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Marc J. Ratcliff, Genèse d'une Découverte: La Division des Infusoires (1765–1766)

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**MARC J. RATCLIFF, *Genèse d'une découverte : la division des infusoires (1765-1766)*, Paris :
Publication scientifiques du Museum national d'histoire naturelle, 2016, 751 pp., 45 €**

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Ratcliff traces the discovery of the division of infusoria in the mid eighteenth century by Horace-Bénédict de Saussure (1740-1799) through a micro-historical analysis of Saussure's journal, and uncovers the reception of this discovery through an extensive study of the works of, and correspondence between, major savants of the time (Bonnet, Needham, Spallanzani, etc.). The book's illustrations are absolutely gorgeous: they truly contribute to the pleasure of reading and immerse the reader in the story. The book also contains a critical edition of Saussure's notebook.

The first part of the book analyzes what Ratcliff calls the 'dynamic of confinement', by which he means to focus on the savant in his laboratory, confronted alone to the phenomenon of nature, and isolated from the social network in which he is otherwise embedded. Ratcliff highlights a particular scientific practice which he calls 'the experience of the text'. Analyzing the semantical storm within Saussure's notebook (*ca.* pp. 200-220), Ratcliff describes Saussure's struggle with different words belonging to the same lexical field—*étrangement, division, partage, séparation*—before stabilizing the fact and thus making the discovery. This minute and quantitative analysis is the most arduous passage to read—given the (necessary) fineness of the details—but it is also the most rewarding and that which leads to the most original and interesting contribution of the book. Being confronted with a new phenomenon is correlative to one's ability to name this phenomenon: during the dynamic of confinement, the

experience of the text may turn out to exceed the empirical aspect of the discovery, or so Ratcliff argues. A discovery, he points out, has usually been conceived as comprising two dimensions: an experimental procedure and the phenomenon produced and observed. To this, he forcefully shows that one should add what he calls a 'context of reality', comprising the whole conceptual apparatus necessary to name the phenomenon but also the ability, for a savant, to see differently in order to be able to apprehend the phenomenon. A rich and novel conceptual apparatus is elaborated by Ratcliff to elaborate on these ideas. Altogether, the dynamic of confinement leads to the transformation of the savant: the phenomenon he observes or produces through an experiment, his solitary activities of note-taking, and his experience of the text ultimately transform the author so that he can no longer see the world as before. This whole process of the transformation of the savant is then forgotten once the 'triplet'—experiment, phenomenon, context of reality—is constituted and once the savant becomes embedded in the 'dynamic of relation' through the writing of the publication.

The second part focuses on this 'dynamics of relation' and unveils several aspects of the reception of Saussure's work. Here Ratcliffe shows the central role played by Bonnet's network to settle Saussure's discovery, the importance of the national contexts in Italy, France, and Germany to understand the contrasted reception of Saussure's work. Ratcliff devotes a lot of attention to the practices of communication through the exchange of letters. Hinging on the theoretical elaborations of the first part, Ratcliff recasts the reception of the discovery and the stabilization of a scientific fact as the circulation and reappropriation of the triplet (experiment, phenomenon, context of reality) by other savants, engaged in a practice of 'reconfinement'. Certain methodological traditions in history and sociology of science have paid attention to the experimental practices and to their importance for the reproduction (or lack of reproduction) of experimental results. Ratcliff considers these experimental practices: he shows, for instance, how certain experimental tricks are concealed by their authors when they divulge their

discovery, and he points out the importance of the species studied to observe (or to miss) the division of infusoria. But he also aims at pointing out that, in some occasions, the results cannot be reproduced because a given savant lacks the proper the context of reality (rather than the experimental procedure).

Altogether, the book offers an exquisite description of many aspects of the life of a eighteenth century savant. In addition to the description of practices and norms known to readers of history and sociology of science and epistemology—e.g. the alliance and allegiance strategies needed to ensure the publicity and recognition of one's discovery; the superior norms conducting one's work (e.g. Needham metaphysical and religious inclinations *vs.* Bonnet epistemological prudence)—two interesting aspects of the life of savants recur throughout the book. One concerns the rhythm and pace of the savants' activities: how does the time spent in the laboratory and that dedicated to note-taking is managed? At what pace a discovery ought to be revealed (and to whom)? The second and more important aspect concerns the various textual and cognitive practices of the savants: from the experience of the text described in the first part and involved in private note-taking, to the codes ruling the practices of reading—which plays a great role in a dispute between Bonnet and Needham and, in the Republic of Letters, involves skills such as the recognition of the author of an anonymous manuscript—going through the maturation of writing, enabling the publication of the results scattered in a laboratory notebook.

Being neither a specialist of the historical period considered, nor of the scientific topic studied, I found that the important contribution of this book for me is methodological. The author is sometimes inclined to present his results as a contribution to the old philosophical debate between realism and relativism: focusing on the practices leading to the internal transformation of the savant—and not only on the circulation of a discovery in a network or a social space— would enable one to overcome the old relativism/realism dispute. We all know how heated this philosophical debate has been, and in many occasions, how ill-conceived has

the articulation been between a given methodology (e.g. the sociology of science or science studies as opposed to the history of ideas or to epistemology) and a supposedly associated philosophical position about the nature of the scientific facts (realist vs. relativist or constructivist). Thus, and given the content brought up in the book, I found the author much more interesting when he puts forward his results as a pure methodological (as opposed to philosophical) contribution. The opposition between sociology of science and epistemological approaches over the past decades has been so severe that the combination of ingredients from one and the other has been quite rare, save in specific methodological traditions such as historical epistemology focusing on the *longue durée* history of scientific norms and practices, or bourdieusian sociology of science. Combining micro-historical and epistemological analysis, the author points toward new directions. Against a pure history of ideas, focusing on theory and concepts, Ratcliff brilliantly shows the limits of such an approach: when this approach pays too much attention to the gathering of authors behind theoretical banners (preformation vs. epigenesis), Ratcliff demonstrates in the second part of the book that the most important factors accounting for by the state of the controversy were in fact codes and norms of communications in the Republic of Letters. But in the first part, Ratcliff also convincingly shows how important and interesting aspects of the practices of science may have been neglected, and precisely by the practical turn boosted by sociology of science. This methodological tradition, or so argues Ratcliff, has neglected the study of the transformation of the savant himself, “isolated” from the network and confined in the laboratory, when he his confronted not only to instruments, experiments, or machines, but also to acts of writing and thinking.