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Protection des cultures, construction de la nature : agriculture, foresterie et entomologie au Canada, 1884-1959. By Stéphane Castonguay. (Québec : Septentrion, 2004. 370 p., ill., fig., bibl., index. ISBN 2-89448-377-5 \$39.95)

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For those of us who have long insisted on the importance of agriculture to any critical understanding of the relationship between knowledge and power, Stéphane Castonguay's *Protection des cultures, construction de la nature* is a welcome and provocative contribution to such a critical understanding.

Castonguay focuses more specifically on the historical development of inquiries into the life of insects within expanding governmental organisations dedicated to the promotion of Canadian agriculture. He starts in 1884 with the appointment of the first Dominion Entomologist and, despite the date identified in the title, he closes his narrative in 1963, with the publication of the report by the Royal Commission on Government Organization (the so-called Glassco Report). Significantly, during the 1960s, institutional reforms of publicly funded scientific research, not just in Canada, but also in the United States and United Kingdom, made much of the need to secure a clear relationship between "basic" and "applied" research, often conveying the impression that, precisely because this relationship was confused, research in governmental institutions concerned with the agricultural industries was of inferior quality and outdated. In Canada, however, the case was quite the opposite. Studies of the life of insects in the fruit orchards of Nova Scotia and British Columbia, the wheat fields of Manitoba, and the forests of Ontario, which had been undertaken by the Science Service of the Ministry of Agriculture, had resulted in profound and widely respected understanding of both the ecology of populations and the most fundamental physiological processes. The problem with the Science Service, at least according to the Royal Commission on Government Organization, was instead that its activities were at odds with the needs of the agricultural industries it was supposed to support, and thus in need of fundamental reorganisation. Universities, the supposed standard-bearers of the best scientific research, were the main beneficiaries of such reorganisation.

Castonguay's basic argument is that the distinction between "basic" and "applied" research, and its implicit assumptions about the relationship between the pursuit of knowledge and the advancement of economic goals, should not be regarded as a categorical and essential one, but as the outcome of complex historical negotiations. While the political merits of Castonguay's thesis are unclear, especially as he seems

to look back on the Science Service with a certain wistfulness, he articulates very compellingly the processes whereby the investigations of the Dominion Entomologist and staff in the Department of Experimental Farms, often reliant on the aid amateur naturalists and immediately related to the needs of agricultural interest groups such as the British Columbia Fruit Growers' Association and the Nova Scotia Fruit Growers' Association, increasingly gave way to the work of large numbers of professionally trained insect ecologists and physiologists, whose links to organisations such as the Canadian Pulp and Paper Association, sponsors of the renowned Green River Project, were far more removed. Increasing distance, however, does not mean increasing irrelevance to any economic goals, as the Royal Commission on Government Organization seemed to suggest, but points instead to a process of negotiation between the competing demands of increasing numbers of intermediary institutional actors. Castonguay's narrative is so compelling because he traces in minute detail the negotiations between a bewildering number of different institutional actors and painstakingly correlates the outcome of these negotiations with the changing content of scientific research and methods of investigation in a perhaps smaller number of centres dedicated to understanding the life of those insects feeding on the products of the Canadian agricultural industry. He also puts to good use a growing literature on the history of the agricultural sciences in Canada, the United States and United Kingdom, both as model and to chart important historical connections. The same can be said of a more established literature on the "fundamentalisation" of the engineering sciences.

Refreshingly, Castonguay does not write in the long shadow of Rachel Carson's *Silent Spring* (New York, 1962), which shaped much of the early historiography of modern investigations of the lives of insects. Incidentally, such circumlocution is necessary, firstly because, by the beginning of the twentieth century, "entomology" was already synonymous with "economic entomology," and secondly because the work of the Science Service, between its birth in 1938 and its demise in 1959, effectively pioneered the abolition of the organismic sciences and their replacement with the modern life sciences, so that the more concise phrase "modern entomology" begs more questions than it answers. The more important point is that, writing outside the shadow of *Silent Spring*, Castonguay can approach the history of "biological control," the use of native and imported natural enemies to control noxious insect species, and "chemical control," the use of toxic chemicals to control the same insect species, symmetrically. We can then better appreciate the modernity and excitement of research into the physiological effects of the

synthetic insecticides first introduced during, and just after, the Second World War. It is perhaps unsurprising that, in places, Castonguay draws quite heavily on Edmund Russell's widely acclaimed *War on Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring* (Cambridge, 2001). Oddly, such symmetry also casts an altogether different light on the history of ecology, now a central actor in the same abolition of the organismic sciences and replacement with the modern life sciences.



Insecticides Field Trials, Central Experimental Farm, Ottawa, 1914 (LAC, C002213524)

Source : Stéphane Castonguay, *Protection des cultures*, from the cover.

Strikingly, however, Castonguay rejects not just the structuralism that informs the categorical opposition “basic” and “applied” research, but also any reductive institutional explanations of the transformation of research on insect life within the Ministry of Agriculture, tacitly raising a troubling and unresolved methodological issue. Castonguay again argues quite compellingly that the above transformation followed different courses depending on whether the industry in question was horticulture, agriculture or forestry. He clearly identifies how the different economic structure and history of these three industries shaped technological choices and modes of interaction with researchers in the Ministry of

Agriculture quite distinctively. Thus, while the horticultural industry preferred to support research on “chemical control,” “biological control” was more appealing to cereal producers on the western plains. The forestry industry is more interesting insofar as it developed later, and it initially viewed fires rather than insects as its greatest problem, at least until researchers in the Ministry of Agriculture persuaded it to think otherwise. While it is a pity that Castonguay does not attend more closely to this situation and its implications for our understanding of economy and economic constraints, the above economic considerations are not simply a matter of producing a finer grained analysis. The aim is instead to emphasise the contingencies that shaped the shift from the investigations of the Dominion Entomologist and staff in the Department of Experimental Farms, all closely related to the needs of agricultural interest groups, to the work of large numbers of professionally trained insect ecologists and physiologists in the Science Service, work whose links to industrial organisations were far more removed than they had been seventy years earlier. None of this is exceptionable, apart from the inclusion of insects’ lives as a disruptive agent. As Castonguay puts it:

[L]es environnements agro-forestiers et leur faunes entomologiques ont continué d’exercer différentes *contraintes* sur les activités des entomologistes ; les infestations ont cessé de nécessiter la mobilisation des chercheurs sur le terrain, mais elles ont influencé l’allocation des ressources; et, dans certains cas, la programmation scientifique du service entomologique (p. 317; emphasis added).

Not only does this statement sit incongruously next to Castonguay’s tantalising remarks about the transformations of phenomena such as a sylvan epizootic from a pathological event to a mundane ecological phenomenon, remarks that sustain the second part of the baptising phrase “protection des cultures, construction de la nature,” but also comes terribly close to the kind of naturalism that shapes much writing in environmental history, apart, of course, from William Cronon’s magisterial *Nature’s Metropolis: Chicago and the Great West* (New York, 1991). If the association with the methodological problems of environmental history might seem a forced one, it is important to note that Castonguay himself positions *Protection des cultures, construction de la nature* as a contribution to environmental history, when he writes that:

Dans notre reconstitution des développements de l’entomologie économique se précisera une histoire environnementale du Canada, où *l’occurrence des infestations d’insectes nuisibles* constituera un révélateur des transformations de l’écosystème agro-forestier nord-américain (p. 20; emphasis added).

While it is difficult to identify the theoretical resources on which Castonguay draws to advance this argument about the role of insects in shaping institutional and cognitive transformations, the tone and wording sometimes evokes the ideas of Bruno Latour; but Latour would insist on attending to the ontological effects of reconfigurations such as that of an epizootic. Thus, not only would he avoid any references to “constraints,” but also attend, for example, to the way in which the Canadian Pulp and Paper Association’s sponsorship of the Green River Project resulted in a transformation of its own identity. Did members of the Canadian Pulp and Paper Association seek to extend their companies in time and space, so as to minimise the effects of insect depredations? Did they break up the structure of their companies, so as to ensure that insects on one plantation would not adversely affect the productivity of the whole, from felling and replanting to processing? What consequences did these actions have on the “occurrence des infestations d’insectes nuisibles”? Castonguay fails to raise any such questions, precisely the questions that differentiate *Nature’s Metropolis* from so much else that goes by the label of “environmental history.”

In the absence of such an account, which would entail the simultaneous consideration of transformations in the human world of science and business, as well as the life of insects, the phrase “protection des cultures, construction de la nature” is deceptive, insofar as the second part refers simply to the social construction of scientific knowledge, eliding along the way difficult issues concerning the relationship between science and nature, epistemology and ontology. In sum, while Castonguay painstakingly traces a bewildering number of institutional reconfigurations, sometimes impelled by changes in international markets for the products of the Canadian agricultural industries, the lives of insects in the fruit orchards of Nova Scotia and British Columbia, the wheat fields of Manitoba, and the forests of Ontario oddly remained what they had always been, apart from what researchers had to say about these lives, as they shifted their attention from the field to the laboratories of the Science Service of the Ministry of Agriculture.

Despite the above fundamental problem, however, Stéphane Castonguay’s *Protection des cultures, construction de la nature* will prove an invaluable resource for those interested in advancing Castonguay’s ambitious but unfulfilled promise to provide a more critical understanding of the relationship between knowledge and power.

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