

REVIEW

TRANSFORMING THE GEOFFROY–CUVIER DEBATE

Hervé Le Guyader, *Geoffroy Saint Hilaire: Visionary Naturalist*.
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By Phillip R. Sloan

As one approaches the famous Paris *Muséum national d'histoire naturelle* from the north along the *rue Linné*, the corner of the *Muséum* property marks the sharp bifurcation of two streets bounding the large property, with the *rue Cuvier* running to the east to form the northeastern boundary of the grounds, and the *rue Geoffroy St Hilaire* continuing south to form the western limits. This material divergence of two Parisian streets seems to symbolise the two careers of these once famous professors at the museum, once closely joined, who parted ways in the 'great debate' of the 1830s that provided much of the backdrop for Darwinian transformism and morphology.

Hervé Le Guyader has provided a welcome return, through commentary and an excellent collection of documents, to Etienne Geoffroy Saint Hilaire's side of this classic controversy. Although the historical detail on this event has featured in historical discussions of 19th-century morphology since E. S. Russell's classic *Form and Function* of 1916, and the historical details on the controversy have been fleshed out in Toby Appel's excellent *The Cuvier-Geoffroy Debate: French Biology in the Decades Before Darwin* (Oxford University Press, 1987), there is no substitute for reading the texts themselves. Geoffroy's side of this discussion has not, however, been easily available. His two primary theoretical works, *Philosophie anatomique: des organes respiratoires sous le rapport de la détermination et de l'identité de leurs pièces osseuses* of 1818, and the *Philoso-*

phie anatomique des monstruosités humaines (1822), the preliminary discourses of both reprinted in this collection, have been available in recent printed form in the *Culture et civilization* series (1968), but the later *Principes de philosophie zoologique* of 1830, consisting of the primary documentation on the dispute with Cuvier in February and March of 1830 before the Paris Académie des sciences over the unity of type, has not otherwise been readily available prior to the publication of Guyader's French edition in 1998. The availability of a fine selection from these foundational texts in English translation forms an excellent companion piece to the University of Chicago's earlier collection, *George Cuvier, Fossil Bones, and Geological Catastrophes*, translated by Martin Rudwick (1997). With primary texts from both authors easily available, the historic debate over form, function, transformism, and the meaning of fossils in its historical complexity can be engaged with new insights.

Although the title might lead one to expect a scientific biography, this work is primarily a collection of texts with useful introductory materials that situate these historically. A biographical review of Geoffroy's life and career, detailing the initially close and creative relationship between Geoffroy and the brilliant Alsatian naturalist Cuvier, his junior by three years, opens the volume. As the first holder of the chair of quadrupeds, cetaceans, birds and fishes that resulted from the reorganisation of the *Jardin du Roi* into the *Muséum national d'histoire naturelle* in the tumultuous days of the summer of 1793, Geoffroy was instrumental in obtaining an appointment for Cuvier at the *Muséum* in 1795 as the understudy and later successor to Jean-Claude Metrud in the chair of comparative anatomy. Yet the two were to become estranged on theoretical, if not necessarily personal, grounds, leading to the clash after 1820 of these two titans of comparative morphology at the *Muséum*. Their growing conflict was manifest even geographically at the museum, with Cuvier, holder of the chair of comparative anatomy, in control after 1803 of his own *Galerie d'anatomie comparée*, and St Hilaire, professor of the vertebrates, esconsced in the zoology gallery at the site of the current *Galerie de l'évolution*. Thus in material arrangements, as well as in theory, two competing conceptions of the relation of form and function were developed that finally reached the level of public conflict in 1830 in the debates of the two *Muséum* professors.

The included texts present the opening of the dispute with the reprinting of Geoffroy's memoir on insects of 1820. For the first

time in this text, Geoffroy publicly extended his principle of the unity of plan and the theory of connections that he had developed in his treatise of 1818 with reference to the vertebrates, across one of the great divides erected by Cuvier between discontinuous *embranchments*. He argued that Cuvier's sharp distinction between animals with and without backbones could be breached by viewing the external exoskeleton of the crustacean and insect as analogous (or in Richard Owen's later terminology, 'homologous') to the vertebral column, with the animal living inside its vertebral column similar to the way the tortoise is arranged within its osseous framework. The conflict with Cuvier was inevitable after this point.

The primary bulk of the collection is devoted to the reprinting of major documents selected from Geoffroy's 1830 *Principes de philosophie zoologique*. In spite of its Lamarckian title, this work is not an exposition of transformism, but rather a collection of shorter documents in which Geoffroy presented his arguments against Cuvier in response to Cuvier's attack on the presentation at a *séance* of the *Académie* in February of 1830 of a report of two disciples of Geoffroy, Laurencet and Meyranx. These two young naturalists extended the claim of a unity of plan to the claim about the continuity of the vertebrate and invertebrate plans through the molluscs and fishes. This directly attacked the conclusion Cuvier had drawn two years previously in the opening volume to his *Histoire naturelle des poissons* on the relations of molluscs and fishes, in which he had criticised the Lamarckian speculation that fishes could be derived from molluscs.

Le Guyader develops in this discussion an important point that has tended, in my view, to be lost in the secondary literature – the point that the debate did not end in 1830, and that the relevance of the unity of plan debate to that of species transformism emerged in the subsequent discussions between 1830 and the death of Cuvier in 1832.

Reading these texts within the historical contextualisation provided by this volume displays the vitality and intensity of the issues. I also sensed the respect that Geoffroy continued to maintain for Cuvier, and the reciprocal regard that Cuvier had for his former mentor, in spite of the strains produced by this conflict. Too often, Cuvier has played a stereotyped role in a simplistic scientific drama, that of a pompous scientific authoritarian, beyond his scientific prime, currying favour with Emperor, King, Church

and Establishment, and allied against Lamarckianism and transformism, to the detriment of scientific progress. Textually working between the Rudwick and Le Guyader collections, we can now see more clearly the intellectual and methodological issues that were deeply in play in these debates. These included the relevance of embryology for morphology and classification. They pitted Cuvier's astringent empiricism against what he saw as the unwarranted speculations of German *Naturphilosophie*. It forced deeper consideration of the relations of form and function that eventually were clarified in the wake of this debate by Richard Owen in his distinction between 'analogy' and 'homology.' Cuvier's constant pressure on these points, represented by excerpts supplied by Geoffroy from summaries of Cuvier's arguments published in the *Journal des débats*, give a clearer view of the substantial issues under consideration. One understands more clearly why Owen, after his visit to Paris in the summer of 1831 and his meeting with both protagonists, returned to England determined to resolve this dispute in a way that did justice to both.

Le Guyader's text also provides a window into the wider social and political aspects of this debate that have been detailed by Toby Appel through the inclusion of reports on the debates from the journals *Le temps* and *Le national*. The collection closes with funeral orations pronounced at the death of Geoffroy by Michel Chevreul, Jean-Baptiste Dumas, Etienne Serres, and Edgar Quinet, which provide retrospective views of Geoffroy's work and the significance of his ideas 12 years after the death of Cuvier, in the same year that the transformist debates took on a new life with the publication of Robert Chambers's *Vestiges*.

A final chapter engages contemporary discussions of the relation of evolution and developmental biology that has generated renewed interest in Geoffroy's side of the story. The primary issue developed here is the new evidence (as of 1996) for the linkage of vertebrate and invertebrate developmental plans through the 'homeobox' concept, thus displaying that "ideas developed at the beginning of the nineteenth century, and so strongly attacked at the time, now find themselves confirmed by modern biology" (p. 254). This kind of presentism may be objectionable to some, and Le Guyader is not above joining in on the historical fight on the side of Geoffroy, but this contemporary connection gives the debate of the 1830s a new reason for reexamination.

Generally I found this a very readable text, with Majorie Grene's translation smooth and accurate. The extensive notes are useful, although the work lacks a bibliography. I regret that only a portion of the plates in the French original (*Geoffroy Saint-Hilaire: un naturalist visionnaire* (Belin, 1998) made it into the English version, with the omission of all those of biographical and geographical interest, and the quality of the reprinted anatomical plates is not quite up to the standard of the 1998 original. Those deeply interested in the controversy may for this reason want the French text as well. Nevertheless, I must express my appreciation to the University of Chicago Press for its continued interest in bringing a crucial series of texts to the community of the history and philosophy of life science. I do hope to see a paperback edition of this available soon.

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