Ratcliff, Marc: **Genèse d'une découverte**: La division des infusoires (1765–1766). Paris, Muséum National d'Histoire naturelle, 2016. 751 p. Ill. € 45.–. ISBN 978-2-85653-788-6

Marc Ratcliff's book is ambitious. Apparently, it tells the story of how the Genevan savant Horace-Bénédict de Saussure realized in 1765 for the first time that *infusoria* possess the capacity to divide. Yet the microanalyses of this discovery and its diffusion are only a pretence to touch much broader topics. Saussure, in fact, is not the dominating figure in this voluminous book. Although he is thoroughly treated, other contemporaries, namely Charles Bonnet, Joseph Needham and Lazzaro Spallanzani take up the same, if not more space. Among other things, Ratcliff proposes new views on the epigenesis-preformism debate, on the emerging eighteenth-century experimentalism, on the philosophy of discovery, and nothing less than an alternative approach to the history and philosophy of science. He is hard on the "traditional historiography of science" as well as on socioconstructivism, criticising them for concentrating too much on biographical data, theoretical positions, and external factors, yet sometimes oversimplifying their standpoints. Instead, he proposes a microgenetic and linguistic-authorial approach and emphasizes the importance of the practice of writing scientific notes and texts for the development of ideas and the transformation of the author himself. Ratcliff, a trained psychologist and historian of science, at present head of the Jean Piaget Archive in Geneva, insists on the difference between confinement (seclusion within a working space) and relation (social interaction), between objects and the subject, and between authors and actors.

Genèse d'une découverte is subdivided into four parts. The introduction (pp. 13–33) is almost an essay on its own, a manifesto of Ratcliff's epistemological philosophy, then illustrated on the following 560 pages. The first chapter, *Dynamique de confinement* (pp. 35–245), introduces into the history of microscopy and the study of microorganisms in mid-eighteenth century. It then presents Saussure's entrance into the world of naturalistic research and his guiding epistemological principles, like the "Trembley effect", i.e. the extraordinary impact of the studies on the water polyp, and the "principe de Bonnet", i.e. humility in approaching Nature's marvellous multitude, preference of induction, and prudence in drawing generalisations. Ratcliff then comes to his central point, Saussure's confinement into his *studiolo* and his very personal quarrel to come at odds with the outcomes of two months of experimentation. In a very fine analysis, he demonstrates Saussure's changing observational and communicative strategies responding to procedural difficulties, unexpected results, and, in particular, the textual processes of transforming experiences into words. Ratcliff concludes that a tri-construction involves the savant, the process and the result, and calls it the *AEP model* of acting (*agir*), writing (*écrire*), and thinking (*penser*) (p. 229–240). According to this model, the author of a discovery does not merely make a new experience, but creates a new AEP, and the actors do not just communicate a new experience but act on the circulation of a new AEP triplet within the spaces of communication (p. 232).

The second chapter, *Dynamique de la relation* (pp. 249–561), treats the diffusion and reception of the discovery. Initially, it circulated only among the Genevan scholars. Four years later, after Needham's unauthorized announcement and Spallanzani's experimental sophistication, Saussure published it as a short letter in

Bonnet's *La Palingénésie philosophique* (1770). Ratcliff deeply analyses these and all other accounts, in particular that of Needham, who “deformed” Saussure’s observation, not because of his diverging theoretical (epigenetic) position, but rather because he followed incompatibly different epistemological principles, experimental practices and modes of scientific communication (pp. 473–474). Discoveries, Ratcliff concludes, are not simple “facts” but triplets of experimentation, a new phenomenon, and its (occult) context of reality. Their diffusion requires an obligate path (*parcours obligé*) of the integral triplet – 1. formulation in a *princeps* text, 2. public communication, 3. reconfinement by certain other actors, and 4. return of these actors to the dynamics of relation – and hence a continuous dialectics between confinement and relation.

The annex (pp. 591–679) contains Ratcliff’s critical edition of Saussure’s two research protocols on the *Observations sur les Animalcules des Infusions*, kept between August 1765 and March 1766. The final bibliography, the index of persons and the subject index complete this very careful and esthetical edition. It furthermore contains 15 tables and 155 illustrations of excellent quality. These are beautiful and pertinent, but not effectively part of a text that concentrates on linguistic processes and rhetorical strategies.

The book is well structured. The clear exposition and the short length of the subchapters facilitate the coming through the 700 pages. Nevertheless, it is not an easy read. The text is dense and often requires a certain amount of preliminary knowledge of the topics. Yet the abundance of meta-level discussion makes the book important for the history and philosophy of science in general, and the extraordinary richness in details and thoughts makes it worth reading at least a second time. One may not agree with some of Ratcliff’s points or find his epistemological philosophy as alternative as presented, yet his book changes the way to look at the history of experimentalism.

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