Review

Reviewed Work(s): Die Fixierung des modernen Wissenschaftsideals durch Laplace by Henrich

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of those who became museum specimens—among them, that of a man known as "Vendovi," a supposed cannibal chieftain from Fiji, who was transported to America in 1842 as punishment for his part in a raid on a merchant ship. Vendovi (or Ro Veidovi, as he would be called today) was a victim of political rivalries between his fellow Fijians, the greed of the *bêche-de-mer* (sea-slug) traders, and the curiosity of the leaders of the American Exploring Expedition. He died shortly after arriving in New York, and his skull narrowly missed ending up in Morton's collection (instead, it became part of the National Institution for the Promotion of Science collection, in Washington, D.C.).

The Skull Collectors is an often-poignant narrative in which the history of racial science is successfully integrated into wider social and cultural histories. It deals with the complex legacy of American racism with intellectual candor and considerable sensitivity. Fabian works hard to avoid minimizing the enormity of what was done to the indigenous peoples of the Americas, while refusing to indulge in anachronistic condemnation of those who collected skulls. As a result, the book avoids glib conclusions and is likely to leave readers fascinated but deeply unsettled by what they have read.

JIM ENDERSBY

Jörn Henrich. *Die Fixierung des modernen Wissenschaftsideals durch Laplace*. 247 pp., illus., bibl., index. Berlin: Akademie Verlag, 2010. €59.80 (cloth).

The famous French mathematical scientist Pierre-Simon Laplace (1749–1827) is remembered for his work in Newtonian celestial mechanics, where among his many achievements he demonstrated the stability of the three-body system consisting of the Sun, Jupiter, and Saturn. He also made various contributions to mathematical analysis, was an important contributor to the theory of errors (the Laplace-Gauss synthesis), and promoted molecular approaches to the investigation of such phenomena as capillarity and optical refraction. His popular book on astronomy, *Exposition du Système du Monde*, was widely read and cited in the nineteenth century.

The first part of Jörn Henrich's book is devoted to the Newtonian origins of Laplace's ideas in physical astronomy, while the second focuses on Laplace's development of methods of celestial mechanics. The author then turns to an examination of the conceptual foundations of Laplace's theory of celestial dynamics. Attention is paid here to the idea of the determinism of physical laws that is traditionally attributed to Laplace. This part is followed by a study of the *Précis de l'histoire de l'astronomie*, a historical treatise that forms the concluding chapter of Laplace's *Système du Monde*. Henrich also includes a discussion of Laplace's scientific philosophy. In the final part of his book he looks at the reception (*Wirkungsgeschichte*) of Laplace's scientific thought in the nineteenth century.

Henrich's portrait of Laplace is rather eclectic and wide ranging, drawing on the original texts, philosophy, some social history, and technical commentaries. His general point of reference is informed by older historical writers such as Abraham Wolf, Alexandre Koyré, and Max Jammer, individuals whose work provided a base during the 1960s for exploring the history of physical science. An important background figure in Henrich's narrative is Ernst Mach, who saw the entire history of mechanics since 1700 as the consolidation of Newtonian particle dynamics. Henrich passes over a large body of historical work on analysis and mechanics from the past half century that is relevant to understanding Laplace's conception of mathematical analysis and his contributions to mechanics. On the other hand, he makes reference to work of many philosophically inclined authors whose writings will probably be unfamiliar to historians of science and who deserve to be better known. Overall, his book is a stimulating and informative addition to Laplacian studies.

I can only touch on a couple of the themes explored by Henrich in his study. He calls attention to the analytic approach of Leonhard Euler and Joseph-Louis Lagrange, with its rejection of geometric modes of representation and visualization. He situates Laplace within this tradition, noting that in all of Laplace's books on celestial mechanics, astronomy, and probability not a single graphical image may be found. This aspect of Laplace's science is not explored in any depth but is taken in a general way to be an expression of his mechanistic worldview. It is nonetheless worth noting what a striking characteristic it is. Whereas diagrams and figures abound in the writings of authors at the beginning of the eighteenth century, they appear nowhere in the thousands of pages of Laplace's collected writings. Laplace was an applied mathematician, and his nongeometric analytic style did not have quite the same foundational significance that it possessed in Lagrange's mathematical philosophy. It was nevertheless a fundamental feature of Laplace's technical outlook. In the nineteenth century the formal approach of these researchers

was replaced by a stronger conceptual and intentional take on the subject, and geometric modes of theorizing also underwent a revival.

Referring to Laplace's historical writings, Charles C. Gillispie has noted that "Laplace's remarks on the great discoveries of the past are further evidence—if any is needed—that inventiveness in one discipline can accompany banality in another" (*Pierre-Simon Laplace, 1749–1827: A Life in Exact Science* [Princeton, 1997], p. 172). Henrich is more sympathetic to Laplace and provides an extended discussion of his historical précis. Laplace identified three factors that govern the development of astronomy: technological innovation (telescopes, clocks), advances in mathematics and mechanics, and individual intuition and resourcefulness. It is interesting to compare this balance with the situation today, where technological advances completely overshadow individual intellectual achievement. Although Laplace's history may seem to rely on simplistic notions of progress, the period in which he wrote and his Enlightenment perspective must be taken into account. Henrich credits Koyré with having initiated modern notions of historical sensitivity and a diachronic conception of history. He also suggests that a change in perspective occurred with the advent of such fields as sociology, hermeneutics, psychoanalysis, and cultural studies.

Laplace obtained many important results in the theory of perturbations, planetary stability, potential theory, and the calculus of probabilities. To be sure, he was not a major contributor to theoretical mechanics on the level of Jean d'Alembert, Euler, or Lagrange. In the nineteenth century celestial mechanics came to be based on the mathematical methods of Hamilton-Jacobi theory, developments that drew on older ideas not of Laplace but of Lagrange and Siméon Denis Poisson. Laplace was nonetheless a leading man of science during a highly significant period in the history of French mathematical physics. He figured prominently in the educated public's understanding of science and embodied the ideal of enlightened rational optimism. His intellectual influence was evident not just in applied mathematics but in concepts of evolution derived from his theory of the origins of the solar system. *Die Fixierung des modernen Wissenschaftsideals durch Laplace* is recommended to anyone who wishes to gain greater insight into this extraordinary scientist.

CRAIG FRASER

Jonathan Hodge; Gregory Radick (Editors). *The Cambridge Companion to Darwin*. xiv + 548 pp., tables, bibl., index. Second edition. Cambridge: Cambridge University Press, 2009. $90 (cloth); $34.99 (paper).

The two representations of Darwin in my cluttered office symbolize the challenges faced by Jonathan Hodge and Gregory Radick in editing *The Cambridge Companion to Darwin*, now in its second edition.

The first representation is a photograph from the mid 1850s by Maull and Polybank. Darwin frowns intensely. His scalp is bald, but his remaining hair has not yet turned gray, nor have his bushy muttonchops developed into his iconic beard. He wears a black frockcoat over an embossed waistcoat. A raised collar, circled by a wide neckcloth, juts aggressively above his jawline. The second representation is a polyresin bobblehead, manufactured sometime in the past decade. This whimsical Darwin sports the famous gray beard. A black frockcoat covers a gray business suit of distinctly modern cut. A Windsor-knotted necktie runs under now-conventional folded collar points. The photograph is not merely an ideologically neutral image of a long-dead man on a particular day in the 1850s: it was taken for the Literary and Scientific Portrait Club. But the purposes of the photograph were as thoroughly Victorian as Darwin's dress. And the bobblehead is not, of course, simply a playful rendition of an older Darwin. It embodies an abstract body of thought molded into a familiar and symbolic human form for twenty-first-century consumption: this iconic Darwin is as contemporary to us as his anachronistic tie style and shirt collar. The Victorian Darwin and his modern-icon doppelganger have distinct, if overlapping, personalities—both deserve a "companion" if we are to locate Darwin's significance.

Hodge and Radick recognize this by organizing the *Companion* into distinct historical and philosophical clusters. In passages added to this new edition's partially rewritten introduction, the editors insist that "understanding Darwin's theories as Darwin understood them means taking seriously all that Darwin took seriously, unfamiliar and even uncomfortable as the enterprise might sometimes be," and emphasize that "philosophical responses to Darwin now are as much to Darwinian themes in present-day science as to Darwin's own work" (p. 2).

Radick, in an essay unchanged from the first