the voyage through the world of ecologists and environmental toxicologists on which I hope you will accompany me. Contrary to the universalist ideology of science, research is not quite the same everywhere. There are differences between academic cultures in different countries, as the ones between Belgium and the Netherlands that I encountered. There are differences between research fields and even between schools in those fields. And there are differences in time, as academic culture changes in response to political, cultural, and economic changes.

Writing a dissertation in the midst of these changes was aiming for a moving target. By the time I had adjusted my plans, the requirements would be different again. I decided that the only way to finish would be to set a target of my own and stick to it. So what did I aim for? What is this lump of paper you are holding? As far as I am concerned, it is my attempt to show that I am worthy of membership as an academic in the field of Science and Technology Studies. The journalists and the ecologists and the environmental toxicologists and the policy makers will have to look elsewhere. With this document, I do not aspire for membership in any of their forums. This one is for those I hope to be able to call my peers.

I would like to thank everybody who has helped me to write this dissertation. Before anyone else, I should mention the Department of Science Dynamics, not just because (to my enormous astonishment) it hired me as a total outsider and supported me through the years, but most of all for having been such an incredibly stimulating and exciting intellectual environment – in spite of its flaws, which had nothing to do with its academic quality. Its demise has been very painful. Especially for wandering junior researchers who were looking for intellectual soul mates, the department provided a haven and the necessary litres of coffee to keep debate and work afloat until late at night. I want thank Stuart Blume for his steadfast insistence on allowing promovendi to find their own way, Rob Hagendijk for keeping an eye on me and pushing me further than I thought I could go. But I am really indebted to everybody at Science Dynamics: for comments and feedback, for reading drafts and allowing me to read theirs, or for just talking. To the people I shared a room with, like Frank Wamelink, Patricia Faasse, Michiel van Well, Michiel Schwartz, Carolien van Leenders; or people down the hall, who would always be willing to help find an article or discuss some subtlety, whether staff like Olga Amsterdamska, Anja Hiddinga, Jack Spaapen, Nelly Oudshoorn, Chunglin Kwa, Frans van Steijn, or Loet Leydesdorff, or juniors like Caat Schulte, Ad Prins, Richard Rogers, Martin Pastoors, Hans Postel, Andres Zelman, Anne Beaulieu, Paul Wouters, Jessika van Kammen, Koen Frenken, Leen Dresen, Amâde M’charek, Arnold Wilts, Gertrud Blauwhof, Bernike Pasveer; and particularly
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I also want to thank the Dutch Graduate School of Science, Technology and Modern Culture (WTMC) for providing an excellent forum for debate and for fostering friendships, intellectual and beyond. The workshops and summer schools of Loowtok, as it was then called, will always remain a fond memory, especially because of the enthusiastic organisation by Hans Harbers. Of the many people I met at Loowtok, two remain very dear to this day, Roland Bal and Maarten Derksen, both of whom have helped a lot with writing. Roland had the remarkable ability to always remind me what my dissertation was actually about, especially when I was convinced I had lost track definitively, and Maarten managed to plant just the right nagging questions in my head to steer me away from the obvious open road. I am sure I stole ideas from many others at Loowtok, guests and participants alike. The haze of smoky bar nights at Logica would never allow me to reconstruct all the precise credits. Thank you all.

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