

Systemes de la nature and Theories of Life: Bridging the Eighteenth and Nineteenth Centuries

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THE MAIN PURPOSE OF THIS ESSAY is to examine the evidence available to argue that several themes characterizing eighteenth-century reflections on life, inspired by, among others, Lucretius's *De rerum natura*, Benoît de Maillet's (1656–1738) *Telliamed*, Julien Offray de La Mettrie's (1709–51) *Système d'Epicure*, and the works of Georges-Louis Leclerc, comte de Buffon (1707–88), prospered well into the first half of the nineteenth century. They survived fierce opposition by academic and institutional science and by conservative commentators pronouncing that those doctrines had contributed to the crimes of the French Revolution. Denunciations, prudent silence, and scorn did not prevent widely circulating editorial enterprises and popular authors from embellishing on an eighteenth-century tradition that was still alive and relevant to early nineteenth-century culture.

I will start by looking at two relatively recent additions to the list of late eighteenth-century precursors of Lamarck or of Darwin: Jacques-Antoine Grignon des Bureaux (1714–96) and Nicolas-Edme Rétif de la Bretonne (1734–1806). Rather than assessing whether such claims are justified, I will treat the two authors as readers and witnesses to the circulation of doctrines of life available at the time. I will then show that in the case of Rétif de la Bretonne, the deepening of our understanding of the context in which his work appeared highlights complex features of pre-1800 debates about nature. Around Rétif, authors and publishers were engaged in the battle for intellectual authority—if not personal survival—in the politically charged years following the end of the Terror in 1794. I will briefly consider the printing activities of the Cercle social, a group of politicians and writers that disbanded after 1793, though their presses remained active until 1800, publishing also in the field of science. In 1796 they printed not only *Philosophie de la nature*

by Rétif, to us (at first sight) the fruit of a chaotic imagination, but also Pierre-Simon Laplace's (1749–1827) *Exposition du système du monde*, two works that clearly should not have appeared in the same publisher's list, according to our anachronistic judgment. The final section of this essay will be devoted to tracing the legacy of eighteenth-century doctrines of life—duly amended and reinterpreted—well into the early decades of the nineteenth century. By ignoring continuities through generational and political change, and the authors who successfully attempted to adapt old doctrines to new intellectual and political agendas, we have implicitly endorsed the views of small groups of conservative representatives of natural sciences active throughout Europe in the early nineteenth century. They insisted that proper and safe science did not mess with cosmological systems of nature and advocated legitimacy through their endorsement of “positive,” factual knowledge, diametrically opposed to the spirit of system. After 1859, the immense success of Darwin's *On the Origin of Species* was seen by readers throughout Europe (who had already appreciated Robert Chambers's *Vestiges of the Natural History of Creation*, 1844) as evidence that natural knowledge was again nurturing lofty views of nature and its processes and vindicating its role as the sound basis of all philosophy. Eighteenth-century philosophers of “Nature” were at long last vindicated.

NEWLY APPOINTED PRECURSORS: GRIGNON DES BUREAUX AND RÉTIF DE LA BRETONNE

1.1. Jacques-Antoine Grignon des Bureaux

It is not my intention to embark upon a discussion of precursors, or forerunners, of evolution, as a famous 1959 title defined those people who had something new to say on life.¹ Thus, there will be no detailed discussion of contributions by past stars of natural philosophy and the life sciences such as Pierre-Louis Maupertuis (1698–1759), Buffon, or Denis Diderot (1713–1784), even though their names will necessarily be referred to. As is well known, classifying any of them as precursors of Darwin was based on a tradition of scholarship that loved to take excerpts out of context to support overreaching claims. The unsafe epistemological path leading to the hunt for precursors has since long been barred by solid arguments and sophisticated scholarship.² Yet, many distinguished colleagues are still fascinated by authors whose views appear to be announcing nineteenth-century evolutionary epiphanies. In the following pages, I will briefly examine two relatively recent additions to the list of precursors, to underline that “precursors” are an alluring myth but a false start. These figures are nevertheless of great interest for what they actually said and, especially and crucially, for what they represented in the politics of culture and the intellectual priorities of their times. Instead of being steps in a more or less linear development, they often gave voice to contemporary concerns and conceptual traditions and represented styles of writing about nature at times far removed from later (and our) practices. It will be argued below that sections of the educated public throughout late eighteenth-century Europe, ranging from printers and typesetters, through penmen and professional writers, up to specialists and scientific personnel active in institutions of higher learning, toyed with views of the universe and of

¹ B. Glass et al., eds., *Forerunners of Darwin, 1745–1859* (Baltimore: Johns Hopkins University Press, 1959).

² C. Limoges, *La sélection naturelle: Étude sur l'évolution d'un concept (1837–1859)* (Paris: Presses universitaires de France, 1970), offered a pioneer critique of “precursors” in the biological sciences.

life, of mankind and its future prospects. They did so, in part, as a means of asserting their individual titles to social and intellectual status—when other titles, such as wealth or birth, failed.

Throughout the middle and later decades of the eighteenth century, the considerable consumption of printed and at times manuscript material offering narratives of creation (or of eternity) in competition with (or set against) scriptural accounts opened spaces of visibility to individual authors in need of expanding their social surface and of increasing their means of survival. I will consider their views as commodities offered in the market of ideas, thereby avoiding anachronistic (albeit understandable) judgments as to the plausibility and solidity of the doctrines put forward. Thus, while I will point out theoretical weaknesses and at times serious flaws, I will continue to insist that our judgment is based on anachronistic assumptions: the wild nature of a set of propositions never prevented them from being discussed, refuted, and also supported, at times in the most unexpected quarters. A complementary thesis will insist that the proliferation of texts and authors during the last two decades of the eighteenth century is essential to understanding early nineteenth-century European debates on life. The point may sound self-evident; it is not trivial, however, to suggest that authors such as Jean-Baptiste Lamarck (1744–1829) in the early 1800s or successful collective enterprises such as the first edition of the *Nouveau dictionnaire d'histoire naturelle* (1803–4) have to be read within the context of debates—and their social functions—animating the last two decades of the eighteenth century and their fate in the political and intellectual backlash that ended the revolutionary decade. Refurbished versions of older theories claiming that life originated in seeds, either of terrestrial or of extraterrestrial origin, that the newly formed Earth and/or its oceans enjoyed a level of fertility long since lost, that life-forms were more plentiful and varied in earlier times, and that the organisms we see today are the well-adapted remnants of extended loss affecting the far richer primordial fauna and flora continued to be put forward in several locations and forms of cultivated and popular communication throughout the early decades of nineteenth-century Europe.³ Also debated was the idea that processes of transformation caused by behavioral or climatic change could be reversed: that, for instance, marine forms that had adapted to life on the emerging landmasses could regain the ocean, human beings included.⁴ In other words, the legacy of several so-called precursors was not expressed in the complex theories of evolution put forward by Lamarck or Darwin. Through transformations and adaptations (appropriately purged of materialist and atheistic overtones), eighteenth-century Epicurean atomism (the doctrines put forward in the verses of Lucretius) and the prose of de Maillet's *Telliamed* continued to provide excitement and philosophical entertainment to a sizable section of the European reading population.⁵

³ On the long history of the concept of “seeds,” see, e.g., H. Hirai, *Le concept de semence dans les théories de la matière à la Renaissance: De Marsile Ficin à Pierre Gassendi* (Turnhout: Brepols, 2005); C. Cohen, “Benoit de Maillet et la diffusion de l’histoire naturelle à l’aube des Lumières,” *Revue d’histoire des sciences* 44 (1991): 325–42; C. Cohen, *Science, libertinage et clandestinité à l’aube des Lumières: Le transformisme de “Telliamed”* (Paris: Presses universitaires de France, 2011).

⁴ A. Fortis, *Mémoires pour servir à l’histoire naturelle et principalement à l’oryctographie de l’Italie, et des pays adjacens*, 2 vols. (Paris: J. J. Fuchs, an X [1802]), 208–12, formulated the hypothesis that one day a few score of infants could be operated upon just after birth to allow them to regain the seas and reconquer the world we once belonged to. *Telliamed* too had alluded to this possibility.

⁵ Editions of the *De rerum natura* by Titus Lucretius Carus are available online in the original Latin and translated into several languages. B. de Maillet, *Telliamed ou entretiens d’un philosophe indien avec un missionnaire français, sur la diminution de la Mer, la formation de la Terre, l’origine de l’Homme* (Amsterdam: L’Honoré, 1748); English-

Our first precursor has been identified by recent scholarship. In 2002, one of the leading French and European historians of alchemy, Sylvain Matton, edited an anonymous manuscript entitled *Tintinnabulum naturae* and bearing the date 1772 on its cover, though only an early nineteenth-century copy of the text has survived. Matton's admirable devotion to scholarship brought much-sought-for results when in 2012 he issued a second edition of the text, announcing the identification of its author, Jacques-Antoine Grignon des Bureaux (1714–96).⁶ A former military man, des Bureaux had been a provincial érudit and author, owner of a library of some two thousand volumes, who lived in Ervy-le-Châtel, forty kilometers southwest of Troyes. It is difficult to imagine a setting more provincial than Ervy: yet, it was a French province, brimming with ideas and Enlightenment priorities. According to Matton, to des Bureaux belongs the title of true founder of modern evolution. He was the real precursor of Lamarck and Darwin and dared more than Maupertuis, Diderot (at least in the fewer than a handful of his works known at the time), or Buffon ever did. Matton reached this conclusion after joining the quasi-unanimous chorus of historians denying that the classic “forerunners of Darwin” really deserved the honor: “From Benoit de Maillet to Charles Bonnet, passing through Maupertuis, Buffon, Diderot, and Jean-Baptiste Robinet, several thinkers of the eighteenth century have been declared precursors of Lamarck, if not of Darwin. It could be argued that this was a mistake, in the sense that even if each of them put forward several elements composing the explanatory system of transformism, all these elements never constituted a truly evolutionary doctrine: the very idea of a general evolution of species was missing from the conceptual scaffolding of these pretended precursors.”⁷

Matton devoted a few pages to pointing out the conceptual shortcomings of the pretended “precursors,” all unfit for the role with the single exception, needless to say, of his des Bureaux. Matton rejected the view put forward by a critic, Stéphane Schmitt, that des Bureaux was not adding much to what Jean-Baptiste Robinet (1735–1820) and Diderot had already said.⁸ Matton insisted that des Bureaux was the first author to claim a genealogical descent (or, better, “ascent”) of species: the earliest living organisms were plants, followed by zoophytes, invertebrates, and vertebrates, up to monkeys and finally man, the crowning of Nature's eternal processes. The origin of life, according to des Bureaux, was “lost in eternity” and occurred when endless forms of globular combinations, invisible, became “palpable” and “visible,” giving birth to the earliest vegetables. Vegetables managed to reproduce, and new forms were subjected to further variations through crossbreeding and adaptation to varied climatic conditions. Combinations of vegetable “germs” produced zoophytes, which learned to reproduce by budding new organisms out of their own bodies, and to move freely, thereby increasing the chance of further cross-fertilization and hybridization. From this stage on, “progressive organization” took over, multiplying forms and increasing levels of complexity: “Stupid animals followed Zoophytes; afterwards, due to the

language edition, London: Osborne, 1750; the English-language edition has been edited by V. Carozzi (Urbana: University of Illinois Press, 1968).

⁶ S. Matton, ed., *Tintinnabulum naturae: Rêveries d'un individu semi homme semi bête engendré d'une négresse et d'un orang-outang suivi de Pensées métaphysiques lancées dans le tourbillon et de quelques poésies et pièces fugitives, par un solitaire de Champagne; Edités et présentés par Sylvain Matton, avec des études de Miguel Benitez, Alain Mothu, Alain Niderst et Charles Porset* (Paris: SÉHA-Archè, 2002); S. Matton, ed., *Jacques-Antoine Grignon des Bureaux: Rêveries métaphysiques d'un Solitaire de Champagne, précédées de son "Tintinnabulum naturae" et suivies de quelques poésies et pièces fugitives* (Paris: Honoré Champion, 2012).

⁷ Matton, *Jacques-Antoine Grignon des Bureaux*, 85n4.

⁸ S. Schmitt, review of *Tintinnabulum naturae*, by Sylvain Matton, *Revue d'histoire des sciences* 59 (2006): 168–69.

variations produced by a slow and imperceptible progression, appeared the animals we know capable of reflexion and memory. These included the different species of monkeys filling the small interval that exists between animals and the savage. The nature of the Planet called Earth is opposed to the realization of a combination (of forms) more perfect and happier than the one represented by social and civilized humanity.”⁹

Matton argued that none of des Bureaux’s contemporaries envisaged a progressive, ascending filiation of forms: they rather spoke of seeds, each generating a particular form; of combinations of organic molecules, each attracted to similar ones, generating well-defined species; of “embryos” produced by matter at the dawn of time; or of a single generic animal form capable of endless adaptations and diversifications. Diderot, for instance, had accepted the hypothesis of the existence of a single animal form, the prototype organism that had generated all the forms we see living in today’s world: a hypothesis Buffon had toyed with, only to reject it with firmness. Diderot acknowledged that he had borrowed the idea but wiped aside the arguments against it. The endorsement of the hypothesis Buffon had denied continued for a long time. In the 1830s Étienne Geoffroy Saint-Hilaire (1771–1844) regretted that Buffon, after hitting on the fundamental concept of a single plan for all animals, rejected it in fear of the consequences that could have been deduced from the doctrine; nevertheless, he attributed to the great naturalist the role of precursor of his own doctrine of the Unity of Plan.¹⁰

Against de Maillet, who had argued that all living organisms had each been independently generated in the seas through the assemblage of similar seeds and then had adapted to terrestrial and aerial life, des Bureaux contemplated the ascending chain of living beings without speculating on their origin, whether on land or in the sea. In fact, Matton finds no trace of des Bureaux having read de Maillet, and indeed the sketchy manuscript does not mention any source at all. So, despite Matton’s erudite and painstaking philological probing, the text is difficult to assess and to place within a context. Des Bureaux was certainly a sophisticated provincial reader and a daring spirit, yet it is not easy to trace his intellectual debts. Further research on the actual contents of his library may of course help and would indeed be of great interest in highlighting the range of authors and topics a provincial érudit felt he had to own. It is, however, to be pointed out that des Bureaux, like almost everybody else around him, cared little about accuracy of quotation or unacknowledged borrowing. Philology, as always an indispensable tool in situating a body of doctrines or the intellectual ascendancy of a given author, has to come to terms with the fact that commentators felt free to adapt, distort, interpret, and embellish whatever they picked up in their incursions into books, encyclopedias, journals, and correspondences.

In my view, one of the contributors to Matton’s 2012 edition of the *Tintinnabulum*, Cédric Grimoult, did strike the right note when he pointed out that the real interest of des Bureaux is his witnessing of the widespread contemporary interest in naturalistic cosmologies, reaching even Ervy-le-Châtel, after having spread to Troyes.¹¹ Yet, something more could be said about mid- and late eighteenth-century debates on nature’s laws and processes, of which the question of life was one among other concerns, and perhaps not the most important one. One should pay more attention, for instance, to the enduring fascination for Lucretius’s *De rerum natura*, a text

⁹ Matton, *Tintinnabulum naturae*, 162n4.

¹⁰ E. Geoffroy Saint-Hilaire, “Buffon,” in *Encyclopédie nouvelle* (1837), 2:105–11.

¹¹ C. Grimoult, “Comparaison des idées évolutionnistes du ‘Solitaire de Champagne’ et de Maupertuis,” in Matton, *Jacques-Antoine Grignon des Bureaux*, 137–42, 142.

still read and studied as the main source of information on ancient atomistic theories. Matton reconstructed des Bureaux's atomism and correctly referred to Pierre Gassendi (1592–1655) and other contemporary supporters or opponents of Epicurus and Democritus, but he did not mention Lucretius. True, des Bureaux's views of the origin of life, sketchy as they are indeed, showed significant differences with respect to the Latin poet and philosopher. For instance, there is no trace in des Bureaux of Lucretius's idea that numberless early forms of life, or even organs generated in the fertile primordial mud, were not well adapted and so perished.¹² Yet, the discussion of atomism and of naturalistic cosmologies in the eighteenth century should include Lucretius, so omnipresent that authors did not even bother to mention his name or to refer with precision to the poem. This was the case with de Maillet, La Mettrie, Diderot, and Maupertuis: each knew *De rerum natura* almost by heart and used what he needed in order to propose his own version of a millennial tradition of "true" insights into the basic constitution of matter. Equally omnipresent was de Maillet's *Telliamed*. Toward the very end of the century, a journal significantly entitled *Soirées littéraires*, edited by the former king's librarian the abbé Jean-Marie-Louis Coupé (1732–1818), claimed that everybody had read the work, even ladies of accomplished education. Decades later, during his journey to England, Asa Gray (1810–88) listed *Telliamed* among the books to bring back to the Harvard library: the curiosity about the work was still high, even for someone who shared nothing—to say the least—of de Maillet's outlook.¹³ Lucretian atomism and the account of the origins of life his poem provided and de Maillet's *Telliamed* in no way led to "Lamarckian" or "Darwinian" evolution. But, as I will argue below, reformulated and revised in the light of the latest "scientific" theories, they were part of a philosophical and "scientific" tradition that remained strong for a long time and that ran parallel to, and at times crossed paths with, specific "evolutionary" concerns expressed in Lamarckian or Darwinian terms. Even Lamarck's work could be, and was, seen by contemporaries as treading in the footsteps of Lucretius and *Telliamed*.¹⁴ Rather than accusing such commentators of straightforward theoretical blindness, in the final section of this essay I will examine the priorities and styles of naturalistic writing and thinking that made such readings possible.

1.2. Nicolas-Edme Rétif de la Bretonne

The second fascinating author recently called upon to join the Hall of Fame of the precursors of Lamarck and Darwin is Rétif de la Bretonne. In two seminal articles, published in 1986 and 2010, Laurent Loty argued that Rétif's *La découverte australe par un homme-volant* (1781) and his *La philosophie de monsieur Nicolas* (1796), the products of the fertile imagination of the novelist and polygraph, powerfully contributed to exposing the reading public to a dynamic view of life and its power of adaptation.¹⁵ Loty never claimed that Rétif actually "preceded" Lamarck,

¹² Lucretius, *De rerum natura*, bk. 5.

¹³ J.-M.-L. Coupé, *Soirées littéraires* 12 (an VI [1798]): 258.

¹⁴ See, e.g., J.-J. Virey, "Vie," in *Dictionnaire des sciences médicales* (1821), 57:473–75; J. MacCulloch, *A System of Geology with a Theory of the Earth* (London: Longman et al., 1831), 422–23; news of the death of Lamarck in *L'ami de la religion et du roi* 62 (1830): 216–17.

¹⁵ L. Loty, "La découverte australe (1781): Une utopie évolutionniste et eugéniste," *Études Rétiviennes* 2 (1986): 27–35; L. Loty, "L'invention d'un transformisme généralisé (1781–1796): L'imagination d'une temporalité naturelle entre 'perfectionnement' et 'révolution,'" in *Temps, durée, dans la littérature des Lumières et ses marges*, ed. J.-J. Tatin-Gourier and J. M. Goulemot (Paris: Éditions Le Manuscrit, 2010), 33–71; G. Berkman, "La physique de Monsieur Nicolas ou l'incertain roman de la génération," *Études Rétiviennes* 30 (1999): 7–24;

and Loty rightly pointed out that his doctrines are of historical interest in themselves. He did, however, contrast Lamarck's hesitation over joining the promutation camp until 1800 with Rétif's flamboyant insistence, well before this date, on the constant changes living forms had undergone.¹⁶

Even though Rétif had been planning *La philosophie de monsieur Nicolas* for at least fifteen years, it was probably put together in haste, as had been the case with much of his production. The three volumes occasionally reflect the author's changes of mind, as well as his readings while working on a given section.¹⁷ It is not that Rétif accounted for all the sources he had in mind when proposing his own version of a naturalistic cosmology. Yet, when compared with des Bureaux, Rétif's work offered a more generous glimpse at the sources available to an amateur author and voracious reader of the time. Finally, volume 3 contains a series of additions commenting on systems of the universe and theories of life promulgated from the time of pre-Socratic philosophers up to the *Exposition du système du monde* by Laplace, also published in 1796. Typically again, the information was often freely lifted from encyclopedic compilations available at the time, such as the very recent *Théorie de la Terre* (1795; 2nd ed., 1797) by Jean-Claude de la Métherie (since 1794 Delamétherie, 1743–1817). Rétif initially identified the mineralogist as “Lammethrie junior,” probably led astray by the similar pronunciation of the surnames La Mettrie and La Métherie. Buffon was also a key author for Rétif, deserving equal shares of eulogy and vituperation, a treatment the novelist reserved even for his closest friends.¹⁸ D'Holbach's *Système de la nature* was censured for its advocacy of chance: Rétif had no patience with blind combinations of atoms.

Although we must bear in mind that no account of Rétif's work can ever achieve a satisfactory level of coherence since it is hard to find much in his texts, the novelist claimed that during the early 1780s, spurred by his reading of *L'autre monde: ou Les états et empires de la Lune* by Cyrano de Bergerac (1619–55), he developed a series of deductions drawn from his own reasoning powers and supported by the overall system of analogies and “types” pervading the entire universe. He was pleased that famous astronomers (including Laplace and Jérôme Lalande, 1732–1807), as well as naturalists he had only afterward read, supported in part the conclusions he had reached, though all had fallen short of the ideal system he himself had finally elaborated. The universe was made up of an infinite number of suns, which he saw as living organisms going

I. Lo Tufo, “Images of the Natural (and Social) Universe in Rétif de la Bretonne's *La découverte australe*,” *Studies in the History and Philosophy of the Biomedical Sciences* 34 (2003): 1–50.

¹⁶ On Lamarck's tortuous path to transformism, see R. W. Burkhardt, *The Spirit of System: Lamarck and Evolutionary Biology* (Cambridge, MA: Harvard University Press, 1977); P. Corsi, *Lamarck: Genèse et enjeux du transformisme, 1770–1830* (Paris: Presses universitaires de France, 2001).

¹⁷ D. Coward's *The Philosophy of Restif de la Bretonne* (Oxford: Voltaire Foundation, 1991) remains the best comprehensive study of Rétif to date. See also P. Testud, *Rétif de la Bretonne et la création littéraire* (Geneva: Droz, 1977); J. Castonguay-Bélanger, *Les écarts de l'imagination: Pratiques et représentations de la science dans le roman au tournant des Lumières* (Montreal: Presses de l'Université de Montréal, 2008). Coward and Castonguay-Bélanger assume that Rétif's science was disqualified in the eyes of contemporaries (and of historians) because he relied on, among others, de Maillet and Delamétherie. In his excellent monograph, Coward calls Delamétherie “a dilettante with too much imagination” (429). See also C. Monselet, *Rétif de la Bretonne* (Paris: Alavares, 1854); P.-L. Jacob (P. Lacroix), *Biographie et iconographie de toutes les ouvrages de Restif de la Bretonne* (Paris: Fontaine, 1875).

¹⁸ Rétif de la Bretonne, *Philosophie de Monsieur Nicolas*, 3 pts. in 1 vol. (Paris: Imprimerie du Cercle social, 1796), 1:8. Rétif did not spare even his closest associate, the famous journalist and commentator Louis-Sébastien Mercier; see Coward, *Philosophy of Restif de la Bretonne*. On Mercier, see R. Darnton, *The Forbidden Best-Sellers of Pre-revolutionary France* (New York: W. W. Norton, 1995).

through phases of birth, maturity, reproduction, and death. In the fullness of youth, suns would ejaculate masses of fiery matter, producing comets and, once the latter's orbits had stabilized, planets. Planets lost speed at an annual rate (he claimed that this was his major discovery, placing him above Newton) and would eventually fall back into the sun; the star, too, was destined to cease to exist. Suns, planets, and comets were filled with life-forms, adapted to the physical circumstances of the celestial bodies they inhabited. Just as human beings hosted parasites, so did Earth (namely, plants, animals, and us) and all celestial bodies.

Concerning life, throughout his *Philosophie* Rétif contrasted two main hypotheses. The one his reason liked most was that life-forms were ejected from suns together with the fiery materials. Over time, he had, however, found the doctrines expounded by de Maillet more convincing, even though *Telliamed*, and Buffon afterward, required the surface of Earth to have cooled down considerably before life could appear.¹⁹ Rétif's account of the theories put forward in *Telliamed* was far from accurate, however. He wrongly attributed to de Maillet the view that only one type of vegetable, animal, or mineral had originally been produced (more in line with the hypothesis Buffon had repudiated) and that all the forms we see today developed from such elementary prototypes. His own view was that "seeds" (*germes*) for each form were produced in given localities; the seeds for the different races of man originally developed in the tropics and afterward adapted to a variety of circumstance throughout the globe. Civilization and the arts granted the white man his current, albeit precarious superiority. Man, firmly placed within the family of monkeys, remained for him the ultimate goal nature was striving toward. In fact, various "inferior forms" were developing to reach the level of perfection enjoyed by mankind, which explained why certain types of men still bore resemblances—moral and physical—to dogs, pigs, monkeys, or horses trying to perfect themselves.²⁰ Toward the end of volume 3, in the last summing up of the views he had developed in the previous two volumes, he stated:

Everything confirms this truth, that man has gone through several animal species, when springing out of oysters and fishes to climb toward humanity. Everything confirms that man cannot be terrestrial, that is, emerging directly from the earth; that he has come out of animals, not vegetables, as herbivores did; that he ascended step-by-step from a less perfect to a more perfect species; that an infinity of animals, less happy in their birth, less nourished, fixed themselves in the species through which they were passing; that, in the youth of Earth, only the animals better formed and better nourished reached higher levels; and when all this happened at various successive levels, these species reached the last level, the one of humanity. But how many things were necessary! There are perhaps but one man or two in every country, whereas billions of individuals have remained oysters, amphibians, etc.²¹

The complexities and contradictions of Rétif's *Philosophie* and natural philosophy I have only alluded to here have been commented upon by Laurent Loty, David Coward, and more recently Joël Castonguay-Bélanger. Within the scope of this essay, it is by now almost superfluous to insist that Rétif can in no way be seen as a precursor of Lamarck or of nineteenth-century evolution. The philological work required to fully trace his borrowings, misreading, and at times his silence concerning authors he must surely have read or skimmed through has never been

¹⁹ Testud, *Rétif de la Bretonne*, 214, 216.

²⁰ Rétif de la Bretonne, *Philosophie*, 2:77–83.

²¹ *Ibid.*, 3:176–77.

attempted and would necessitate considerable time and extensive readings. Among the missing persons within the *Philosophie*, Lucretius comes again to mind, a poet whose work Rétif devoured in his youth.²² I would like to briefly call attention to La Mettrie, whose name is present in the *Philosophie* only as a wrong spelling of Delamétherie's, as we have seen above. Several passages of Rétif's work appear to echo La Mettrie's *Système d'Epicure* (1751), which was reissued in 1796 in a three-volume edition of his works.²³ In particular, La Mettrie's reinterpretation of the Lucretian account of the origins and transformations of life in the light of *Telliamed's* insistence on its origin in water may have constituted one of the sources for Rétif's eclectic cosmological exercise. Pages from La Mettrie on death as an illusion men should not be concerned about, since the atoms we are made of are immortal, or on nature being neither good nor bad, despite our subjective views, echoed within Rétif's text, though the themes were not, by any means, new or original.²⁴

2. AUTHORS AND PUBLISHERS

Instead of attempting to propose my own lineages of influences on Rétif, I would like to call attention to features deserving further investigation, concerning in particular the persistence, represented by Rétif, of mid-eighteenth-century discussions of life and the history of Earth well into the last decade of the century. Before doing so, it is important to briefly allude to some of the personalities making up the immediate circle of interlocutors Rétif boasted about, as well as to the publisher of the *Philosophie*, Nicolas de Bonneville (1760–1828).²⁵ As I hinted at the outset of this essay, placing an author such as Rétif in his context is probably as interesting as, if not more so than, the mapping of the sources that inspired him. The exercise will help to throw light on intellectual trends and traditions considered acceptable, scientifically and politically, within given circles of public figures, authors, and publishers active in the aftermath of the fall of Robespierre in 1794.

There were contemporaries Rétif claimed he wished to have met, but had failed to do so, such as Laplace. He also referred to, among others, Henri Arthaud de Bellevue de la Ferrière (1735–1826), a Lyon landowner from whom he borrowed “an excellent telescope”; Jean-Pierre Antoine, comte de Béhague de Villeneuve (1727–1813), with whom he had conversations on the lovemaking of snakes; and Alexandre-Pierre Julienne de Belair (1747–1819), a then-famous military man whom Rétif characterized as a “savant agronome,” since Belair had published a treatise on agronomy with Rétif's own publisher. After 1785 Rétif was a frequent visitor to the salon of Fanny de Beauharnais (1737–1813), aunt of Josephine, future empress of France.²⁶ In spite of her precarious circumstances, Fanny did her best to help the by then almost indigent Rétif. We also know that Rétif was on good terms with Jacques-Henri Bernardin de Saint-Pierre (1737–1814) and Louis-Sébastien Mercier (1740–1814), who in December 1795 recommended him for a place

²² Rétif first heard of Lucretius between 1753 and 1755; see Coward, *Philosophy of Restif de la Bretonne*, 77. In *La paysanne pervertie ou les dangers de la ville*, 4 vols. (La Haie and Paris: Veuve Duchesne, 1784), 3:103, the name of Lucretius opens the list of Latin poets Ursule should read. On Rétif's claim to be “un autre Lucrece,” see Testud, *Rétif de la Bretonne*, 53; see also 213 and 250.

²³ *Oeuvres philosophiques de La Mettrie*, 3 vols. (Paris: Charles Tutot, 1796), 2:3–48.

²⁴ Coward, *Philosophy of Restif de la Bretonne*, 444–47.

²⁵ P. Le Harivel, *Nicolas de Bonneville, pré-romantique et révolutionnaire, 1760–1828* (Paris: Librairie Istra, 1923).

²⁶ F. K. Turgeon, “Fanny de Beauharnais: Biographical Notes and a Bibliography,” *Modern Philology* 30 (1932): 61–80. For a contemporary testimony of the relationship between Rétif and Fanny de Beauharnais, see M. De Cubières-Palmézeaux, “Notice historique et critique sur la vie et les œuvres de Nicolas-Edme Restif de la Bretonne,” in *Histoire de la Compagnie de Marie*, by N. Rétif de la Bretonne, 3 vols. (Paris: Guillaume, 1811), 1:1–200.

in the literary section of the newly constituted Institut de France, of which they were both members since its inception.²⁷

Several of Rétif's acquaintances also had business with the publisher Bonneville: Mercier, Belair, Bernardin de Saint-Pierre (but also Lamarck, René-Juste Haüy [1743–1822], Laplace) had published works with the Imprimerie du Cercle social, run by Bonneville. Today mostly remembered for his involvement in the early phases of the French Revolution and for the establishment in October 1790 of the club Cercle social with the collaboration of Claude-François Fauchet (1744–93), Bonneville was mainly a translator making money as a printer, though he lacked the gift to stay in business and to make decent profits.²⁸ The interesting point to emphasize is that, whereas the political and editorial activities of the Cercle social are well studied up to 1793, and thanks to Gary Kates we even have a list of authors published by the association up to then, almost nothing is known concerning the later period.²⁹ Because the political relevance of the Cercle was on the wane, or had almost completely disappeared by 1794, few questions have been asked about the varied constituencies it represented and its editorial ventures after that date. Besides the impressive list of authors already mentioned, Bonneville's presses put out the edition of the stenographic transcriptions of the classes held at the École normale de l'an III, the *Journal d'histoire naturelle* edited by Lamarck and colleagues in 1791, and the newspaper *Le bien informé*.

The historiographic silence surrounding *Le bien informé* is surprising, not least in light of the fact that Lamarck published on its pages a series of so-far-unnoticed articles on meteorology.³⁰ This was a rather odd inclusion on the part of the editor of a political weekly, which in my view indicates strong personal links and Bonneville's persistence in seeking accreditation of the Imprimerie du Cercle social as a scientific publisher. Clearly, this was not the "science" we or contemporary members of the Académie could always sympathize with: on the pages of the *Bien informé*, Mercier continued his attacks against Newton and his physics, and Lalande defended his right to be a conservative atheist against the growing witch-hunt directed at self-professed or suspected unbelievers.³¹

In the aftermath of the arrest (May 1796) of François Noël "Gracchus" Babeuf (1760–97), atheists were equated with Jacobin terrorists. As is well known, Sylvain Maréchal (1750–1803), the coeditor, with Lalande, of the *Dictionnaire des athées* (1800), was implicated in Babeuf's plot.

²⁷ Castonguay-Bélanger, *Les écarts de l'imagination*, 147. See also Jacob, *Biographie et iconographie de toutes les ouvrages de Restif de la Bretonne*, 60–61. For the best account of Rétif's circle of friends and acquaintances, see Coward, *Philosophy of Restif de la Bretonne*, chap. 25.

²⁸ N. Ravitch, "The Abbé Fauchet: Romantic Religion during the French Revolution," *Journal of the American Academy of Religion* 42 (1974): 247–62.

²⁹ G. Kates, *The Cercle Social, the Girondins, and the French Revolution* (Princeton, NJ: Princeton University Press, 1985; paperback ed., 2014).

³⁰ See the following issues of *Le bien informé*: 4 vendémiaire an VIII [26 September 1799], 3; 20 vendémiaire an VIII [12 October 1799], 2; 26 vendémiaire an VIII [18 October 1799], 4; 4 brumaire an VIII [26 October 1799], 3; 18 brumaire an VIII [9 November 1799], 3; 21 brumaire an VIII [12 November 1799], 3; 2 frimaire an VIII [23 November 1799], 2; 15 frimaire an VIII [15 December 1799], 3; 29 frimaire an VIII [20 December 1799], 2–3; 13 nivôse an VIII [3 January 1800], 2; 26 nivôse an VIII [16 January 1800], 4; 29 nivôse an VIII [19 January 1800], 3. Lemerle, a navy doctor and president of the Nantes health council, accused Lamarck of plagiarism (*Le bien informé*, 21 frimaire an VIII [12 December 1799], 3), eliciting Lamarck's irate rebuttal (23 frimaire an VIII [14 December 1799], 3).

³¹ J. Evans, "Fraud and Illusion in the Anti-Newtonian Rear Guard: The Coultaud-Mercier Affair and Bertier's Experiments, 1767–1777," *Isis* 87 (1996): 74–107; J. B. Shank, *The Newton Wars and the Beginning of the French Enlightenment* (Chicago: University of Chicago Press, 2008).

The *Dictionnaire* argued that scientists could only be atheists and listed several as prominent unbelievers. Thus, the *Bien informé* was running against the political and intellectual anti-Jacobin tide; General Bonaparte shut down the newspaper early in 1800, in the aftermath of the coup of 18 brumaire an VIII (9 November 1799). Bonneville had accused the general of being a new Cromwell, craftily building up dictatorial power; the (in)famous *Dictionnaire* by Lalande and Maréchal had even dared to list Bonaparte as an atheist. It was soon clear that the First Consul would not tolerate professions of atheism from any quarter, even the highest echelons of contemporary science. Though never quoted by historians of science and of Cuvier, Léonard Aléa, author of a well-argued and almost civil rebuttal of the *Dictionnaire des athées*, stated that at a meeting of the Institut on 15 messidor an VIII (4 July 1800), Cuvier had declared that atheists were either “fous ou fripons” (fools or rascals). Aléa rejected the view that scientists were atheists, certainly not the ones sitting in the prestigious chairs of the Institut.³²

From 1797 to 1802 Tom Paine, the British republican hero, stayed in Bonneville’s flat and contributed to the *Bien informé*.³³ In 1803 Bonneville’s wife and children rejoined the famous political writer in the United States. Paine adopted them as his own family, and thanks to him Benjamin Bonneville (1796–1878), the publisher’s son, started a career in the US Army that was celebrated by Washington Irving in his *Adventures of Captain Bonneville* (1837). If the latter bits of information, juicy as they are, verge on the anecdotal, surely Paine’s activities within the Cercle press are not. We know surprisingly little of the people I have mentioned so far as making up a group of authors active in Paris during the Revolution and its aftermath, though individually some of them have attracted considerable attention, such as Mercier, Rétif, and Paine. Lamarck’s relationship to Bonneville has never been properly investigated or indeed mentioned. The naturalist’s association with the Imprimerie du Cercle social and the *Bien informé* and his fear of serious political consequences due to his collaboration with republican agitators may help explain the silence concerning his theories that Lamarck imposed upon himself after 1802, when he was publicly accused of leaning toward atheism.³⁴

Equally fascinating and puzzling to us is the mixture of works and authors the Cercle printed. As we have seen, Rétif published his *Philosophie* in the same year, 1796, that Laplace’s *Exposition du système du monde* appeared. Whereas Bonneville’s interest in publishing Laplace may seem obvious, the reasons why Laplace accepted to be associated with an (to us) obscure publishing venture are at first sight less so. True, Laplace was still, in 1796, a fervent republican. He was, however, as always, very careful in playing his cards. The choice of the Cercle social as the publisher of his work may in fact indicate that in 1796 Bonneville had managed to establish

³² L. Aléa, *Antidote de l’athéisme, ou examen critique du “Dictionnaire des athées, anciens et modernes”* (Paris: Imprimerie des Instructions Décadaires, September 1800), 156.

³³ On Paine’s contributions to the *Bien informé*, see A. O. Aldridge, “Thomas Paine’s Plan for a Descent on England,” *William and Mary Quarterly* 14 (1957): 74–84; A. Thomson, “Thomas Paine and the United Irishmen,” *Études irlandaises* 16 (1991): 109–19.

³⁴ H. Ferrière, “Bory de Saint-Vincent (1778–1846), naturaliste, voyageur et militaire, entre Révolution et Monarchie de juillet: Essai biographique” (doctoral diss., Université Paris 1, 2006), has documented the worry expressed by one of Bory’s friends that the accusation of atheism leveled against Lamarck could also be addressed to Bory: “toute la prétraille et la bigotinaille, tous canailles, vont vous assommer du poids de leur sainte critique . . . savez-vous que vos opinions sur l’origine du globe sont fondées sur le même principe que celles de M. Lamarck? Et vous n’ignorez pas la réputation de ce dernier sur ce rapport” (154–55). P. Corsi, “Idola Tribus: Lamarck, Politics and Religion in the Early Nineteenth Century,” in *The Theory of Evolution and Its Impact*, ed. A. Fasolo (Milan: Springer Verlag, 2012).

the credibility and to some extent the authority of his brand within republican scientific circles. As far as Bonneville was concerned, he did not see any contradiction in publishing *Philosophie de monsieur Nicolas* alongside Laplace's *Exposition du système du monde*.³⁵ Bonneville's list also included several works by the mystic Louis-Claude de Saint-Martin (1743–1803), a favorite within some intellectual circles of the capital.³⁶ Bonneville had personal sympathy for, and felt attracted to, Saint-Martin. Furthermore, Bonneville had contacts with the Illuminati of Bavaria and British Freemasonry, though he probably never belonged to either confraternity.³⁷ Republican, friend of atheists and scientists, publisher, traveling companion of the Illuminati: the ideal impersonation of the kind of intellectual that had been responsible for the atrocities of the French Revolution, according to the thesis famously elaborated by the Jesuit Augustin Barruel (1741–1820) in his *Mémoires pour servir à l'histoire du Jacobinisme* (1798–99). Barruel quoted Bonneville as the impudent continuator of the nefarious job undertaken by Voltaire and his acolytes.³⁸ Thus, close attention to the social and intellectual milieu Rétif was part of helps to highlight neglected features of the Parisian politics of culture during the last decade of the eighteenth century. Far from being the expression of an isolated, idiosyncratic mind, Rétif's half-digested theories were compatible with the cultural priorities pursued by the group of authors he was part of, opposing trends within academic science they saw as bringing back providentialism and authoritarianism. As Rétif stated at the outset of his *Philosophie*, the cultural and political situation of France had prompted him to publish his views: "Je sens aujourd'hui qu'il est nécessaire de venir au secours de mon pays et de ma nation, en portant le dernier coup au fanatisme, à la superstition de tous les lieux et de tous les temps."³⁹ After 1800, political defeat entailed a *damnatio silentii* we have assumed to be intellectually plausible and philosophically justified.

3. EIGHTEENTH-CENTURY LEGACIES: THEORIES IN REVOLUTION

As suggested at the beginning of this essay, Rétif de la Bretonne is of great interest as a member of a group of writers struggling to make their living at a fair distance from the centers of social and intellectual power. After 1789, they tried to capitalize on the political upheavals and the seeming—albeit temporary—reshuffling of social and cultural hierarchies the Revolution had brought about. Some did so at the risk of their own lives (Bonneville, Mercier) and learned that high politics was a game they could not afford to play. Even before 1789, they were part of the phenomenon brilliantly illustrated by, among others, Roger Chartier and Antoine Lilti: the growing independence of the capital from the court and the monarchic state structure and the remarkable increase in numbers of self-made intellectual operators removed from the world of aristocratic salons and the academies.⁴⁰ They used their pens to survive and, they hoped, to shine in society.

³⁵ For insights into the publishing of the *Philosophie*, and the allegation that Bonneville extensively edited and added to the work, see Jacob, *Biographie et iconographie de toutes les ouvrages de Restif de la Bretonne*, 407–13.

³⁶ To avoid lengthy bibliographical footnotes, see Bibliothèque nationale de France, www.bnf.fr, under the authors quoted; by selecting the "publishers" option in the advanced search function, it is possible to access a listing (which does not appear to be exhaustive) of titles published by the Imprimerie du Cercle social.

³⁷ P.-Y. Beaurepaire, "Le cosmopolitisme des Lumières à l'épreuve: La réunion des étrangers à l'Orient de Paris de la fin de l'ancien régime au Premier Empire," *Revue historique* 300 (1998): 795–823.

³⁸ A. Barruel, *Mémoires pour servir à l'histoire du Jacobinisme*, 2nd ed. (Hamburg: Fauche, 1803), 2:275–301. On Rétif's flirting with the Illuminati, see Coward, *Philosophy of Restif de la Bretonne*, 120.

³⁹ Rétif de la Bretonne, *Philosophie*, 1:2.

⁴⁰ A. Lilti, *The World of Salons: Sociability and Worldliness in Eighteenth-Century Paris* (Oxford: Oxford University Press, 2015); R. Chartier, *The Cultural Origins of the French Revolution* (Durham, NC: Duke University

This was the way to attract private and, increasingly, after 1789, state patronage in the form of academic pensions, positions in the state apparatus, and subsidies reserved to men of letters.⁴¹ It is worth recalling that Robinet, often present in the lists of presumed forerunners of Lamarck and Darwin, was better known in his own time as a continuator of the *Encyclopédie* and as a prolific translator from several European languages. He also edited an unauthorized selection of Voltaire's letters (and was duly reprimanded for this) and the thirty-volume *Dictionnaire universel des sciences morale, économique, politique et diplomatique, ou Bibliothèque de l'homme-d'état et du citoyen* (1777–78). In the late 1770s he was appointed one of the royal censors, a position he held until the Revolution.⁴²

Starting in the 1770s, writing about science, natural curiosities, and voyages became a growing occupation for men of letters and amateurs. Readers appeared to enjoy and consume costly editions of Buffon's works (along with cheaper, often pirated editions) and periodical publications and dictionaries where scientific information was condensed and made accessible at a reasonable price. From the capital to the provinces, private cabinets of natural history proliferated alongside classes in chemistry and pharmacy and demonstrations of the power of electricity. Late in the century, crowds assembled to celebrate the scientific wonder represented by the balloonists, adding to the faith in the progress of knowledge.⁴³ The philosophical, political, and social thrills offered by reading and writing about nature helped the proliferation of publications announcing the most updated and "true" systems of the universe, of Earth, and of life. Yet, thanks to the efforts made by academicians of the caliber of Condorcet and Lavoisier to curb amateur science and the passion for systems of nature, future generations and many historians along with them have assumed that the genre was practiced by marginal men and provincial penmen who had no influence and certainly deserved to be ignored. Thus, we persist in considering Jean-Paul Marat's (1743–93) physics as an oddity belonging to the realm of private intellectual ramblings, of totally irrelevant marginality: Marat's science deserves attention only as an anecdotic appendix to the career of a famous political writer and agitator.⁴⁴

The list of "marginal" self-appointed experts in various branches of natural knowledge is, however, too long to be ignored by historians of French culture and society of the time. Moreover, the assumption that the vast majority of authors offering their views to the public were frustrated

Press, 1991); R. Chartier, *The Order of Books: Readers, Authors, and Libraries in Europe between the 14th and 18th Centuries* (Stanford, CA: Stanford University Press, 1994); D. Roche, *Le siècle des Lumières en province: Académies et académiciens provinciaux, 1689–1789*, 2 vols. (Paris: Mouton, 1978; 2nd ed., Paris: Maison des sciences de l'homme, 1989). For a glimpse at one component of the varied populations of "scientific" practitioners, see the classic study by R. Darnton, *Mesmerism and the End of the Enlightenment in France* (Cambridge, MA: Harvard University Press, 1986).

⁴¹ See J.-L. Chappéy, *La Société des observateurs de l'homme (1799–1804): Des anthropologues au temps de Bonaparte* (Paris: Société des études Robespierriennes, 2002), for a penetrating analysis of the varied populations writing about natural history in the aftermath of the Revolution.

⁴² T. Murphy, "Jean Baptiste René Robinet: The Career of a Man of Letters," *Studies on Voltaire and the Eighteenth Century* 150 (1976): 183–250; J.-C. Bourdin, "Le 'profond sérieux' de Robinet selon Hegel," *Studies on Voltaire and the Eighteenth Century* 302 (1992): 409–37.

⁴³ M. Thébaud-Sorger, *L'aérostation au temps des Lumières* (Rennes: Presses universitaires de Rennes, 2009); J. Perkins, "Creating Chemistry in Provincial France before the Revolution: The Examples of Nancy and Metz; Part I, Nancy," *Ambix* 50 (2003): 145–81, and "Part II, Metz," *Ambix* 51 (2004): 43–75.

⁴⁴ For a rare, nonanachronistic appreciation of Marat's science, see the collection of essays edited by J. Bernard et al., *Marat, homme de science?* (Le Plessis-Robinson: Synthélabo, 1993). Perhaps too uncritical is C. Connor, *Jean Paul Marat: Scientist and Revolutionary* (Atlantic Highlands, NJ: Humanities Press International, 1997).

marginal men is even more partial and anachronistic. The incursions into the theory of electricity and physics by Bernard-Germain-Étienne de La Ville-sur-Ilion, comte de Lacépède (1756–1825), a wealthy aristocrat and prominent courtier, have attracted very little attention, though they showed similarities to Marat’s style of reasoning and of scientific argument. In the vitriolic eulogy to his deceased friend and early patron, Cuvier commented that his colleague’s strange doctrines would have barred the doors of the Académie des sciences to him were it not for his merits as a naturalist and for his continuation of Buffon’s work.⁴⁵ That the leadership of the Académie—albeit not all its members, I hasten to add—had no patience with amateurs pursuing systems of the universe is abundantly clear. Lamarck himself faced a wall of silence when during the 1780s he repeatedly attempted to elicit academic comment for his major (as he thought) work *Recherches sur les principaux faits physiques* (1794). Still, as we will see below, holding views that the powerful academic “geometers” regarded as extravagant did not prevent authors from being considered for admission to the Académie and later to the Institut and from gaining a considerable readership.⁴⁶

The list of authors trying to enlighten the world on the true principles of nature remained long, and for a long time so. Rétif regretted not having read *Physique du monde* (1780) by Étienne-Claude de Marivetz (ca. 1728–94), a wealthy entrepreneur.⁴⁷ Rétif knew well the famous economist Pierre-Samuel Dupont de Nemours’s (1739–1817), *Principes et recherches sur la philosophie de l’univers* (1793) but never mentioned the *Traité de la nature* (1794) by Jean-André Cazalet (1753–1825), a wealthy pharmacist and builder of balloons from Bordeaux. He did not seem to be aware of debates following the publication of *Époques de la nature* by Buffon and certainly ignored the *Histoire naturelle de la France méridionale* (1780–84) by the then-abbé Jean-Louis Soulavie (1752–1813), a naturalist too compromised by the Terror to deserve mention after 1794. Soulavie amassed a fortune as controversial editor of memoirs, most notably those of Louis de Rouvroy, duc de Saint-Simon (1675–1755).⁴⁸ Soulavie would have interested Rétif: he reformulated de Maillet’s and Bonnet’s views on the adaptational capabilities of species faced by geoclimatic change in the hope of establishing a “chronological history of fossil and living animals.” Soulavie argued that ammonites, terebratula, and gryphytes were the prototypes of present-day marine invertebrates. It is appropriate to add that Soulavie was in no way a precursor of Lamarck. He originally combined Buffon’s epochs of Earth with current views of distinct species being capable of

⁴⁵ J.-P. Marat, *Recherches physiques sur le feu* (Paris: Jombert, 1780); J.-P. Marat, *Recherches physiques sur l’électricité* (Paris: Clousier, 1782); B.-G. de Lacépède, *Essai sur l’électricité naturelle et artificielle* (Paris: Didot, 1781); B.-G. de Lacépède, *Physique générale* (Paris: Didot, 1782–84). G. Cuvier, *Recueil des éloges historiques lus dans les séances publiques de l’Institut royale de France* (Paris: Levrault, 1827), 298, commented that Lacépède failed to convince “physicists” of his ideas, which were indeed, he added, “aberrations” that only Buffon could tolerate. See also S. Schmitt, “Lacépède’s Syncretic Contribution to the Debates on Natural History in France around 1800,” *Journal of the History of Biology* 43 (2010): 429–57; J. L. Heilbron, *Electricity in the 17th and 18th Centuries: A Study of Early Modern Physics* (1979; new ed., New York: Dover, 1999).

⁴⁶ Outside academic circles, the issue of establishing hierarchies of reputations and relevance invested the whole of French society at the time; see J.-L. Chappéy, *Ordres et désordres biographiques: Dictionnaires, listes de noms, réputation, des Lumières à Wikipédia* (Paris: Champ Vallon, 2013).

⁴⁷ K. L. Taylor, “Marivetz, Goussier, and Planet Earth: A Late Enlightenment Geo-physical Project,” *Centaurus* 48 (2006): 258–83.

⁴⁸ For recent reevaluations of Soulavie the historian, see A. de Maurepas, “Les méthodes documentaires d’un historien méconnu: L’abbé Soulavie,” *Revue d’histoire moderne et contemporaine* 38 (1991): 626–48; J. Rogister, “Soulavie, Mirabeau et le ministère du duc d’Aiguillon,” *Annuaire-Bulletin de la Société de l’histoire de France*, 2007, 173–98.

considerable levels of adaptation. As he said, ammonites were the “prototypes,” not the ancestors, of living species.⁴⁹

Though Rétif’s *Philosophie* was severely criticized by leading commentators of the time (Louis-Aubin Millin [1759–1818], Pierre-Louis Ginguené [1748–1816], Louis de Fontanes [1757–1821]),⁵⁰ who pointed out the inconsistencies and outright mistakes contained in the book, it would be wrong to assume that the genre the work represented was on the wane. The *Philosophie* was not the last, extravagant testimony of systems of nature that would be abandoned by contemporary sober minds and the new institutional science of the nineteenth century. Works such as the following, to name a few, had little in common at the level of contents, but all shared and continued a tradition of authorial, individual assessment of the overall meaning of contemporary natural knowledge: *De l’énergie de la matière, et de son influence sur le système moral de l’univers* (1801), by Jean-François-Marie Daon; *Théorie physico-mathématique de l’organisation des mondes, ou systèmes planétaires* (1805), by Pierre-François Lancelin;⁵¹ *Théorie nouvelle du flux et reflux de la mer, pour servir d’introduction à la théorie de la terre* (1805), by S. Depaquit; *Essai sur le monde* (1809), by Pierre Hyacinthe Azaïs; *Nouvelle théorie de la vie* (1807), by A. L. Guilletet; *Des révolutions du globe: Conjecture formée d’après les découvertes de Lavoisier, sur la décomposition et la recombinaison de l’eau* (1811), by Charles Gilbert Terray Morel de Vindé; and *De la théorie de l’univers* (1818), by General Jacques Alexandre François Allix de Vaux, comte de Freudenthal (1768–1836). Institutional reactions to the selection of works listed above ranged from silence about social nonentities such as Azaïs, who nevertheless managed to earn his living by giving private classes in universal science; to a polite letter sent back by the Académie to Lancelin, a naval engineer and friend of several leading ideologues; and an embarrassed letter by Jean-Baptiste Delambre (1749–1822) to General Allix, stating that Laplace would not accept anything going against his own views.⁵²

What about the actual doctrines Rétif developed in his *Philosophie*? Was the reference to early and mid-eighteenth-century naturalistic and philosophical literature, to de Maillet and the omnipresent Lucretian tradition, simply the remnant of a literary tradition destined to disappear, victim of the political and cultural reaction to the French Revolution? Was this tradition completely silenced by the new rigorous science of detail promoted in France by Cuvier and his

⁴⁹ L. Aufrère, *Soulevé et son secret: Un conflit entre l’actualisme et le créationnisme* (Paris: Hermann, 1952).

⁵⁰ A.-L. Millin, *Magasin encyclopédique*, 2nd year, vol. 3, an V [1796], 550–56; P.-L. Ginguené, *La décade philosophique*, 10 nivôse an V [30 December 1796], 14–29; L. Fontanes, *Journal littéraire* 3 (1796): 1–17; L. Fontanes, *Le spectateur du Nord* 8 (1798): 284–86. Ginguené and Fontanes had been close to Rétif. Fontanes, a leading figure of the ultraconservative Catholic faction within the empire and the first chancellor of the Imperial University in 1808, had been living in Rétif’s flat.

⁵¹ Lancelin has attracted the attention of historians of philosophy—see, e.g., S. A. Rosenfeld, *A Revolution in Language: The Problem of Signs in Late Eighteenth-Century France* (Stanford, CA: Stanford University Press, 2001)—as well as of famous specialists of the *idéologues* such as Georges Gusdorf and Sergio Moravia.

⁵² P. Bayaud, “Le philosophe Azaïs, inspecteur de la librairie à Nancy (1812–1813),” in *Actes du soixante-quinzième Congrès des sociétés savantes, Nancy, 1950, Comité des travaux historiques et scientifiques* (Paris: Imprimerie nationale, 1951), 29; P.-F. Lancelin, *Théorie physico-mathématique de l’organisation des mondes, ou systèmes planétaires* (Paris: Crapart, 1805), 197–98: the letter to Lancelin was probably written by Laplace, whom the author praised throughout his work. Lancelin believed that planets were the result of explosions of volcanoes in the Sun. “M. Laplace c’est excusé d’examiner une théorie qui lui paroît incompatible avec ses principes”; Jean-Baptiste Delambre to Allix, 22 June 1817, in J. A. F. Allix, *De la théorie de l’univers: Lettres y relatives* (Paris: Plancher, 1819), 24. Allix’s work was translated into German and Italian.

allies? Was Rétif one of the very last eighteenth-century theorizers of processes of change in living nature?

It is appropriate briefly to recall that the reaction to dangerous materialistic doctrines was not the same throughout Europe. In the German states, just to mention a well-studied case, idealistic philosophers, or proponents of *Naturphilosophie*, claimed that the ultimate meaning of scientific investigations was to unveil and reveal the supremacy of the spiritual in all departments of physical, natural, and living phenomena: from the almost blind polarity acting at the molecular level to the highest aspirations of the human soul.⁵³ In France, prominent politicians of science such as Cuvier and Laplace took a different line. They insisted that their work had nothing to do with the highest sphere of moral and philosophical reflection. The science of positive facts was flying near the ground, at a safe distance from the skies of metaphysics and the Highest Truths.⁵⁴ As commissioner of the richly endowed Volta Prize instituted by General Bonaparte in 1802, Laplace went through the scores of memoirs submitted every year, in which the role of electricity as a universal force, responsible for planetary motions as well as for all the phenomena of life, provided material for endless speculation.⁵⁵ Of the authors listed above, Azaïs kept sending his submissions to the Volta Prize, hoping to be rewarded with universal acclaim—and much-needed cash.⁵⁶

Going through the tens of thousands of pages now available on Google Books, one is only slightly surprised to note that explicit reference to *Telliamed* or Diderot, Lucretius, or the great materialist philosophers of the second half of the eighteenth century is rare after the 1790s and usually prominent only in the anti-atheistic or anti-Revolution literature. The 1796 edition of La Mettrie's works was hardly ever mentioned, while the legend of the "fool" doctor and self-proclaimed philosopher having died through dietary excesses was indulged in by critics of materialism and Epicureanism.⁵⁷ Reference even to Diderot's works, many available for the first time thanks to the fifteen-volume edition published in 1798 by Jacques-André Naigeon (1735–1810), was almost nonexistent in the naturalistic and medical literature of the close of the eighteenth century and the early decades of the nineteenth.⁵⁸ True, many of Diderot's books and pamphlets had never been published, and there was a fair amount of confusion as to what exactly had been his role in the publication of the socially subversive *Code de la nature*, the atheistic works of Baron d'Holbach, and the second and third editions of Guillaume Thomas Raynal's (1713–96) *Histoire des Indes*.⁵⁹ However, the threatening presence of Diderot in the thundering denunciations of

⁵³ R. Richards, *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe* (Chicago: University of Chicago Press, 2002).

⁵⁴ N. Dhombres and J. Dhombres, *Naissance d'un nouveau pouvoir: Sciences et savants en France, 1793–1824* (Paris: Payot, 1989).

⁵⁵ S. Deprouw, "Un héritage des Bonaparte: Le prix Volta (1802–1815, 1852–1888)," *Mémoire de Master 1* (Paris: EHESS, 2006).

⁵⁶ Even Azaïs could master high-level social patronage; see M. Baude, "Un protégé de Madame de Staël: Pierre-Hyacinthe Azaïs," *Revue d'histoire littéraire de la France* 66 (1966): 149–52.

⁵⁷ In a biographical entry on La Mettrie, Virey called him, and Diderot, "des Robespierre de la pensée"; see *Dictionnaire de la conversation* 36 (1837): 276. For a substantially moderate comment, calling attention to La Mettrie's doctrine of life, see the review of *Œuvres philosophiques* in *L'esprit des journaux* 1 (January–February 1796): 5–13, 13.

⁵⁸ This impression is open to correction by the work that Caroline Warman is undertaking on the influence exercised by Diderot's concept of physiology in early nineteenth-century France.

⁵⁹ Étienne-Gabriel Morelly (c. 1717–c. 1782), *Code de la nature, ou Le véritable esprit de ses lois de tout temps négligé ou méconnu* (1755); Stéphanie Roza has published a critical edition (Montreuil: Editions la Ville Brûlée, 2011).

the crimes of the Revolution, committed in the name of atheism and materialism, discouraged reference and perhaps even reading. Naturalists and savants in general carefully avoided all association with a past that had declared the progress of knowledge the highest accomplishment of humanity: the consequences of the pride of reason were evident to all eyes. Throughout Europe, precautionary and often programmatic self-censorship was the only measure naturalists could take to rehabilitate scientific endeavors in the eyes of reactionary authorities and of representatives of the equally conservative religious revival. In the light of the violent reaction against scientific pursuits, accused of leading to atheism, it could even be argued that William Paley's *Natural Theology* (1802) was in fact a *defense* of scientific pursuits: when properly pursued by individuals free from ideological and philosophical commitments, natural knowledge inevitably led to the veneration of the all-powerful, providential Creator, never to atheism.

Much of the discourse about the “precursors of Lamarck” (and of evolution) has been built on the difficulties in understanding what exactly went on during the last two decades of the eighteenth century, the 1790s in particular. This is due in part to the systematic effort by key protagonists themselves to deny that the dangerous materialistic trends embodied in the various available systems of nature—as seen from the post-1800 perspective—had ever affected the pursuit of true knowledge. Yet, in his own amateurish and not always fully cogent way, Rétif was right in claiming that Laplace's 1796 *Exposition du système du monde* had conferred legitimacy on the genre, and paradoxically on his own system. A few years later, Lancelin argued that Laplace's *Exposition* had provided sound foundations for modern cosmology.⁶⁰ In commenting on Dupont de Nemours's system, a conservative reviewer (probably Fontanes) stigmatized the proliferation of “systèmes de la nature” and in a veiled critique addressed to Laplace, already an influential politician and soon to become a short-lived minister of the interior, remarked that state officials appeared to be particularly keen in pursuing the subject.⁶¹

Indeed, before the revolutionary storm, the idea that the pursuit of knowledge had to aim at drawing together a vast synthesis, from molecules to man, was shared by a wide spectrum of authors, including—surprisingly, in view of his later recriminations against overarching systems—the young Georges Cuvier.⁶² In a letter to his friend Christoph Heinrich Pfaff, dated 17 November 1788, implicitly expanding upon earlier views expressed by his friend Carl Friedrich Kielmeyer (1765–1844), Cuvier declared:

I think we should carefully investigate the relationship of all existing beings with the whole of nature, mainly in order to show their role in the economy of this vast Everything. In carrying out this work, I wish we could start with the simplest things, with water and air, for instance,

See also *Système de la nature ou des lois du monde physique et du monde moral*, published by d'Holbach in 1770 under the name of Jean-Baptiste de Mirabaud. See also P. Pellerin, “Naigeon: Une certaine image de Diderot sous la Revolution,” *Recherches sur Diderot et sur l'Encyclopédie* 29 (2000): 25–44.

⁶⁰ T. Frangsmuyr et al., eds., *The Quantifying Spirit in the 18th Century* (Berkeley: University of California Press, 1990). Lancelin's philosophical reflections attracted the attention of Stendhal; see J. Alciatore, “Stendhal and Lancelin,” *Modern Philology* 40 (1942): 71–102.

⁶¹ Review of *Philosophie de l'univers*, by Dupont de Nemours, *Journal de littérature* 3 (23 February 1797): 33–45; L. Loty, “Métaphysique et science de la nature: Dupont de Nemours contre la théorie de l'instinct,” in *Nature, Histoire, Société: Essais en hommage à Jacques Roger*, ed. C. Blanckaert et al. (Paris: Klincksieck, 1995), 328–40.

⁶² R. Rey, “La circulation des idées scientifiques entre la France et l'Allemagne: Le cas Cuvier,” in *Allemands and France, Français en Allemagne, 1715–1789*, ed. J. Mondot, J.-M. Valentin, and J. Voss (Sigmaringen: J. Thorbecke Verlag, 1992), 201.

and after having treated of their influence on the whole, we would step-by-step move on to consider minerals that are composed, and from them to plants, and so on; at each step we should establish exactly the level of the composition, or, which is the same, the number of properties this level enjoys above the one that precedes it, establish the necessary effects of these properties, and their usefulness in creation.⁶³

True, Cuvier never referred to his juvenile program in later years, when he came out strongly against *Naturphilosophie* and speculative German natural sciences. Still, during the last decade of the eighteenth century he and Kielmeyer shared theoretical ambitions that were expressed throughout the Continent up to the early phases of the French Revolution. After the worst was over, and Europe was engulfed in almost two decades of French expansionist wars, ambitions had to be toned down or had to find expression in terms that denied any connection with the past. Cuvier poured scorn on eighteenth-century mutationist fantasies and famously equated Lamarck to *Telliamed*, Delamétherie, and even to Johann Christian Rödig (1772–1863), whose *Lebende Natur* (1801), dedicated to First Consul Bonaparte (but only in the copies sent to France), was perfectly congruent with the tradition Rétif had tried to imitate and appropriate. The obscure German author, who published precious little after 1803, praised Lavoisier and his chemistry and proceeded to build his own ladder of combinations and permutations that included copious, albeit-unacknowledged reference to *Telliamed*. Rödig argued that hippopotami led astray into the sea could one day move back to the waters from which they first emerged and become whales.⁶⁴

Rather than decline, if anything the 1780s and the 1790s witnessed an explosion of attempts to provide a coherent explanatory model for all natural phenomena, the organic world in particular. The works of not only the French authors I have already referred to but also Erasmus Darwin, in England, along with the circulation of manuscript copies of Kielmeyer's lectures, prudent as they were, caused considerable anxiety and prompted, among others, Jean-André De Luc (1727–1817) to publish the last of his *Lettres sur l'histoire physique de la terre* to denounce the dangers of views extolling the self-organizing and transforming powers of matter.⁶⁵

If one considers the vagaries of Rétif, Cuvier's fight for "positive" science, and the precautionary antitheoretical strategies put in place by naturalists working in institutions that depended on state support for their survival or were under scrutiny from censorship, it seems as if the eighteenth-century tradition of debates on nature and life had died away by the beginning of the next century. In this deafening silence, it has often been argued, the heroic Lamarck was left alone in

⁶³ L. Marchant, ed., *Lettres de Georges Cuvier à C. H. Pfaff sur l'histoire naturelle, la politique et la littérature, 1788–1792* (Paris: Librairie Victor Masson, 1858), 70–71.

⁶⁴ J. C. Rödig, *Lebende Natur* (Leipzig: Breitkopf and Haertel, 1801). On Cuvier's outbursts against dangerous German and French doctrines, see P. Corsi, "The Revolutions of Evolution: Geoffroy and Lamarck, 1825–1840," *Bulletin du Musée d'anthropologie préhistorique de Monaco* 51 (2011): 97–122; W. Zimmermann, *Evolution: Die Geschichte Ihrer Probleme und Erkenntnisse* (Munich: Karl Alber, 1953).

⁶⁵ J.-A. De Luc, *Lettres sur l'histoire physique de la terre, adressées à M. le Professeur Blumenbach, renfermant de nouvelles preuves géologiques et historiques de la Mission divine de Moysé* (Paris: Nyon, an VI [1798]), letter 7, "Remarques sur l'origine des êtres organisés," 338–403; M. Kölbl-Ebert, ed., *Geology and Religion: A History of Harmony and Hostility* (London: Geological Society, 2009); J. L. Heilbron and R. Sigrist, eds., *Jean-André Deluc, Historian of Earth and Man* (Geneva: Slatkine, 2011). A new American edition of *Telliamed* had been published in Baltimore (W. Pechin, 1797). For effective denunciations of the dangers of unbridled natural investigation made by representatives of the anti-Enlightenment clergy, see, e.g., abbé Balthazard (?–1801), *L'isle des philosophes* (Chartres: Deshayes, 1790); A. Barruel, *Les Helviennes, ou Lettres provinciales philosophiques* (Amsterdam and Paris: Laporte, 1781) (by 1830 *Les Helviennes* had reached seven multivolume editions).

his fight for evolution. Rétif, in his idiosyncratic way, tried but failed to remind contemporaries of the merits of daring, overarching views of nature. But is this a fair account of the transition from the eighteenth to the nineteenth century? Should we not pay more attention to a broader spectrum of publications and authors and perhaps ask questions involving the actual impact of the passing of generations? Indeed, it would be plausible to argue that authors who were over fifty years of age by the year 1800 were perhaps likely to know well what the tradition Rétif represented was about. Younger colleagues, who became adults in the years of the reaction to the Revolution, had probably only a very faint idea of what *Telliamed* was or what Buffon had actually said about organic molecules or the unity of organization. And even if they knew, they strove to keep that knowledge at a safe distance.

4. GENERATIONAL CHANGE: DIFFERENCES AND CONTINUITIES

In this section I will mainly and briefly survey articles that appeared in the *Nouveau dictionnaire d'histoire naturelle* (1803–4), a work I have often called attention to. Mocked by Cuvier, who in 1804 tried to launch his own *Dictionnaire des sciences naturelles* to kill off competition, but failed to do so, the *Nouveau dictionnaire* was an editorial success.⁶⁶ A list of at least 1,600 subscribers to the first edition has survived, and we know that the print run sold out by 1808. A good number of contributors were naturalists surviving thanks to their pens, though a major representative of “official” science, Antoine-Augustin Parmentier (1737–1813), was the main influence behind the venture. The general editorship of the *Nouveau dictionnaire* was confided to Charles-Nicolas-Sigisbert Sonnini de Manoncourt (1751–1821), a former collaborator of Buffon’s and a man with considerable experience in editorial ventures capable of catching the eye (and the money) of fashionable readers. The key “theoretical” articles were confided to Julien-Joseph Virey (1775–1846), a pharmacist protégé of Parmentier’s, then a bookworm in his late twenties who had spent his youth in the Sainte-Geneviève library. Many of his articles were composed or, rather, put together in 1802, and they provide a fascinating insight into the authors and topics Virey was interested in. As we have already seen with reference to Rétif, Virey the omnivorous reader is perhaps more interesting in this context than Virey the theoretician of life, even though commentators have called attention to his pioneering studies of chronobiology.⁶⁷ A second contributor will be worth our attention: the then-well-known traveler to Russia, former collaborator with Peter Simon Pallas (1741–1811), and mineralogist Eugène-Louis-Melchior Patrin (1742–1815), who authored the entries on earth sciences—to employ our contemporary disciplinary definition.

4.1. The Older Generation: Eugène-Louis-Melchior Patrin

Patrin and Virey neatly embody the generational transition I have alluded to. The former proudly justified in 1802 the several decades of research and travels he could boast about. It is not surprising, therefore, that several of his works, and the entries he contributed to the *Nouveau dictionnaire*, put forward doctrines not very different from the ones Rétif had endorsed in his *Philosophie*. In

⁶⁶ The low cost of the volumes was a key factor in their success; see H. R. Yorke, *Letters from France in 1802* (London: Symonds, 1804), 333: “This precious work is published at so reasonable a price, that the sale will scarcely defray the expenses of paper and printing. It is essentially a patriotic undertaking, by Sonnini, Virey, Parmentier, Huzard, Bosc, Olivier, Latreille, Chaptal, Cels, Thouin, Du Tour, and Patrin, men possessed of great knowledge of the subjects of which they treat.”

⁶⁷ A. E. Reinberg et al., “The Birth of Chronobiology: Julien Joseph Virey, 1814,” *Chronobiology International* 18 (2001): 173–86.

the entry “Pluralité des mondes” he argued—without any reference to similar but more moderate theses made popular by authors such as Bernard de Fontenelle (1657–1757) or even to those expressed in the fiction of Cyrano de Bergerac—that the moon and all the planets, but also the sun and stars, were inhabited by organisms adapted to each environment.⁶⁸ In a long article on veins of metal (“Filons”), a kind of essay-review of theories put forward in the last hundred years and recently by Abraham Gottlob Werner (1749–1817), Patrin defended his view that Earth was an organism.⁶⁹ Thus, mineral veins could be compared to tooth decay; volcanoes were phenomena linked to problems of the circulation of fluids and chemicals inside the mass of the planet; the atmosphere and the seas were equally agitated by the movement of fluids. The source of his inspiration, he pointed out, was not literary or philosophical. Patrin referred with admiration to the work of the well-known German mineralogist Johann Gottlob Lehmann (1719–67) on the origin of mineral veins. As he put it in terms not dissimilar to the ones employed by Retif:

Planetary bodies (such as Earth) are not inert masses: nature creates nothing that is dead. These big bodies enjoy a kind of organization of their own; it is not the organization of an *animal* or of a *plant*, it is the organization of a *world*; they perform functions analogous to their destination; the principle that regulates these functions is in its turn analogous to the one that renders all organized beings alive. Nature does not proceed in two different ways; all organized beings are animated by a circulation of fluids; these fluids are modified following different combinations, according to the organs producing them; the same happens in the terrestrial globe.⁷⁰

Contrary to Rétif, Patrin showed great knowledge of the mineralogical literature and quoted from authors active throughout Europe. He was particularly happy to draw attention to those who had praised him, to denounce those who had plagiarized him, and to respectfully disagree with Werner, who did not like the hylozoism he and Lehmann defended. Patrin was also attentive to the progress of experimental and theoretical chemistry. He fully supported the new chemistry of Lavoisier (fiercely opposed by his friend Delamétherie) and repeatedly referred to memoirs and treatises by Antoine-François Fourcroy (1755–1809) and his school. Oxygen, hydrogen, acids, and explosive combinations of elements were key active powers in the life of the Earth-organism.

Mastery of the European literature on mineralogy and the adoption of the new chemistry were not sufficient to spare Patrin the sarcasm of Cuvier, who repeatedly ridiculed the writings of his colleague.⁷¹ It would be wrong, however, to conclude that Patrin’s (to us) odd ideas isolated him from the scientific culture of his time. Even Cuvier could do nothing to prevent Patrin from being appointed librarian to the École des mines, following the donation of his rich library to the institution, or to stop the mineralogist from coming very close to being admitted to the Institut

⁶⁸ E.-L.-M. Patrin, “Pluralité des mondes,” in *Nouveau dictionnaire d’histoire naturelle* (hereafter abbreviated NDHN), vol. 18 (1803), 152–53; “Filons,” in NDHN, vol. 8 (1803), 452–82, esp. 476, 477; “Volcans,” in NDHN, vol. 23 (1804), 395–455, esp. 444.

⁶⁹ A. G. Werner, *Nouvelle théorie des filons* (Freiberg: Craz, 1802), now in paperback (Charleston, NC: Nabu Press, 2011).

⁷⁰ Patrin, “Volcans,” 429. Not surprisingly, Patrin believed that throughout the history of Earth, forms of life originally generated in water adapted to the changing environmental circumstances; see P. Corsi, *The Age of Lamarck: Evolutionary Theories in France, 1790–1830* (Berkeley: University of California Press, 1988), 82–83.

⁷¹ See, e.g., G. Cuvier, “Notice des travaux de la classe de sciences mathématiques et physiques de l’Institut national, pendant le deuxième trimestre de l’an 8: Lue à la séance publique du 15 germinal, par Georges Cuvier, secrétaire,” *Magasin encyclopédique*, VI année, vol. 1 (an VIII [1800]), 90–92, esp. 91.

in 1802.⁷² Patrin was respected for his exploration of Siberia with Pallas and for his deep knowledge of mineralogy and of geological phenomena, and by buying his works, cultivated readers, and naturalists with them, tangibly acknowledged Patrin's right to his own theories. A frequent contributor to the *Journal de physique* and author of a successful handbook of mineralogy, Patrin was not a marginal man, simply drawing upon doctrines and a style of arguing in science that belonged to the eighteenth century.⁷³ He was indeed, and fully so, a man of the century that had ended in tragedy. Yet, he proved remarkably apt in following new trends in science and reporting on them to a wide audience, while preserving and promoting his own seemingly outmoded pet doctrines. In this, he was not alone. It is appropriate to briefly consider Philippe Bertrand (1730–1811), another representative of the “old” generation. In his *Nouveaux principes de géologie* (1797) Bertrand, a friend of Patrin's and Delamétherie's and a respected mining engineer, canal builder, and geologist, criticized Rétif's work but acknowledged that it contained much to be taken into serious consideration. He also praised *Telliamed*, for him still a source of inspiration. With de Maillet, Bertrand argued that all organic forms originated in the primeval ocean and slowly adapted to terrestrial and aerial life; the animals and plants that perished in the process by far exceeded in number the forms living today. Bertrand was not hostile to the new science promoted by the “geometers” at the Académie. He paid homage to Laplace's remarkable *Exposition du système du monde* but pointed out that the work limited itself to safely stating what observation and strict astronomical knowledge authorized. There was a much wider field open to speculation guided by analogy: a vast, fascinating domain he, Rétif, and his friend-rival Delamétherie were prepared to explore. Lamarck expressed similar views on the relationship between reasoning and facts when in *Réfutation de la théorie pneumatique* (1796) he defiantly declared that he had not engaged in a single experiment, since there were matters in science that required philosophical alertness and sophisticated reasoning.⁷⁴

The idea of a sharp break between the eighteenth and nineteenth centuries can be entertained only by ignoring the complex geography of late eighteenth-century intellectual allegiances and hierarchies, the multiplicity of assumptions about what constituted proper “science,” and the many compromises between the old and the new that authors and publishers were prepared to engage in.

4.2. The Younger Generation: Julien-Joseph Virey

Patrin was convinced that matter was capable of organizing itself through processes of attraction, producing organic molecules and finally living beings. He vigorously denied that such views were atheistic. He often paid homage to the “Infinite Wisdom” ordering the system of the universe

⁷² “Institut national,” *Le moniteur universel*, no. 132 (12 pluviôse an X [1 February 1802]), reported on the meeting held on 1 pluviôse (21 January), in which members voted on five candidates to the succession of Déodat Gratet de Dolomieu (1750–1801). The politically well-connected Louis Ramond de Carbonnières (1755–1827) was elected with 181 votes, just making it against Patrin, who obtained 175 votes. Jacques-Christophe Valmont de Bomare (1731–1807) followed with 131; Antoine Marie Lefebvre d'Hellancourt (1759–1813), 105; and François Pierre Nicolas Gillet de Laumont (1747–1834), 105.

⁷³ E.-M.-L. Patrin, “Recherche sur les volcans d'après les principes de la chimie pneumatique,” *Journal de physique* 7, no. 50 (germinal an VIII [1800]): 241–67; E.-M.-L. Patrin, *Histoire naturelle des minéraux*, 5 vols. (Paris: Deterville, 1802).

⁷⁴ Phillippe Bertrand, *Nouveaux principes de géologie, comparés et opposés à ceux des philosophes anciens et modernes, notamment de J.-C. Lamétherie* (Paris: Maradan, 1797), 521–38, 329; Coward, *Philosophy of Restif de la Bretonne*, 199. Like Rétif, Bertrand believed that suns and planets were endowed with a sort of life of their own (527, 524–25).

and the properties of matter and strongly denied that natural knowledge led to the rejection of the providential role of God in nature. Professions of faith were common features shared by all contributors to the *Nouveau dictionnaire*. Virey's dealings with sensitive entries such as "Vie," "Nature," "Génération," "Homme," and "Corps organisés" were equally marked by devout reference to the Deity and occasional outbursts against atheists. Throughout his immensely productive life, Virey fought on behalf of vitalist and antimaterialistic principles and showed little patience with Epicureans and whoever argued in favor of the capacity of natural forces to self-regulate to produce all the complex phenomena we see and study.⁷⁵ At a fine level of analysis, it is clear that Virey and Patrin disagreed on substantial metaphysical and theological points, but this did not prevent collaboration and exchange of civilities.

Unlike Rétif, Virey appeared to be familiar with an impressive array of sources; like Rétif, he rarely acknowledged them in full. True, he liked to boast his awareness of German and English works, and several of his entries read like, and were intended to be, literature reviews on a given topic. Yet, philological diligence rarely extended to the treatment of key doctrines he expanded upon in some detail. In this latter case, tracking down Virey's sources is as nightmarish as tracking down the sources used by La Mettrie and, even more so, by des Bureaux and Rétif.

In the hundreds of pages he contributed to the first edition of the *Nouveau dictionnaire*, Virey rarely quoted Lucretius (and not always correctly) or Maupertuis and referred to *Telliamed* only to quote one instance of dwarfs whom de Maillet had seen in Egypt.⁷⁶ Nevertheless, implicit and detailed reference to all the above is frequent throughout key entries, as a few instances will prove. In the second edition of the *Nouveau dictionnaire* (1816–19), *Telliamed* and Lucretius were explicitly singled out as dangerous representatives of the materialist Epicureanism Lamarck had recently revived.⁷⁷ Since Virey clearly already knew their works in 1802, it is legitimate to conjecture that at the time he exercised a sort of precautionary self-censorship, by carefully avoiding any association with sulfurous authors. At the same time, their doctrines, interspersed with devout homage to the providential Creator, played a key role in the most important theoretical entries of the *Nouveau dictionnaire*.

Of the many passages illustrating Virey's discursive practices and contortions, I will briefly sum up a long passage from the lengthy and flowery "Discours préliminaire" in volume 1 of the *Nouveau dictionnaire*, dealing with the "marche de la Nature" and the epochs that succeeded each other in the history of Earth. Echoing Buffon, but also Robinet, Lucretius, Bonnet, and *Telliamed*, Virey offered his own version of several doctrines put forward or circulating widely during the eighteenth century, and late in the century in particular.

Living nature, according to Virey, proceeded from the simple to the complex. Simple organisms such as mushrooms or polyps, partly vegetable and partly animal, had been the first to appear: "They represent nature's hesitation, so to speak, its trial in organization; there is much indicating that they were the first to be produced, at the beginning of ages, when Earth, fertilized by the hands of its Creator, started to develop the germs of life in conditions of humidity and heat."⁷⁸ The first epoch lasted for numberless ages, as attested by the immense remains of marine

⁷⁵ P. Corsi, "Julien-Joseph Virey, le premier critique de Lamarck," in *Histoire du concept d'espèce dans les sciences de la vie*, ed. S. Atran (Paris: Fondation Singer Polignac, 1987), 176–87.

⁷⁶ "Nain," in *NDHN*, vol. 14 (1803), 154.

⁷⁷ See, e.g., J.-J. Virey, "Habitation et station," in *NDHN*, vol. 14 (1817), 108–28, esp. 126–27.

⁷⁸ J.-J. Virey, "Discours préliminaire," in *NDHN*, vol. 1 (1803), xxiii.

shells making up entire mountain formations. Life developed mainly in the waters and in the border areas between the sea and the few emerged lands. During the second epoch, marine invertebrates learned to live on dry land, as did several vegetable forms; they colonized the expanding territories abandoned by the retreating seas. A third epoch saw the diffusion of more complex animal and vegetable forms: “At this time, Earth started to be covered with herbs and to adorn itself, for the first time, with greenery; the sexes separated in animals, organs were multiplied and rendered more defined; glimmers of instinct started to emerge, as the divine hand bestowed more riches on animated matter.”⁷⁹ A fourth epoch saw the appearance of large quadrupeds; finally, the fifth epoch witnessed the arrival of man.

The levels of organic complexity reached in each epoch remained embodied in the divisions we can trace today in our classifications: “Every class declares the epoch of its creation and represents the age of living nature”; “zoophytes and polyyps represent the infancy of living nature, man its puberty.”⁸⁰ No one knew whether the white man, today’s master of Nature, was one day destined to be superseded by a superior form, as the white man had ousted the black man, who in turn had taken over from the families of monkeys. The whole process, Virey assured his readers, was in the hand of Divine Providence, who had guided the entire “evolution.”⁸¹

Virey offered readers sanitized versions of doctrines that antimaterialist and anti-atheist commentators had singled out for severe censure. In some cases, he simply alluded to such doctrines, without entering into any meaningful detail. This was the case when he reviewed theories of generation, providing a sort of guide to the literature on preformism and epigenesis, siding explicitly against preformism. Virey touched briefly upon Maupertuis’s atomistic and materialist interpretation of the formation of embryos as the assembly of particles through attraction; he also discussed, among others, Buffon’s view that each part of the body sent to the reproductive system organic molecules, which were then assembled to generate new individuals. He did, however, abstain from commenting or discussing the consequences to be drawn from such views.⁸² Virey even introduced a theme, belonging to the atomistic tradition, that he would insist upon throughout his career, that death does not exist, since all the living molecules we are made of will simply reassemble elsewhere, in a new organism: “The brilliant flower is nourished by nutritional molecules received from an infected corpse buried at its roots. Organs are composed of the debris of other organs.”⁸³

Lucretius, La Mettrie, and Rétif would have agreed. To Virey, generation was due to a particular kind of attraction exercised by the universal principle of love: “The generative faculty is a general phenomenon throughout the universe; within raw substances, it is represented by planetary and chemical attractions; within organized bodies, by love.”⁸⁴

The detailed discussion he devoted to explaining how living organisms left the primeval waters where they originated and adapted to terrestrial life clearly—albeit freely—drew on *Telliamed* and Lucretius, though without reference to their works. Virey explained that the waters of the primeval ocean probably contained more organisms than today’s earth and atmosphere put

⁷⁹ Ibid.

⁸⁰ Ibid., xxiv.

⁸¹ Corsi, *Age of Lamarck*, 172–73.

⁸² J.-J. Virey, “Génération,” in *NDHN*, vol. 9 (1803), 342–43.

⁸³ Ibid., 313.

⁸⁴ Ibid., 315.

together: “It is from the seas’ fertile bosom that all the races inhabiting the world have emerged; the aquatic families appear to have been the parents of terrestrial and aerial species. From the depth of the ocean’s abyss, where Nature, in silence and through time, creates numberless multitudes of seeds, have come the swarms of living beings that, after having filled the solitude of the seas, gradually adapted to live on land.”⁸⁵ Once again, eighteenth-century authors ranging from La Mettrie to Rétif would have found the description of so momentous a process perfectly acceptable, though they would not have resisted the temptation to add their own variations on the theme.

More original and detailed was Virey’s rendering of the famous hypothesis put forward, and rejected, by Buffon and accepted by Diderot and Rétif. As we have seen, this concerned the possibility of seeing in the vast web of analogies linking all plants and animals the genealogical relationship to a single prototype for each major kingdom: “All animals, all plants, are nothing else than the modifications of an original animal, of an original vegetable.” “Nature has first produced a very simple animal and a very simple plant, which it has modified in infinite ways and gradually rendered more complex, up to the level of the most perfect species.”⁸⁶ Echoing again eighteenth-century themes, Virey explained that each organism was endowed with a “vital gravitation” pushing it up the ladder of complexity and perfection.⁸⁷ In the entry “Corps organisés” he added the rather original view that varieties, when subjected for a long period of time to the same set of circumstances (climatic, alimentary) that produced them, were destined to become true species: “It follows from this principle that all our families are in fact the very primitive species, the varieties of which, through a very long but well-defined time, have become constant species.”⁸⁸

Virey’s view of varieties as incipient species did however contradict the essentialist doctrine of species he developed in other entries. Variations were there defined as oscillations from the mean that constituted the eternal essence of the species.⁸⁹ The *Nouveau dictionnaire* was put together in haste, leaving little time for revision and adjustments. Moreover, and more important, coherence was not the prominent goal of an encyclopedic collection. The main function of a dictionary was to entertain readers and inform them about a broad spectrum of “views” of nature. The success of the first and second editions of the *Nouveau dictionnaire*, and of many dictionaries of the first half of the nineteenth century, was in great part due to their capacity to deal with issues that authoritative representatives of academic science refused to approach.⁹⁰ Virey was an omnivorous reader writing for readers interested in science and its bearing on our understanding of nature and its processes. Dictionaries and periodicals, amateur systems of nature and of life, continued to survive and at times to make a profit because they provided answers to questions academic or “respectable” science preferred to ignore.

⁸⁵ J.-J. Virey, “Poissons,” in *NDHN*, vol. 18 (1803), 217–18.

⁸⁶ J.-J. Virey, “Nature,” in *NDHN*, vol. 15 (1803), 383.

⁸⁷ *Ibid.*, 380.

⁸⁸ J.-J. Virey, “Corps organisés,” in *NDHN*, vol. 6 (1803), 267. In France, the view that varieties were incipient species was often discussed in popular dictionaries throughout the first half of the nineteenth century; see Corsi, “Revolutions of Evolution.”

⁸⁹ J.-J. Virey, “Espèce,” in *NDHN*, vol. 8 (1803), 102.

⁹⁰ For a survey of early nineteenth-century dictionaries and their indulgence in “unsafe” doctrines, see Corsi, “Revolutions of Evolution.”

With hindsight, it could be argued that the presence of doctrines seemingly in contradiction with each other in the *Nouveau dictionnaire* and in Virey's own rich literary production constituted an added value, not a defect. One point nevertheless remained consistent throughout Virey's outside literary production: the belief in the Deity and in Providence and opposition to whatever doctrine explicitly or implicitly denied these superior truths. Once his pious intentions were made explicit, he accepted every combination of natural views as worthy of discussion—even the ones denounced by commentators as being at the root of the attacks on religion that had opened the way to the Revolution. Virey, and several of his colleagues, were largely responsible for the continuation of eighteenth-century debates well into the early decades of the next century, to the point that contemporary critics felt the French naturalist had been too ecumenical and too tolerant toward dangerous doctrines that de facto excluded God from the workings of nature. Embarrassed by this accusation, Virey responded in a footnote in the *Nouveau dictionnaire* that the allegations of Spinozism leveled against him were unfounded.⁹¹ In the contemporary political climate, Catholic and conservative authors often quoted Spinoza alongside Lalande and other infamous materialists and atheists to denounce the crimes of philosophy against religion and public safety.⁹² Despite this early rebuke, up until his death Virey managed to preserve the (controversial) image of a pious naturalist, the guardian of a providential view of nature that too many of his French colleagues had given up. Still, as late as 1836 the Ultramontanist Nicholas Wiseman (1802–65), the future cardinal, living in Rome and himself an omnivorous reader, singled out Virey as one of the most dangerous contemporary naturalists. His expressions of devotion were hiding far more sinister intentions and doctrines, such as polygenism.⁹³

5. CONCLUSIONS: INTO THE NINETEENTH CENTURY

Virey and Patrin, and the editorial enterprises they contributed to, can be considered important witnesses of the survival of unsavory eighteenth-century doctrines into the nineteenth century. As posited at the outset of this essay, des Bureaux and Rétif were not giving voice, each at the level of competence and sophistication he could muster, to dying or almost irrelevant views of nature, nor were they, needless to say, anticipating future theoretical developments. They spoke a language that the vast majority of their cultivated contemporaries understood, appreciated, or detested all too well. The religious and political reaction against dangerous features of eighteenth-century culture, and the attempt by academic science to dissociate itself from them, were not an obstacle, as we have seen above, to the continuation of the genre “système de la nature” nor indeed to the discussion of topics that academic or respectable science ignored.

Around 1800, Virey was not the only “young” naturalist to find the issues he was detailing in his *Nouveau dictionnaire* entries worthy of careful consideration. In his 1804 *Voyage dans les quatre principales îles des mers d'Afrique*, Jean-Baptiste Bory de Saint-Vincent (1778–1846) printed a chapter outlining a history of Earth and of life, a history that Virey probably disagreed with

⁹¹ Virey was aware of the seriousness of the charge: “L'on accuse souvent une personne de matérialisme, sans se donner la peine de le prouver: rien de plus facile pour la perdre dans l'esprit de beaucoup de gens qui ne lisent pas, et qui croient sur parole” (Virey, “Nature,” 377).

⁹² See, e.g., *Le guide de l'histoire à l'usage de la jeunesse*, vol. 1 (Paris: Bidault, 1803), 391.

⁹³ According to N. Wiseman, *Twelve Lectures on the Connection between Science and Revealed Religion*, 2 vols. (London: Joseph Booker, 1836), 1:182, “his works are even more revolting” than those of Voltaire, Antoine Desmoulins and Bory de Saint-Vincent.” Wiseman's *Lectures* went through several editions, where the passages devoted to Virey remained unchanged.

for its lack of any reference to Providence but nevertheless found interesting enough to quote in his later works. Bory, an admirer of Buffon's, spent several years trying to observe how "living" or "active matter," one the five basic forms matter took, combined with "green matter" to give rise to elementary organisms destined to develop into zoophytes, before ascending the ladder of complexity up to the level of man. To him, the fauna and flora of archipelagoes lost in the seas presented peculiar features because "local" forms of matter specific to the location combined to form equally specific living organisms. Life generated wherever conditions made it possible, and it ascended the ladder of organic complexity conditioned by the material characteristics that had originated it.⁹⁴

Several successful nineteenth-century dictionaries that enjoyed a wide and international readership, including Bory's own *Dictionnaire classique d'histoire naturelle* (17 vols., 1822–31), contributed to the preservation of basic tenets of eighteenth-century natural philosophy, though reference to the authors mentioned in this essay tended to fade away. Amie Bouée (1794–1881), the first president of the Société géologique de France, published in 1834 his yearly address, in which he referred to the primordial generative exuberance of Earth, which could have spontaneously produced even organisms of considerable size. The Lucretian theme of the fecundity of the primitive mud was combined with themes taken from *Telliamed* and the tradition of successive interpretations sketched above. Bouée also discussed in detail doctrines recently put forward by Geoffroy Saint-Hilaire and referred with favor to Lamarck.⁹⁵ Bouée was by no means a marginal naturalist. A true European, he was well known in Edinburgh, where he resided for several years, and was at home in the scientific circles of Austria, Germany, France, and Italy.

In 1831, in England, the novelist and wealthy amateur Thomas Hope (1769–1831) privately printed his three volumes *Essay on the Origin and Prospects of Man*. In it, he referred to the capacity that the material components of different localities had to directly produce the embryos of different races of man, and he quoted French polygenists, including Bory, with approval. In a Lucretian vein, Hope noted that many spontaneously generated races of man perished because of their imperfections.⁹⁶ Finally, as late as 1845 Sir Richard Vyvyan's *On the Harmony of the Comprehensible World* repeatedly referred to Virey's *Nouveau dictionnaire*, to French theoreticians of the changes life could undergo, Lamarck in particular, and also to German authors (in French translation) who could be made compatible with a view of living nature as subjected to cosmic and geophysical transforming influences. He wrote, once again in terms that representatives of the tradition outlined above would have found congenial: "The substance of living bodies was originally contained in water, as primitive organic matter endowed with the quality of assuming organic forms; that it had given birth to very simple organic bodies, varied by circumstances; and

⁹⁴ J.-B. Bory de Saint-Vincent, *Voyage dans les quatre principales îles des mers d'Afrique*, 4 vols. (Paris: F. Buisson, 1804), vol. 3, chap. 22, 123–71. Contemporaries such as Jean-Baptiste Fray (1764–1835), Jean François Gavoty de Berthe, and Nicolas Toulouzan (1781–1840) also endorsed spontaneous generation and the "local" production of organisms. See Fray, *Essai sur l'origine des corps organisé et inorganisés, et sur quelques phénomènes de physiologie animale et végétale* (1808; Paris: Mme Ve Courcier, 1817); Gavoty de Berthe and Toulouzan, *Essai sur l'histoire de la nature*, 3 vols. (Paris: Bertrand, 1815).

⁹⁵ A. Bouée, "Résumé des progrès des sciences géologiques pendant l'année 1833," *Bulletin de la Société géologique de France* 5 (1834): 1–530, esp. 113–19. Bouée protested against the "éternelles récriminations de matérialisme et de désordre dont on cherche à effrayer sans cesse les scrutateurs de la nature" (118).

⁹⁶ T. Hope, *Essay on the Origin and Prospects of Man*, 3 vols. (London: John Murray, 1831), 2:388–90. On page 384 Hope explained how in later ages the capacity for spontaneously generating embryos—human, animal, and vegetable—had ceased, to be replaced by reproduction through generation.

that these bodies have passed successively into more complicated forms, until, in consequence of the development of generative organs, and manifestations of other active functions, they were enabled to keep up the specific succession, by the faculty of generation."⁹⁷

Needless to say, Hope, Vyvyan, and works such as Chambers's *Vestiges of the Natural History of Creation* were also giving voice to more varied, more recent, and not necessarily French cosmological or biological traditions.⁹⁸ Still, they attested to the permanence of the interest in broad-ranging cosmogonies, despite all opposition and scorn, and the continuous fascination with themes and views elaborated during the eighteenth century in France and elsewhere in Europe. Future research on parallel debates taking place in Germany or Italy will help to explain similar continuities and changes throughout the Continent. I hope I have convincingly argued that the intellectual and political standpoints I have highlighted will prevent our taking silence for absence and will assist in making sense of the permanence of the broad "evolutionary" views of the universe that were at the basis of the popular success enjoyed by Charles Darwin and Ernst Haeckel during the second half of the nineteenth century. [A]

⁹⁷ R. Vyvyan, *On the Harmony of the Comprehensible World* (London, 1845), ccliii, cclxvii.

⁹⁸ J. A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (Chicago: University of Chicago Press, 2003).