UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

SPECIES TRANSFORMATION AND SOCIAL REFORM: THE ROLE OF THE WILL IN JEAN-BAPTISTE LAMARCK'S TRANSFORMIST THEORY

A THESIS

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

Degree of

MASTER OF ARTS IN HISTORY OF SCIENCE, TECHNOLOGY, AND MEDICINE

By

CAMILLE TESTA

Norman, Oklahoma

2021

SPECIES TRANSFORMATION AND SOCIAL REFORM: THE ROLE OF THE WILL IN JEAN-BAPTISTE LAMARCK'S TRANSFORMIST THEORY

A THESIS APPROVED FOR THE DEPARTMENT OF HISTORY OF SCIENCE

BY THE COMMITTEE CONSISTING OF

Dr. Piers J. Hale, Chair

Dr. Jennifer Davis

Dr. Peter Soppelsa

Abstract

Jean-Baptiste Lamarck is well known as a pre-Darwinian proponent of evolution; however, comparatively little has been published on his views of human physiology and development. This paper argues that the will was of particular importance in Lamarck's social commentary, and contextualizes his ideas in light of prevailing debates in France about the physiology of mind and morals and the future development of the French nation. The paper first examines popular misconceptions of Lamarck's ideas about the role of the will in evolution, particularly those perpetrated by Georges Cuvier and Charles Lyell; then it analyzes Lamarck's genuine argument that human physiology could be altered by manipulation of a person's habits and milieu. This belief led him to treat natural transformation and social change as complementary forces, and the will was the linchpin in this linkage. Finally, the paper suggests that Lamarck's theories about the role of voluntary action in evolution should be understood in the context of French national concerns about degeneration, social reform, and human perfectibility, which remained part of the French intellectual landscape throughout Lamarck's life and career.

Contents

Introduction

Where historians have paid attention to the French naturalist Jean-Baptiste Lamarck (1744–1829) it has generally been to note his 'transformist' or evolutionary views. However, given that the study of the history of evolutionary ideas has focused largely, and perhaps disproportionately, upon the life and works of Charles Darwin (1809–1882), it will perhaps come as no surprise that the majority of scholars who have written about Lamarck have done so more in order to contextualize Darwin than to consider Lamarck in his own right. One result of this has been that the ideas that have been termed 'Lamarckism' or 'Lamarckian' have been framed in relation to those mechanisms of evolution that scholars have, at various times, wanted to identify as 'Darwinian.' Thus, while the mechanism of natural selection has been claimed as fundamentally 'Darwinian,' the mechanism of the inheritance of acquired characters has been defined as 'Lamarckian,' despite the fact that Darwin appealed to both mechanisms in his explanation of the formation of new species. It is significant that this distinction between what was properly 'Darwinian' and what was 'Lamarckian' was originally drawn in the 1960s, when biologists were concerned to highlight Darwin's contribution to, and agreement with, how they then understood evolutionary biology.[1] Those aspects of Darwin's theory that were deemed to have been correct were identified as 'Darwinian,' while ideas that were not then in vogue in

---

[1] Peter J. Bowler, *The Non-Darwinian Revolution: Reinterpreting a Historical Myth* (Baltimore: Johns Hopkins University Press, 1988), pp.1–2; See also Robert J. Richards's critique of Bowler's 'non-Darwnian' thesis, but agreement on the ideological function of defining 'Darwinism,' in his *The Meaning of Evolution: The Morphological Construction and Ideological Reconstruction of Darwin's Theory* (Chicago: University of Chicago Press, 1992), p.147. For more recent critique on this see Piers J. Hale, 'Rejecting the Myth of the Non-Darwinian Revolution,' *Victorian Review*, 41, 2, (Fall 2015): 13–18.

biology were designated ‘Lamarckian,’ as if they had played no real role in Darwin’s thinking.[2] Indeed, this is still how Lamarckian evolution is presented in a number of current biology textbooks.[3]

So much for historians’ categories. To Darwin and his contemporaries, Lamarck and ‘Lamarckism’ were associated with something quite different. Indeed, in the 1844 letter to his friend and colleague, the botanist Joseph Dalton Hooker, in which he first confessed his belief in transformism, Darwin made it quite clear where he stood *vis a vis* the Frenchman:

> “Heaven forfend me from Lamarck [sic] nonsense of a ‘tendency to progression’ ‘adaptations from the slow willing of animals’ &c,—but the conclusions I am led to are not widely different from his—though the means of change are wholly so.”[4]

Thus, for Darwin and clearly for Hooker too, Lamarck was associated not so much with the inheritance of acquired characters as with ideas of an inherent progressive development and organisms willing their own evolution. Further, and although Darwin does not mention this in his letter to Hooker, as Adrian Desmond has pointed out, Lamarckism was also associated with radical and Francophile revolutionary politics, and thus Darwin had reason beyond a claim to

---

[2] This is in contrast to much of the literature on Lamarck from the early twentieth century, a time when biologists and historians embraced the argument that evolutionary theory required aspects beyond the mechanisms then considered ‘Darwinian.’ Many of these scholars were proponents of an expanded, ‘Neo-Lamarckian’ version of Lamarck’s arguments, or at least attested to the increased popularity of Lamarckism and Neo-Lamarckism during this period, particularly in the US. For example, see Alpheus Spring Packard, *Lamarck, the Founder of Evolution: His Life and Work* (New York: Longmans, Green, & Co., 1901), pp. 332–367; Marcel Landrieu, *Lamarck, le fondateur du transformisme: sa vie, son œuvre* (Paris: Société Zoologique de France, 1909); William Morton Wheeler & Thomas Barbour, eds., *The Lamarck Manuscripts at Harvard* (Cambridge, M.A: Harvard University Press, 1933), “Introduction,” pp. xiii–xxxi; Erik Nordenskiöld, *The History of Biology: A Survey* (New York: Tudor Publishing Company, 1936, “Lamarck,”) pp. 316–330; and Louis Trenchard More, *The Dogma of Evolution* (Princeton, N.J.: Princeton University Press, 1925, “Lamarck,”) pp. 163–184.

[3] For example, see Mary Ann Clark et. al., *Biology 2e* OpenStax, (2018), p. 492.

[4] Charles Darwin to Joseph Dalton Hooker, [11 January 1844], Frederick Burkhardt et al. (eds.), *The Correspondence of Charles Darwin*, Volume 3 (Cambridge: Cambridge University Press, 1987), pp. 1–3.

originality to want to put some distance between his own ideas and those of Lamarck.[5] Among Darwin scholars, therefore, Lamarck has too often been seen as merely one of Darwin's forerunners; insofar as he explicated an early version of evolutionary theory,[6] he was on the right track, but was led astray by his speculations. In the process, though, he did at least smooth the way somewhat for the greater man to come.[7]

In this essay, however, I want to consider Lamarck in his own right and in his own context, rather than in Darwin's. In this endeavor I draw from a different scholarly literature, which includes those comparatively few scholars who have made Lamarck their focus. Goulven Laurent and Pietro Corsi, for instance, have each made valuable contributions and correctives to the literature on pre-Darwinian transformism and to our understanding of Lamarck's place in it. In particular, they have usefully explored Lamarck's place in a number of the French natural historical debates of the early nineteenth century. For example, in "Paléontologie(s) et évolution au début du XIXe siècle: Cuvier et Lamarck," (2000), Laurent has argued that Lamarck's work as an invertebrate zoologist was influential and well-known among French nineteenth-century

---

[5] Adrian Desmond, *The Politics of Evolution: Morphology, Medicine, and Reform in Radical London* (Chicago: University of Chicago Press, 1989); on the further political associations of evolutionary ideas see also Piers J. Hale, *Political Descent: Malthus, Mutualism, and the Politics of Evolution in Victorian England* (Chicago: University of Chicago Press, 2014).

[6] See Richard Burkhardt, *The Spirit of System: Lamarck and Evolutionary Biology* (Cambridge, M.A.: Harvard University Press, 1977); Richard Burkhardt, "Lamarck, Evolution, and the Politics of Science," *Journal of the History of Biology*, (1970), pp. 275–298; and Andrés Galera, "The Impact of Lamarck's Theory of Evolution Before Darwin's Theory," *Journal of the History of Biology*, (2017), pp. 53–70.

[7] See, for instance, Bentley Glass, Owsei Temkin, and William L. Straus, Jr. (eds.), *Forerunners of Darwin 1745–1859* (Baltimore: The Johns Hopkins Press, [1959], 1968); and Madeleine Barthélemy-Madaule, *Lamarck the Mythical Precursor: A Study of the Relations between Science and Ideology* (Cambridge, Mass.: MIT Press, 1982). In the early twentieth century, the conception of Lamarck as a forerunner to Darwin was also invoked by some French historians, often using the precursor myth to argue that Lamarck's theory was unjustly ignored prior to Darwin's. For example, see Louis de Nussac, "Lamarck et le muséum d'histoire naturelle," *Aesculape*, Vol. 12, (1912), pp. 64–68.

paleontologists, and helped advance the cause of transformism. In *The Age of Lamarck: Evolutionary Theories in France, 1790–1830* (1988), Corsi has made the case that Lamarck's belief in species transformation was not wholly anomalous among his peers, and that he was neither universally criticized nor ignored, but worked largely within the mainstream of contemporaneous French science. Corsi emphasized Lamarck's social and intellectual connections to his colleagues and the dissemination of his ideas by his students and those who attended his lectures, in contrast to the myth (which Lamarck himself perpetuated) of the solitary martyr to science.[8] Corsi and Laurent have brought much-needed attention to the ways in which Lamarck's transformist theory was propagated and discussed in Europe long before Charles Darwin had even put pen to paper, thus helping to shift historical focus away from Lamarck as a mere forerunner or precursor to Darwin.

However, for all its strengths in this direction, it remains the case that even the literature focused on Lamarck has neither thoroughly nor adequately addressed his investigations into human organization and the physiology of mind. In particular, historians of science have often minimized the role of desire and the will in his writing. For example, Richard Burkhardt pointed out that Lamarck only ascribed will to a select few, highly complex organisms, and therefore it "could play no major role in the general process of organic change."[9] Robert J. Richards similarly argued that Lamarck's explanation of organic change was dependent on needs and habits, not the will, stating categorically that "Will, as he understood it and in its usual meaning,

---

[8] See also Corsi, "Before Darwin: Transformist Concepts in European Natural History," *Journal of the History of Biology*, (Spring 2005), pp. 67–83; and Corsi, "The Revolutions of Evolution: Geoffroy and Lamarck, 1825–1840," *Bulletin du Musée D'Anthropologie Préhistorique de Monaco*, (2011), pp. 113–134.

[9] Burkhardt, *Spirit of System* (1977), p. 175. See also Jordanova, *Lamarck* (1984), p.55.

simply had no immediate role in evolution."[10] Corsi characterized Lamarck's 'will' as "simply the phenomenal expression of a complex process of nervous fluid dynamics," minimizing the role of desire.[11] Such arguments have generally been deployed against the notion that Lamarck considered species transmutation writ large to be a consciously directed process, with the will merely the antiquated insertion of a psychic element into the fledgling biological sciences.[12] In light of the fact that so many Darwin scholars took Darwin's word on Lamarck believing that animals willed their own adaptations, to Burkhardt, Richards, Jordanova, and others, it bore repeating that Lamarck did not in fact consider the vast majority of organisms to be capable of any kind of willed control of their own development.

What I want to do here, however, is to move beyond this backlash against the ridicule that Darwin (and, as we shall see, the eminent comparative anatomist Georges Cuvier and the geologist Charles Lyell) heaped upon Lamarck and his ideas, to note that Lamarck did in fact believe that the role of the will was of particular importance. To make this case, though, and to get Lamarck right on this point, we need to shift the frame of the debate further. It is not sufficient to merely consider Lamarck's transformism in its own right: we must do so in the right context, and for this we need to focus on his conception of human origins and development. Furthermore, we need to recognize that in tackling this subject, Lamarck sought not to make a contribution to evolutionary biology, *per se*, but to prevailing debates in France about the

---

[10] Richards, "The Emergence of Evolutionary Biology of Behavior in the Nineteenth Century" (1982), p. 267.

[11] Corsi, "Transformist Concepts in European Natural History" (2005), p. 70.

[12] For example, see J. Walter Wilson, "Biology Attains Maturity in the Nineteenth Century" in Marshall Clagett (ed.), *Critical Problems in the History of Science* (Madison, W.I.: University of Wisconsin Press, 1969), pp. 401–18.

physiology of mind and morals, and the future development of the French nation. In this context, the notion of progressive development and the will were not amusing asides that showed their author to be out of touch with contemporary debates in natural science, but rather were widely accepted as central concepts in a debate of national importance. In Lamarck's system the will was a crucial link between his natural historical account of species and his concerns with humans in society. It appeared in his writing not because he was a lone voice carrying on a tradition of unscientific eighteenth-century vitalist conjecture, but because he was intensely interested in the ongoing debates about the possibility of guiding human progress and French national policy. Lamarck's understanding of human physiology allowed him to identify what he believed to be the natural historical origin and the manner of development of moral agency, an approach that he used to stress the particular insights a naturalist might have into debates about society and moral reform that had occupied French political commentators since at least the mid-eighteenth century.

Here I thus provide a close reading of Lamarck's works in order to facilitate a reexamination of his own ideas on the will. However, this is not merely a history of ideas. Rather, I go on from this to place Lamarck's ideas about mind, morality, and human agency in the rich political and intellectual context of debate about the natural historical, social, and political state and development of the French nation. Thus, in part one I provide an account of the construction of the mythical Lamarck that has long been the subject of ridicule among English naturalists and their more recent historian descendants. As I have already suggested, this began with Lamarck's contemporary, colleague, and rival Georges Cuvier, but was picked up and

amplified in England by Darwin's mentor, Charles Lyell, and subsequently echoed by Darwin Hooker, and others in their circle.

In part two, I build upon the work of historians like Pietro Corsi, Robert Richards, and Ludmilla Jordanova, who have reexamined Lamarck's transformist arguments and shown that he did not consider evolution in general to be a voluntary process. As mentioned, the work of these scholars has been an under-appreciated and important corrective to much of the Darwin-centered historiography. Having laid out this literature, I indicate where my study departs from its main conception of Lamarck's understanding of the will. I flesh out the historical understanding of Lamarck's theories by closely examining the ways in which he genuinely did invoke the will when discussing the natural historical connections he saw between physiology, morality, and society. It is in this section that I argue that Lamarck's consideration of will and moral agency played a crucial role in his social and political commentary, thus locating both Lamarck and transformism within the context of ongoing concerns with human development and social change.

Finally, in section three I focus on how Lamarck's comments on the physiology of mind and morals attempted to answer calls for social and political reformation and regeneration in France. I locate Lamarck within ongoing debates in natural history, medicine and physiology, and political philosophy, focusing on concerns over the progress or degeneration of the human species, and of the French nation in particular. Thus, while Lamarck's theory of species transformation was certainly an important aspect of his thought, I argue that it was only one part of a much wider investigation into social change, moral reformation, and national development.

Part I. In Darwin's shadow

Lamarck spent much of his career as a botanist, conchologist, and invertebrate zoologist. However, by 1844 it is clear that Darwin was invoking his name to imply something quite different. Writing to Hooker, Darwin had disavowed himself of all "Lamarck nonsense"—namely a tendency to progressive development and the idea that animals could, over time, will their own change. As I have pointed out, Darwin's characterization of Lamarck and his ideas has persisted in much of the historical literature, along with the related idea that Lamarck had some special responsibility for the idea of the inheritance of acquired characteristics, while Darwin alone was responsible for a wholly different mode of speciation: 'natural selection.'[13]

While my focus in this thesis is on the role of the will in Lamarck's thought, the question of progressive development and the debate over mechanisms of organic change are both germane to this issue. For Darwin, "Lamarck nonsense" was convenient shorthand for a combination of all three ideas: a process whereby an animal could voluntarily perfect itself in response to its own wants and needs, eventually passing the new characteristics on to its offspring and thereby improving the whole species. Darwin was particularly influenced by his mentor the geologist Charles Lyell (1797–1875), and Lamarck's eulogist, Georges Cuvier (1769–1832), in forming this idea of what 'Lamarckism' meant, and Cuvier's, Lyell's, and Darwin's remarks have powerfully affected the historical view of Lamarck and his ideas. Lamarck has persistently been

---

[13] This was in spite of the fact that it is well known that Darwin, in addition to many other theorists, had proposed not only some form of the inheritance of acquired characters, but of natural selection as well. See "An Historical Sketch of the Progress of Opinion on the Origin of Species, Previously to the Publication of the First Edition of this Work," in Charles Darwin, *The Origin of Species by Means of Natural Selection, or the Preservation of the Favored Races in the Struggle for Life* (London: John Murray, 1872), pp. xiii–xxi.

interpreted with reference to Darwin, limiting the portrayal of both Lamarck and his ideas to the parameters that Darwin's understanding of them had established.

Lamarck's comments on the will most likely came to Darwin's attention via the second volume of Lyell's *Principles of Geology*, which was published in 1832. In it Lyell echoed much of the criticism of Lamarck found in the *éloge* given by Lamarck's former colleague and rival, the French naturalist Georges Cuvier.[14] There is thus a direct intellectual lineage from Cuvier's sarcastic misrepresentation of Lamarck's mechanism of species transformation to Darwin's misunderstanding of "Lamarck nonsense," as found in his 1844 letter to Hooker.

A staunch and longtime critic of species transformation, in his *éloge* Cuvier had collapsed together the roles of desire and habit, claiming that according to his deceased colleague's theory, "it is by the desire to swim that membranes form on the feet of aquatic birds; … by the desire to fly, that the arms of all birds become wings, and their fur and scales develop into feathers."[15] While it was standard practice among naturalists to use the form of the *éloge* to criticize each other posthumously, Cuvier was particularly adept at doing so. His *éloge* of Lamarck is a striking example of what historian Dorinda Outram has characterized as the tendency to "celebrate an image of the natural philosopher as apolitical and asocial," a strategy that permitted hidden, implied discussions of power and politics.[16] In this case, Cuvier's depoliticized description was then paraphrased by Lyell in his own refutation of species mutability, perpetuating the idea that

---

[14] See Lyell, *Principles of Geology*, Vol. II (1832), pp. 1–22. See especially pp. 9–10.

[15] Cuvier, "Éloge de Lamarck" *Recueil des Éloges Historiques*, Vol. III, (1861), pp. 198–199. Translation is mine.

[16] Dorinda Outram, "The Languages of Natural Power: The '*Éloges*' of Georges Cuvier and the Public Language of Nineteenth Century Science" *History of Science*, (1978), p. 154.

Lamarck had been little more than a backwards-thinking transformist whose view of nature was irremediably tainted by what Lyell referred to as "fictions as ideal as the 'plastic virtue' and other phantoms of the geologists of the middle ages."[17] This reading of Lamarck was then passed along to Lyell's friend and mentee Darwin, as evidenced by the 1844 letter to Hooker in which Darwin denounced "'adaptations from the slow willing of animals' &c," clarifying that his own belief in species mutability depended on entirely different means of change.[18]

As Michael Bartholomew has long since shown, Lyell was also alarmed that Lamarck's transformism implied a progressive natural history of human intelligence and therefore also the capacity for voluntary action.[19] Lyell's critique specified that Lamarck's theory included a "*tendency to progressive advancement* in organization, accompanied by greater dignity in instinct, intelligence, &c," and that belief in species transformation ensured "the future perfectibility of man in his physical, intellectual, and moral attributes."[20] While Darwin was not troubled by this aspect of Lamarck's theory, as we have seen, he did adopt Lyell's concern, taken from Cuvier, regarding ideas about both an innate "tendency to progression" and organisms willing their own change.[21]

---

[17] Lyell, *Principles of Geology*, Vol. II (1832), p. 11.

[18] Charles Darwin to Joseph Dalton Hooker, 11 January 1844, Frederick Burkhardt et al. (eds.), *The Correspondence of Charles Darwin*, Vol. 3 (Cambridge: Cambridge University Press, 1987), pp. 1–3.

[19] Michael Bartholomew, "Lyell and Evolution: An account of Lyell's response to the prospect of an evolutionary ancestry for man," *British Journal for the History of Science*, (June 1973), pp. 261–303.

[20] Lyell, *Principles of Geology*, Vol. II (1832) pp. 16–17, 27. Original emphasis.

[21] Charles Darwin to Joseph Dalton Hooker, 11 January 1844, Frederick Burkhardt et al. (eds.), *The Correspondence of Charles Darwin*, Vol. 3 (Cambridge: Cambridge University Press, 1987), pp. 1–3.

As Pietro Corsi showed in his 2005 essay on transformist ideas in Europe before Darwin, Cuvier and Lyell were far from the only naturalists to propagate Lamarck's name and variations of his ideas throughout Europe in the nineteenth century.[22] Still, it was largely through Lyell's critique that Charles Darwin formed his conception of Lamarck's mechanism of species change, and Lyell and Cuvier both portrayed Lamarck in a similar fashion—namely, as an atavistic, or at least outmoded, system-builder whose empirical evidence was shaky at best, and who had failed to adapt to the new positive science of the nineteenth century.[23]

The result of this attitude was that while Darwin considered Lamarck to have reached a conclusion similar to his own regarding species malleability, following Lyell, he saw Lamarck's mechanism of change as wholly unsuitable for proper science. Darwin's erroneous evaluation of Lamarck's theory was not only based on a misunderstanding of the role of the will in species transformation, but also demonstrated his lack of awareness that Lamarck was writing in the context of ongoing discussion in France that also engaged with with social regeneration and change.

Darwin's limited view of Lamarck has led scholars to similarly treat the Frenchman as an early biologist and evolutionist, and to evaluate his success and significance on this terrain alone. Historians of science have long rejected a simple conception of Lamarck as the unfairly maligned 'precursor' to Darwin.[24] Nevertheless, existing literature on Lamarck's ideas has

---

[22] Corsi, "Transformist Concepts in European Natural History" (2005), pp. 68–73.

[23] On the proper roles of facts and systems in European science, see Appendix A.

[24] For example, see Madeline Barthélemy-Madaule, *Lamarck, the Mythical Precursor* (1982).

generally focused on his role as a pre-Darwinian defender of evolutionary theory.[25] Where Lamarck's other interests have been noted, his physico-chemical theories have often been considered an embarrassing detraction from his more serious biological work, especially given his repeated attempts to refute Lavoisierian chemistry,[26] and although his discussion of human physiology has sparked some interest in the extent to which he contributed to nineteenth-century debates about mind and psychology, scholars have noted that his ideas were often spread indirectly, via a student or critic.[27]

These aspects of Lamarck's work are certainly important, and demonstrate that there is still much of significance in Lamarck's work that merits further investigation, but comparatively little has been made of his interest in the connections between physiology, morality, and social reform. Consequently, the role of the will in his thought has been minimized and misunderstood. For Lamarck, the nascent science of *biologie* was bound up inextricably with his interest in social change and moral agency. Natural and social transformation had produced moral agency in humans and endowed them with free will, and thus the ability to change their own environments

---

[25] For example, see Burkhardt, "Lamarck, Evolution, and the Politics of Science" (1970); Burkhardt, *Spirit of System* (1977); Corsi, *The Age of Lamarck* (1988); Corsi, "Transformist Concepts in European Natural History" (2005); and Desmond, *The Politics of Evolution* (1989).

[26] For example, see Burlingame, "Lamarck's Chemistry: The Chemical Revolution Rejected," in Woolf, Henrey (ed.), *The Analytic Spirit: Essays in the History of Science in Honor of Henry Guerlac* (Ithaca: Cornell University Press, 1981), pp. 64–81.

[27] For example, see Baertschi, "Diderot, Cabanis, and Lamarck on Psycho-Physical Causality" *History and Philosophy of the Life Sciences*, (2005), pp. 451–63; Gissis, "Lamarck on Feelings: From Worms to Humans," in Wolfe, C.T. & O. Gal (eds.), *The Body as Object and Instrument of Knowledge: Embodied Empiricism in Early Modern Science* (Dordrecht: Springer, 2010), pp. 211–39; Richards, "The Emergence of Evolutionary Biology of Behavior in the Nineteenth Century" (1982); Richards, "The Influence of Sensationalist Tradition on Early Theories of the Evolution of Behavior" (1979); and Robert M. Young, "The Role of Psychology in the Nineteenth-Century Evolutionary Debate," in Henle, Mary, Julian Jaynes, & John J. Sullivan (eds.), *Historical Conceptions of Psychology* (New York: Springer, 1973), pp.180–204.

and to develop their mental and moral capacities, facilitating the continual re-forming and re-creation of society.

This much suggests that what is really needed is a thorough analysis of Lamarck's ideas about the will, and the physiology of mind and morals upon which they were based, in the context of ongoing debates about social reform in France in the early decades of the nineteenth century. Whereas, since Robert Young's signal essay on Malthus and the evolutionists (1969),[28] Darwin scholars have sought to place Darwin's work in its social and political context, this has yet to be done adequately for Lamarck. Before this can be done, however, it is necessary to revisit and reframe what Lamarck actually said about the will. This will serve as an important corrective given that so much that has been written on this subject is misinformed or simply wrong, but it will also allow us to consider Lamarck's ideas about the will in the context of French political and social reform.

Part II. Lamarck in his own words

According to Lamarck, higher animals, like humans, had more organs and thus more faculties than lower ones, and the will had its origin in acts of judgment carried out by the organ of intelligence. While the process of species transformation could thus provide a history of the intellectual faculties, Lamarck's investigation of agency and the will was grounded in his interest in human physiology. This aspect of his thought placed him within a tradition that was not only natural historical, but also medical—a connection I explore more fully in part three of this essay. In this section my aim is twofold. First, to make Lamarck's ideas about the will clear, which will

---

[28] Robert M. Young, "Malthus and the evolutionists: the common context of biological and social theory," *Past & Present*, (May 1969), pp. 109–45.

then allow us to see how they fit into broader natural historical, physiological, and medical considerations of the human species in the context of French national debate. My second concern is the social implications of the capacity for voluntary action. Lamarck was not only interested in the will as a biological or physiological phenomenon within an individual organism; he also believed that it allowed humans to play an active role in their own ongoing species development —to be agents of their own future. This idea should not be confused with the caricature of a water-bird willing membranes to form between its toes, as Cuvier and Lyell each mockingly suggested. Instead, Lamarck understood biological changes to the human species in concert with existing social and political conditions, and thus he believed that social reform and management of the environment were key factors in the ongoing development of the species. By emphasizing the importance of the will, my goal is to show how Lamarck discussed natural transformation and social change as complementary forces. It was by this linkage that he claimed that naturalists had a uniquely important perspective on social and political issues.

i. Intelligence and the will to change

Like many naturalists of his day, Lamarck pursued medical studies after he left the army in 1766. Accounts of this period of his life are sparse, but one letter from his daughter, Rosalie, indicates that he studied medicine at l'école de médecin beginning in 1772, a date that is consistent with that given in the *éloge* delivered by Étienne Geoffroy Saint-Hilaire (1772–1844) at Lamarck's funeral on December 20, 1829. While Rosalie's letter did not specify how long the course lasted, Geoffroy stated that Lamarck's studies occupied him for the following four years, a claim repeated by the historian Marcel Landrieu in 1909. Unfortunately, though, Landrieu was

unable to find any record of Lamarck in the medical school's archive.[29] However, the 1830 auction catalogue for Lamarck's personal library includes more than two dozen texts on medicine, physiology, and anatomy, including several reference books from the 1770s.[30] While Lamarck never practiced medicine, it is clear from these books that he was aware not only of the basics of anatomy and physiology, but of the broader discussions of the effects of climate and environment on physiological function.

Lamarck's interest in medicine persisted throughout his career. For example, from 1799–1810 he published his *Annuaires météorologiques*, a series of almanacs that he proclaimed were written particularly for the benefit of doctors. In 1797 he even sent two copies of his *Mémoires de physique et d'histoire naturelle* (1797) to the faculty of the École de Santé to keep in the school's library.[31] Lamarck composed these texts as contributions to medical discourse because he argued that the atmosphere and environment were in a constant process of exchange with the "*économie animale*," a term adopted by French medical vitalists in the eighteenth century to express a monistic view of humans as both physical and moral beings.[32] The intimate *rapports*

---

[29] Landrieu relayed that the archives of the Paris Faculty of Medicine from the years predating the Revolution had been lost, and the "Commentaires de ce qui s'est fait et passé de remarquable à la Faculté de médecine de Paris" in the Bibliothèque contained no record of Lamarck. Landrieu speculated that he may have been affiliated only with the Faculté's "brilliant rival" l'Académie de Chirurgie. Landrieu, *Lamarck, le fondateur du transformisme: sa vie, son œuvre* (Paris: Société Zoologique de France, 1909), p. 25, n. 2.

[30] "Catalogue des livres de la bibliothèque de feu M. le chevalier J.B. Lamarck" (Paris: Imprimerie et Fonderie de Fain, 1830). The books are grouped loosely by subject matter, and the overtly medical, physiological, and anatomical texts appear on pp. 4–5, nos. 63–94.

[31] The letter in which Lamarck provided this explanation, dated 29 floréal an V, appeared in the 1909 *Bulletin de la Société française d'histoire de la médecine* (Paris: Honoré Champion, 1909), n. 8, pp. 185–6.

[32] On *l'économie animale* and the Montpellier vitalists, see Bernard Balan, "Premières recherches sur l'origine et la formation du concept d'économie animale," *Revue d'histoire des sciences*, (Oct. 1975), pp. 289–326; Charles T. Wolfe & Motoichi Terada, "The Animal Economy as Object and Program in Montpellier Vitalism," *Science in Context*, (2008), pp. 537–579; and Philippe Huneman, "Montpellier Vitalism and the Emergence of Alienism in France (1750–1800): The Case of the Passions," *Science in Context*, (2008), pp. 615–647.

between the physical and moral aspects made physics and meteorological observations foundational to good medical practice, which was itself considered more a moral art than an act of mechanical healing.[33] Lamarck continued to use the term "*économie animale*," as well as the related "*organisation*" and "*organisation animale*," in every major text from the *Recherches* of 1794 through the *Système* of 1820.[34]

In addition to his medical studies, Lamarck studied botany under the naturalist Bernard de Jussieu (1699–1777). Here again he was focused on the adaptation of certain plants to their environment and the apparent heritability of these acquired characteristics.[35] It was clearly in light of extensive reading in fields that addressed adaptations to environment among both plants and animals that he solidified his belief in species transformation, which he had done by 1800. It is likely that he first theorized this in relation to his work with plants, but by the time he published the *Philosophie* in 1809 Lamarck clearly believed that the implications of the theory were of the greatest importance for humanity.

His interests in weather, physico-chemistry, and atmospheric fluids were thus much more than peripheral attachments to a proto-theory of evolution. Rather, he deliberately took all of these concerns into account as environmental factors as he sought to explain how humans had come to exist in their present state—physically, socially, and morally. As early as his *Recherches sur les causes des principaux faits physiques* (which, although published in 1794, was drafted

---

[33] For example, see Lamarck, *Annuaire météorologique de l'an XI* (Paris: Maillard, 1803), pp. 7–8.

[34] For this insight I am indebted to the text-searchable editions of Lamarck's works maintained by CNRS under the direction of Pietro Corsi, www.lamarck.net.

[35] For example, see Lamarck, "Jardin de botanique," *Encyclopédie méthodique* (Paris: Panckoucke, 1783), Vol. 3, pp. 211–215.

between 1776 and 1780), he had proposed that living bodies were shaped by the motion of certain vital fluids, namely electricity, caloric, and the magnetic fluid.[36] These fluids passed freely between the environment and an individual's body, meaning that the animal economy and physiology were always enmeshed in a larger process of material exchange and circulation with the outside world.[37] Inside the body, the fluids underwent "animalization," and, having done so, maintained the animal's irritability and caused its vital movements. As the fluids flowed through the cellular tissue in response to the animal's received impressions, they carved out new channels and "tubes," eventually resulting in a more complex organization.[38] In more developed species, this process eventually created an organ of intelligence, which was sufficiently complicated to carry out the judgments and deliberations necessary to *will* certain actions.[39]

Lamarck very deliberately claimed agnosticism on the topic of a soul or vital principle: "The only knowledge that we can acquire [of an exciting cause of organic movements] is, and always will be, confined to what we can glean from the study of [nature's] laws; beyond nature, in a word, is only confusion and lies."[40] In this way he distinguished himself from the ancient philosophers, whom he accused of "creat[ing] mere words, which could only be attached to

---

[36] A more developed version of the "hydraulic model" appeared in *Recherches sur l'organisation des corps vivans* (Paris: Centre de Recherche en Histoire des Sciences et des Techniques, 2001, 1802), see especially pp. 157–200.

[37] On the connection between Lamarck's geological and physico-chemical views and his mechanics of feeling and sensibility, see Snait B. Gissis, "Lamarck on Feelings: From Worms to Humans," in Wolfe & Gal, *The Body as Object and Instrument of Knowledge: Empiricism in Early Modern Science* (Dordrecht: Springer, 2010), pp. 211–239.

[38] See Lamarck, *Zoological Philosophy*, (London: Macmillan & Co, Ltd., [1809], 1914), esp. pp. 201–233.

[39] Lamarck, *Zoological Philosophy*, (1914), p. 355.

[40] Lamarck, *Philosophie zoologique* (1809), Vol. II, p. 3. See also Lamarck, "Nature" (1818), pp. 343–99; and Lamarck, *Système analytique* (1820), p. 8.

vague and unfounded ideas" because they lacked the "positive knowledge" that could be generated by careful observations of nature.[41] Furthermore, he explicitly denied that matter itself could possess the faculty of sensitivity.[42] Instead, it was only the being "in its entirety" that could feel, a position that has led both Gissis (2010) and Bernard Baertschi (2005) to argue that for Lamarck, feeling was an emergent property.[43] Still, Baertschi assigned Lamarck to a "materialist" camp, and indeed intelligence, will, and one's *sentiment intérieur* were all material phenomena in the sense that Lamarck considered matter a necessary precondition for any such subjective experience. He considered the moral and physical domains to be ontologically distinct but intrinsically united; intelligent beings experienced not just physical needs and emotions, but moral ones as well. It was via these latter that humans could excite their own "will to action," while the former simply resulted in automatic, involuntary acts.[44]

According to Lamarck's conception of humans, the will was the most fundamental aspect of agency, as emotions could incite movement only indirectly. In order to act by their own power, whether voluntarily or involuntarily, animals needed an "intimate feeling of their existence," or *sentiment intérieur*, which was a generalized sense of self that arose from the amalgamation of

---

[41] Lamarck, *Philosophie zoologique* (1809), Vol. II, pp. 2–3

[42] Lamarck, *Philosophie zoologique*, (1809), Vol. II, p. 252.

[43] Gissis, "Lamarck on Feelings" (2010), p. 224; and Bernard Baertschi, "Diderot, Cabanis and Lamarck on Psycho-Physical Causality," *History and Philosophy of the Life Sciences*, (2005), pp. 451–63. Looking at France in the eighteenth century, Timo Kaitaro has also discussed the argument that living organisms could possess certain vital properties that their material parts did not possess. For Kaitaro this argument was characteristic of French "vital materialism," and occupied a middle ground between what is now called vitalism and emergentism. Kaitaro, "Can Matter Mark the Hours? Eighteenth-Century Vitalist Materialism and Functional Properties," *Science in Context*, (2008), pp. 581–92.

[44] Lamarck, *Philosophie zoologique,* (1809), Vol. II, pp. 294.

all their physical sensations.[45] Intelligent animals could even notice (*apercevoir*) this feeling, and after deliberation and judgment could act by their "more or less free" will.[46] Voluntary action was thus a kind of dialectic between the material body and the subjective experience, but it was a developmental relationship. This understanding of the moral domain was what led Lamarck to argue that "the moral feeling exercises in course of time a greater influence on the organization than the physical feeling is capable of working."[47] His views on the will and moral feeling thus drew from a monistic-materialist perspective, and were far more nuanced than Cuvier's absurd portrayal of animals 'willing' their own organs into existence.

However, this is not to dismiss the importance of self-directed physiological change in Lamarck's thought. After all, it was the repeated motion of the vital fluids that carved out and widened certain channels and tubes inside the physical organism, and the individual's own thoughts and actions that directed those fluids. Habitually repeating the same actions, or living in the same environmental conditions, would thus re-form one's physical organization, and such changes could be inherited. From "stale air" and malnourishment[48] to climate[49] to education[50] to being forced to submit to authority[51]—any aspect of one's manner of living would eventually make its mark upon the body. And Lamarck was quite clear that this process influenced the

---

[45] Lamarck, *Philosophie zoologique,* (1809), Vol. II, p. 256.

[46] Lamarck, *Philosophie zoologique,* (1809), Vol. II, p. 313.

[47] Lamarck, *Philosophie zoologique,* (1809), Vol. II, pp. 291–2

[48] Lamarck, *Zoological Philosophy,* (1914), p. 160.

[49] Lamarck, *Zoological Philosophy,* (1914), p. 114.

[50] Lamarck, *Zoological Philosophy*, (1914), p. 383; Lamarck, *Système analytique* (1820), p. 284.

[51] Lamarck, *Zoological Philosophy*, (1914), p. 399; Lamarck, *Système analytique* (1820), pp. 342–4.

intelligence, too, insofar as it was the product of a particularly complicated organization. "One observation that has struck me for a long time," he wrote in his 1802 *Recherches sur l'organisation des corps vivans*,

> is that having remarked that the habitual use and exercise of an organ proportionally develops its extent and faculties, just as lack of use proportionally diminishes its strength … I noticed that of all the organs of the human body, the one most forcefully subdued to this influence … is the organ of thought—in a word, the brain of man.[52]

For Lamarck, then, 'willing' one's own physiological change could simply mean slowly altering one's own physiology by the deliberate cultivation of certain habits. While historians of science have been correct to detach Lamarck's discussion of will and desire from his overall mechanism of species transformation, his account of moral character included the ability for intelligent animals—namely humans—to voluntarily and deliberately direct their self-improvement. Furthermore, such self-development was not a peripheral or secondary concern for Lamarck's biological studies. On the contrary, his interest in human health and well-being may have failed to produce a medical career, but it remained a motivating force throughout his life as he investigated the natural world and living organisms. And, as powerful as the capacity for self-improvement could be on an *individual* level, Lamarck's gaze was ultimately fixed even further afield, on the possibility for *social* reform and transformation.

ii. Biological change as social reform

For Lamarck, the capacity for reason and voluntary action made humans the only species who might capitalize on knowledge of the natural world to ensure and direct their own social

---

[52] Lamarck, *Recherches sur l'organisation des corps vivans* (1802), pp. 125–6. Translation is mine.

progress. In *Philosophie zoologique* he listed, as primary circumstantial factors in organic variation, the climate, temperature, atmosphere, place, manner of living, and daily actions and habits.[53] Controlling or altering any of these factors would thus have physical effects on individuals, who could then pass on these acquired physical characteristics to their offspring. Lamarck was no saltationist, but believed adaptations slowly and gradually accumulated over immense periods of time. Substantial physiological changes on a species level, such as the appearance of a new organ, could therefore take millennia, but the effects of habituation were apparent within an individual's lifespan. These habitual changes were central to Lamarck's consideration of how human society might benefit from the lessons to be learned from his transmutationist natural history.

As I noted above in subsection 1, Lamarck thought the brain was particularly susceptible to the effects of habitual actions and thoughts. He also believed that the physical organization was most malleable in youth, which meant that a person's mental physiology would bear the imprint of their earliest experiences throughout the rest of their life. A habit or inclination that one persistently indulged as a child could eventually result in irreversible physiological changes in that individual.[54] Lamarck did believe, following P.J.G. Cabanis and the sensationalists, that people's predilections and penchants arose from their experiences and mileux, rather than being innate to the species. And he argued that even when a specific tendency was inherited, it could be reversed, provided the afflicted individual did not "strongly and habitually" exercise its

---

[53] Lamarck, *Zoological Philosophy* (1914), p. 114.

[54] Lamarck, *Zoological Philosophy* (1914), p. 370.

corresponding faculties.[55] But the physiological imprints of childhood were nonetheless hard to escape later on, even if the stiffer brain tissue of adults could be remodelled by the fluid effects of habitual actions. Lamarck's argument was not an essentialist one, but he did see the possibility that certain traits might become somewhat fixed. That is, the effects of habituation and the environment could be constraining for individuals, even though the species remained physiologically malleable.[56]

While Lamarck hardly seems to have been any kind of political radical, he did discuss some social implications of his physiological arguments. For instance, he considered early education particularly important, as it would strengthen the intellect and direct people's attention to their moral needs and well-being. Education was therefore more than just the acquisition of specific knowledge; it inculcated the habit of varying one's thoughts, which stimulated the complex ideas and mental operations that led to the development of the physical, natural, political, and moral sciences.[57] In contrast, those whose circumstances forced them to occupy every day with "the same ideas, doing the same work" suffered monotony in mind as well as body.[58]

---

[55] Lamarck, *Philosophie zoologique* (1809), Vol. II, pp. 364–5.

[56] Lamarck's account of instinctual behaviors described them as examples of such *relatively* fixed traits: two parents who had developed similar habits and propensities could pass along the acquired changes in their organization to their offspring, who would then be inclined toward similar behavior. In infants the instincts dictated their behavior more or less mechanically, but this did not mean that Lamarck believed in 'innate ideas.' See Lamarck, *Philosophie zoologique* (1809), Vol. II, pp. 362–4.

[57] Lamarck, *Zoological Philosophy,* (1914), p. 383.

[58] Lamarck, *Philosophie zoologique*, Vol. 2 (1809), pp. 414–5.

This was a problem Lamarck saw as an unfortunate consequence of modern industrial civilization.[59] Whereas people in a state of nature would all be more or less equally exposed to a variety of experiences and influences, with civilization came the poverty of the multitude, reduced to "coarse and arduous work which … considerably limited their ideas."[60] Repeating the same actions and habits meant the vital fluids would rush through the same few tubes and channels in a person's organic tissue over and over again. But variation in the motion of the vital fluids was what would normally drive the development and complication of the organization, particularly in the brain.[61] Instead, for those whose actions became limited and repetitive, the motion of the fluids was correspondingly confined, making their habitual thoughts and actions become ever more entrenched. Lifestyle and organization exerted a mutual influence on each other, and the intellectual faculties could not develop according to their full potential.

This had important ramifications not just for individuals, but for human society at large. Over time, the tendency for civilization to limit people's daily actions and thoughts led to a corresponding "scale of degrees of intelligence," which allowed people to dominate and abuse one another.[62] Those who varied their daily activities and work would slowly strengthen and develop their organs of intelligence, but those who repeated the same actions every day, whether by their own volition or due to circumstances outside their control, would stagnate. Lamarck

---

[59] While Lamarck did not exclude the possibility of 'civilized' countries outside of Europe, in his published works he was generally referring to Europeans when he discussed the state of humans in civilization. For example, see Lamarck, *Histoire naturelle des animaux sans vertèbres* (Paris: Deterville, 1815–22), p. 280; passage reprinted in Lamarck, *Système analytique* (1820), p. 209.

[60] Lamarck, *Système analytique* (1820), p. 282.

[61] Lamarck, *Recherches sur l'organisation des corps vivans* (1802), p. 128; see also Lamarck, *Philosophie zoologique* (1809), Vol. I, p. 374.

[62] Lamarck, *Système analytique* (1820), pp. 280–285; 332–3.

considered this scale of intelligence to be a barrier to the improvement of human society. In fact, he argued that diminishing the inequality in people's intellectual faculties was the most important thing for humanity's betterment (*perfectionnement*) and happiness.[63] While civilization had produced a few geniuses—in *Recherches* (1802), Lamarck named Newton, Bacon, Montesquieu, and Voltaire as examples—it left "the immense multitude" vulnerable to abuse and domination by the more powerful few.[64] These variations in people's manner of living were, for Lamarck, the naturalistic explanation of social inequalities. In other words, humanity's natural history was also its social history.

That humans were endowed with intelligence thus indicated the possibility for conscious self-betterment, as cultivating the right habits and environment would favorably mold their organization. Over time, the human species as a whole could make itself more intelligent, happier, and more sociable. But this was only one possible future, and Lamarck thought it would be difficult for those in civilization, with its strict division of labor and dully repetitive lifestyles, to achieve this end. While Lamarck was aware that there were other theorists who had advanced ideas about how best to improve society on a moral basis, he was of the opinion that they proceeded in ignorance if they did not take note of the insights to be derived from his natural history. Correctly understood, the two approaches necessarily complemented one another. "As the objects I am going to consider have been considered as the exclusive domain of the *moralist*," he wrote in *Histoire*, "the obvious part belonging to the *naturalist* has not been

---

[63] Lamarck, *Philosophie zoologique* (1809), Vol. II, p. 345.

[64] Lamarck, *Système analytique* (1820), p. 209.

sufficiently recognized."[65] The naturalist's contribution was critical for ensuring social harmony, cooperation, and social progress. Without a proper physiological understanding of the origins of human actions and tendencies, it would be virtually impossible to direct one's own conduct, or that of others, in a manner favorable to the improvement of society.

For Lamarck, then, *biologie* was bound up inextricably with social change and moral agency, and he was always attuned to the links he saw between the history of nature and the future of society. Natural and social transformation produced humans as moral agents endowed with free will, and humans could in turn change their own bodies and environments, continually re-forming and re-creating society. This was the real role of the will in biological change.

Part III. The French context

My aim in this thesis is not only to provide my own reading of Lamarck, but also to contextualize his biological work as a response to pressing social and political issues of his day. Previous scholarship on the politics of Lamarck's theories has turned up some fascinating links to radical and republican politics, particularly throughout the nineteenth century. Adrian Desmond's landmark *The Politics of Evolution* (1989) explored the invocation of Lamarckism by working-class British radicals in the early and mid-nineteenth century, though Desmond pointed out that there were important distinctions between Lamarck's actual ideas and the "cannibalized fragments" of them that were repurposed in pauper presses to support calls for democracy and anti-clericalism.[66] Similarly, Richard Burkhardt noted that Lamarck was associated

---

[65] Lamarck, *Histoire naturelle des animaux sans vertèbres* (1815–22), p. 281. Original emphasis.

[66] Adrian Desmond, *The Politics of Evolution: Morphology, Medicine, and Reform in Radical London* (Chicago: University of Chicago Press, 1989), p. 4.

posthumously with radical materialist theories of nature and life, though Burkhardt argued that Lamarck himself did not attach "ideas of social reform" to his own scientific work.[67] Burkhardt and Desmond were both correct in pointing out that nineteenth-century 'Lamarckians' often had little in common with Lamarck himself, and Lamarck certainly was not anticipating British republican politics when he developed his transformist theory.

However, the focus on what Lamarck's name meant in the British context has cost historians of science a fuller understanding of his place in relation to the social and political issues of his own time and place. This gap has been only partially addressed in literature focused on Lamarck. For instance, in *The Age of Lamarck*, Corsi noted that some French naturalists in the early nineteenth century argued that their studies of the nervous system and the intellectual faculties uniquely qualified them to offer "positive" speculations on social and political questions.[68] Lamarck was among these naturalists, and claimed in *Système analytique des connaissances positives de l'homme* (1820) that his physiological knowledge formed the basis of a natural history of human society. Corsi also noted that Lamarck made several references to the Idéologues Anthelme Richerand (1779–1840) and Pierre-Jean-Georges Cabanis (1757–1808) from 1809 onward.[69] However, Corsi focused on the paleontological, geological, and anatomical debates that occupied Lamarck's contemporaries throughout Europe, and in this latter context Lamarck's name was chiefly associated with transformism and his work as a botanist and invertebrate zoologist.

---

[67] Burkhardt, *Spirit of System* (1977), p. 38.

[68] Pietro Corsi, *The Age of Lamarck: Evolutionary Theories in France, 1790–1830* (Berkeley: University of California Press, 1988), pp. 187–8.

[69] Corsi, *The Age of Lamarck* (1988), p. 205.

In this section I focus instead on French national concerns about degeneration, social reform, and human perfectibility. These discussions took on particular importance during the Revolutionary period, but were part of the French intellectual landscape throughout Lamarck's life and career. In this context, natural history could be of use in solving certain specific problems: for example, naturalists were called on to reform and improve French agriculture.[70] However, many of these naturalists, including Lamarck, saw profound connections between the natural world and human society, and believed that studying humans as biological organisms also yielded insights into the pressing social questions of the day.

Lamarck drew from the political philosophy of Jean-Jacques Rousseau (1712–1778) to develop his own natural history of social inequalities, and he also wrote in response to the ideas of his mentor the Comte de Buffon (1707–1788), who had believed that the physical environment exerted direct effects on the human constitution. Thus in Lamarck's writing, even social phenomena were influenced by natural factors, giving the naturalist a certain authority on matters of human happiness and well-being. Confronting the prevalent fear of degeneration as much as the optimistic hope for biological perfectability, Lamarck believed his physiological

---

[70] Emma C. Spary, *Utopia's Garden: French Natural History from Old Regime to Revolution* (Chicago: University of Chicago Press, 2000), pp. 123–7; Michael A. Osborne, "Applied Natural History and Utilitarian Ideals: 'Jacobin Science' at the Muséum d'Histoire Naturelle, 1789–1870," in Bryan T. Ragan & Elizabeth A. Williams (eds.), *Recreating Authority in Revolutionary France* (New Brunswick, N.J.: Rutgers University Press, 1992), pp. 125–6; Jessica Riskin, *Science in the Age of Sensibility: The Sentimental Empiricists of the French Enlightenment* (Chicago: University of Chicago Press, 2002), p. 118; and Meghan K. Roberts, *Sentimental Savants: Philosophical Families in Enlightenment France* (Chicago: University of Chicago Press, 2016), Chapter 5).

theories could be used to improve humanity through conscious direction of the development of the human species.[71]

Given Lamarck's interest in medicine, his belief that humans were capable of voluntary self-improvement should be understood in light of French savants' ongoing medical investigations into health as a moral state, and not just a physical one. Thus, building on the work of Robert A. Nye and Elizabeth A. Williams, I place Lamarck within a tradition of what Williams has called "anthropological medicine," in which the intimate links between the physical and the moral were paramount.[72] Well into the nineteenth century, doctors remained intensely interested in the effects of climate, environment, and social milieu on the moral condition of individual patients as well as the human species more generally. One of the most influential figures within this tradition was Pierre-Jean-Georges Cabanis (1757–1808), with whom Lamarck shared a belief in the power of the physical and moral domains to reciprocally shape one another.

Such a perception of the *rapports* between the environment and the stimulation of both the moral and the physiological was key to sensationalist thought, which was developed out of Lockean epistemology during the eighteenth century. Sensationalists believed that people's ideas all took their source from sense perceptions, which meant that controlling the physical environment could also be a way to guide people's thoughts and ideas. In *Utopia's Garden* Emma C. Spary has argued that in the 1790s in particular, the sensationalist conception of the

---

[71] On contemporary concern about degeneration see especially Daniel Pick, *Faces of Degeneration: A European Disorder, c. 1848–1918* (Cambridge: Cambridge University Press, 1989); and Robert A. Nye, *Crime, Madness, and Politics in Modern France: The Medical Concept of National Degeneration* (New Jersey: Princeton University Press, 1984).

[72] Elizabeth A. Williams, *The Physical and the Moral: Anthropology, Physiology, and Philosophical Medicine in France, 1750–1850* (Cambridge: Cambridge University Press, 1994).

relationship between the moral and the physical provided a theoretical underpinning for the new Republic's efforts to morally reform its citizens.[73] Cultivating and presenting the spectacle of nature was a way for the state to produce enlightened people—and naturalists, including Lamarck, participated in this effort.

French naturalists thus saw numerous ways in which their scientific investigations could lead to social betterment, and Lamarck's belief in the possibility of willed biological change needs to be understood in this context. In specialized projects, like maximizing agricultural productivity, as well as in the broader endeavor to manage the natural economy, naturalists had long since believed that their work could improve society both physically and morally.[74] Lamarck's belief that voluntary action played a part in biological change drew from the natural historical, political, and medical endeavors to socially and physiologically improve the human race. It was thus part of a complex investigation into the transformation of both the natural world and human society.

i. Progressive development and degeneration

Lamarck's discussions of human intelligence and social inequality drew from the philosopher and political theorist Jean-Jacques Rousseau, who had written an influential "Discourse on Inequality" as a submission to a 1754 prize competition held by the Academy of Dijon. Rousseau was interested not in "natural" (i.e., biological) inequality, but in social inequality, which manifested primarily as differences in wealth, power, and nobility. He argued

---

[73] Emma C. Spary, *Utopia's Garden: French Natural History from Old Regime to Revolution* (Chicago: University of Chicago Press, 2000).

[74] Spary, Utopia's Garden (2000), pp. 149–54.

that private property underlay all social inequality; man in a state of nature acted to preserve his own existence, but did not seek dominance over others. Rousseau was primarily interested in the consequences of private property, rather than in investigating the conditions that permitted its appearance, but he did argue that natural man lacked reason, which he believed had developed in tandem with civil society. Therefore he wrote (somewhat vaguely) of the "progress through the successive developments of the human mind" as a "conjectural" history of inequality.[75]

Lamarck also saw inequality as a consequence of civilization, though with an emphasis on the effects of the ever-increasing divergence in people's daily needs and habits.[76] What Gissis has called Lamarck's "hydraulic"[77] model of physiological change meant that he considered intelligence to be the result of both the natural history of the human species, and the circumstances of an individual's life. Furthermore, he argued that while intelligence in itself was not harmful, in civil society people's intellectual faculties developed unequally compared to one another, and this caused great harm to the majority of the population, who became vulnerable to domination and abuse as a result.[78] Lamarck thus shared with Rousseau the view that civil society represented a certain corruption of the more ideal state of nature, a belief that followed

---

[75] Rousseau, "Discourse on the Origin and Foundations of Inequality Among Men," in Victor Gourevitch (ed.), *Rousseau: The* Discourses *and Other Early Political Writings* (Cambridge: Cambridge University Press, 1997), pp. 159–60.

[76] Lamarck, *Philosophie zoologique*, Vol. 2 (1809), pp. 280–85, 332–3; and Lamarck, *Système analytique* (1820), p. 282. On Rousseau's influence on Lamarck, see Jacques Roger, "Lamarck et Jean-Jacques Rousseau," *Gesnerus*, (1985), pp. 369–381; and Burkhardt, *Spirit of System* (1977), p. 145.

[77] Gissis, "Lamarck on Feelings" (2010), p. 219. Lamarck's conception of the body as a hydraulic machine was far from novel; European physicians since the seventeenth century had drawn from kinematics and mechanical philosophy to develop such models. See Martin S. Staum, *Cabanis: Enlightenment and Medical Philosophy in the French Revolution* (New Jersey: Princeton University Press, 1980), pp. 55–63.

[78] Lamarck, "Nature," *Nouveau dictionnaire d'histoire naturelle* (Paris: Déterville), Vol. 22, p. 396; and Lamarck, *Histoire naturelle des animaux sans vertèbres* (1815–22), p. 301.

from his conviction that inequality was not only undesirable, but immoral. However, Lamarck's transformist approach meant that his account of social inequality was more overtly biological than Rousseau's. While Lamarck did not believe that any part of living nature was absolutely fixed, he did see the inheritance of acquired traits as a powerful force in reshaping all aspects of an organism's physiology, not least the mental and moral domain in the case of humans. His belief in the importance of acquired characters came not just from his studies of animals, but also from his early work as a botanist.

Natural history in the eighteenth and nineteenth centuries was often praised in its "applied" forms on the basis of its cultural and agricultural utility in France.[79] Many zoologists and botanists were therefore interested in how the manipulation of the natural world could serve various political and economic ends. For example, working alongside Buffon, André Thouin (1747–1824), the longtime head gardener at the Jardin/Muséum, established extensive correspondence networks beginning in the early 1770s that enabled the importation of exotic plants whose favorable characteristics might enrich French natural wealth.[80] A member of the Parisian Société d'Agriculture in addition to his post at the Jardin, Thouin hoped that by acclimatizing foreign plants to the Parisian environment, he could revitalize French agriculture. This was a project that carried moral significance in both the Société and the Jardin, as

---

[79] Michael A. Osborne, "Applied Natural History and Utilitarian Ideals: 'Jacobin Science' at the Muséum d'Histoire Naturelle, 1789–1870," in Ragen & Williams (eds.), *Re-creating Authority in Revolutionary France* (New Brunswick: Rutgers University Press, 1992), pp. 125–129.

[80] Spary, *Utopia's Garden* (2000), p. 123.

Rousseauist writers in particular argued that France needed "massive moral reform" and suggested that it could come about via a knowledge of natural history applied to agriculture.[81]

In addition to their professional relationship through the Jardin, Thouin had a close personal relationship with Lamarck: he served as godfather to his namesake, Lamarck's son André (1781–1817), and was later one of the four naturalists who witnessed Lamarck's will in 1822.[82] His conviction in the morally curative power of natural history and agriculture was therefore an important part of Lamarck's social and intellectual milieu. Just before the Revolution, Thouin presented several papers to the Société Royale d'Agriculture in Paris in which he discussed the effects of air and soil quality on the moral and physical condition of society.[83] Similar concerns motivated Lamarck's meteorological investigations, which he offered for use by doctors in addition to farmers and mariners.[84]

Several decades later, writing to Thomas Jefferson, Thouin requested "further details on the moral and physical effects produced by the donation of objects of rural economy and agricultural instruction that you made to the Savage peoples" encountered on voyages Jefferson had ordered to the South Sea.[85] As this letter suggests, ideas about the roles of agriculture and natural history in moral reform and regeneration were shaped by the observations European

---

[81] Spary, *Utopia's Garden* (2000), p. 125.

[82] "Testament de Jean-Baptiste-Pierre-Antoine de Lamarck" (9 fev. 1822). MC/ET/XXXVIII/921. Minutes du notaire Pierre Louveau. Salle des inventaires virtuelle des Archives nationales de France; accessed 18 Feb. 2021. The other witnesses were the botanist René Desfontaines (1750–1833), Geoffroy, and the entomologist Pierre André Latreille (1762–1833).

[83] Spary, *Utopia's Garden* (2000), pp. 139–41.

[84] For example, see Lamarck, *Annuaire météorologique pour l'an XI* (Paris: Maillard, 1802), cover.

[85] "Letter to Thomas Jefferson from André Thouin, 16 June 1808," *Founders Online*, National Archives, https://founders.archives.gov/documents/Jefferson/99-01-02-8165.

colonists made of indigenous peoples. For example, Lamarck's mentor the comte de Buffon (1707–1788), who was the intendant at the Jardin du Roi from 1739 until his death, was particularly interested in the natural history of the human species as an explanation for variation among humans. He believed that non-European peoples had emerged as a result of the degenerative effects of foreign climates, airs, and atmospheres.

However, Buffon considered such environmental factors to be hyperlocalized, and also turned his naturalist's gaze toward the French at home. Drawing in part from Hippocratic medicine, particularly in his emphasis on the effects of the "non-naturals" (airs, diet, motion and rest, sleep, evacuation of waste, and passions), he investigated these environmental factors as causes of inherited acquired changes. At his estate in Montbard, for example, he engaged in "marriage broking" of the peasants, hypothesizing that such 'cross-breeding,' even within a single canton, could reverse the degenerative effects of nature.[86] The topic of racial mixing (*métissage*) was eventually taken up by numerous revolutionaries, including Cabanis and the abbé Sieyès (1748–1846), who considered various forms of selective 'breeding' to be promising for the regeneration of the French population.[87]

William Max Nelson has referred to such discourses as a "new anthropological approach" by which savants drew from colonial methods of observing indigenous peoples and applied them within France, focusing especially on rural peasants.[88] Statistical surveys of populations and

---

[86] Spary, *Utopia's Garden* (2000), p. 130.

[87] William Max Nelson, "Colonizing France: Revolutionary Regeneration and the First French Empire," in Desan, Hunt, and Nelson (eds.), *The French Revolution in Global Perspective* (Ithaca: Cornell University Press, 2013), p. 81.

[88] Nelson, "Colonizing France" (2013), p. 77.

commerce had been collected in French colonies since the beginning of the eighteenth century, and under the Directory in particular they were increasingly deployed to study local variations in climate and culture in France.[89] New anthropological groups like the Society of the Observers of Man, founded in 1800 and boasting Lamarck as a member, took particular interest in the populations and climates of the provinces. With a membership composed of all manner of naturalists and philosophes, the Society sought a Buffonian "*Histoire naturelle de l'homme*" that, as a moral science, would contribute to human welfare and social progress.[90] This project drew in part from the sensationalist and monistic view of man espoused by Cabanis and the Idéologues.[91] However, as Jean-Luc Chappey pointed out in *La Société des observateurs de l'homme (1799–1804): Des Anthropologues au temps de Bonaparte* (Paris: Société des études robespierristes, 2002), interest in a "science of man" characterized numerous political and religious factions. Indeed, the Society included a robust Catholic wing, accounting for so much of its membership that when they abandoned it in favor of Napoleon's new conservative regime, their absence contributed greatly to its demise in 1804.

Nevertheless French naturalists, physicians, and social reformers throughout the early nineteenth century remained convinced of the intimate links between people and their environments, and Lamarck's propensity to offer his own prescriptions for the social body shows that he was aware of the potential utility of these *rapports*, particularly in education and

---

[89] Nelson, "Colonizing France" (2013), pp. 83–4.

[90] Benjamin Kilborne, "Anthropological thought in the wake of the French Revolution: la Société des observateurs de l'homme," *European Journal of Sociology*, (1982), p. 78.

[91] See Kilborne, "Anthropological thought in the wake of the French Revolution" (1982); see also George Stocking, "French Anthropology in 1800," *Race, Culture, and Evolution: Essays in the History of Anthropology* (Chicago: University of Chicago Press, 1968), esp. pp. 18–21.

government. For Lamarck, guiding and shaping society was perhaps the most important applied use for knowledge of the natural world, and this link turned on the capacity for voluntary action. This is not to say that all savants saw biological change as promising a better future for humanity. Indeed, even among those commonly identified as Idéologues, politics varied widely. As Cabanis's biographer Martin Staum has argued: "Cabanis's heirs did not all extend the belief in individual perfectibility to a vision of a more enlightened society."[92] To understand the range of ideas about social progress and regress, it is also necessary to take note of debates in the medical world, in which ideas about social reform were closely linked with the study of physiology and the human species. This linkage made its way into Lamarck's system most overtly in his citations of Cabanis.[93]

i. Physiology, medicine, and inheritance

For Lamarck, the link between nature and physiological change was quite tangible. For example, when he argued in *Philosophie* that living bodies were literally shaped by visible and subtle fluids flowing into the cellular tissue from the environment, he was in effect

---

[92] Martin S. Staum, *Cabanis: Enlightenment and Medical Philosophy in the French Revolution* (New Jersey: Princeton University Press, 1980), p. 265.

[93] Cabanis's evolutionary ideas were not published until 1802, the same year as Lamarck's first evolutionary work, the *Recherches sur l'organisation des corps vivans*. As Richards has pointed out, it is therefore possible that in these evolutionary works it was Lamarck who influenced Cabanis, or that both Lamarck and Cabanis were drawing from some third source. However, on the politics of physiology and sensationalism, Lamarck's ideas more clearly followed Cabanis's, especially in *Philosophie zoologique* and his succeeding texts. See Richards, "The Influence of the Sensationalist Tradition in Early Theories of the Evolution of Behavior," *Journal of the History of Ideas*, (1979), pp. 93–4; and Richards, "The Emergence of Evolutionary Biology of Behaviour in the Early Nineteenth Century," *British Journal for the History of Science*, (1982), pp. 262–3. In particular, Lamarck adapted Cabanis's sensationalist evolutionary account of instinctive behavior to explain how sufficiently intelligent species could gain the capacity for voluntary action; see Richards, "The Emergence of Evolutionary Biology in the Early Nineteenth Century" (1982), pp. 269–71.

presenting his theory of the mechanics of the organism-environment relationship.[94] In his telling, the consonance between a body and its milieu was simply a matter of physics. In this way his ideas resembled Cabanis's.

But for Cabanis, physiology was also an explicitly political endeavor, one that naturalized his extensive program of social reform by subordinating ethics and metaphysics to the physical study of humanity as a part of nature.[95] Like the eighteenth-century agricultural reformers at the Jardin, Cabanis did not just identify a correlation between physical and moral phenomena; he suggested that French society could be reformed by management of the physical. Cabanis's belief in the importance of physiological studies for social reform hinged on his materialist-monist view of the mind-body relationship. If the mind had no claim to independence from the body, then it was the physician-physiologist who could offer the greatest insights into morality and society, as mental phenomena depended on the physical domain. The physician thus became qualified to make pronouncements upon ethics, political science, and social organization by virtue of his expert knowledge of the mental physiology.[96]

This was not the only way in which French doctors expanded the authority and prestige of medicine during the late eighteenth and early nineteenth centuries. For example, in the 1780s–90s the belief that physicians could diagnose social ills in addition to treating individual patients had spawned a genre of "medical journalism."[97] For some, the Revolution itself was a curative

---

[94] See Lamarck, *Zoological Philosophy* (1914), pp. 188–9.

[95] L.S. Jacyna, "Medical Science and Moral Science," *History of Science*, (1987), p. 114.

[96] Jacyna, "Medical Science and Moral Science" (1987), p. 115.

[97] Nina Rattner Gelbart, "The French Revolution as Medical Event: The Journalistic Gaze," *History of European Ideas*, (1989), p. 417.

event. In 1789, the alienist (and later Idéologue) Philippe Pinel (1745–1826), in his fifth year as editor of the weekly *Gazette du Santé*, published a November issue that claimed that nervous maladies had all but disappeared in Paris since the beginning of the Revolution, "doubtless because the indolent and apathetic sloth of the rich gave way to reborn caring and to agitations capable of engaging the activity of the soul … Politics has thus come to the rescue of medicine."[98]

This rosy prognostication proved premature, but Cabanis, among others, continued to view medicine and politics as inherently linked. For Cabanis it was fairer to say that medicine had to come to the rescue of politics, guiding law and virtuous education on top of its capacity to physically improve individual patients.[99] Lamarck's citations of Cabanis sometimes challenged particular physiological details, but the two men shared the underlying belief that knowledge of humans as physical organisms was the key to moral reform and regeneration of individuals and their societies. From airs to location to habits, any environmental factor could contribute to health or illness in the body, which imbued knowledge of the natural world with profound medical, and therefore moral, and political significance.[100] This materialist turn was prevalent in medicine during the eighteenth century, and scientific theories about the influence of the natural world on organisms expanded French doctors' areas of therapeutic expertise and control.[101]

---

[98] Quoted in Gelbart, "The French Revolution as Medical Event" (1989), p. 419.

[99] Jacyna, "Medical Science and Moral Science" (1987), p. 118.

[100] Locations and climatic factors could also cause or cure specific disease states, as in the cases of nostalgia and the mesmerist craze; see Appendix B.

[101] Nye, *Crime, Madness, & Politics* (1984), p. 41.

By the late 1820s, physicians were also embracing the pursuit of "public hygiene and legal medicine," which encompassed the reform of public institutions, management of the environment, and even advising the authorities on thorny moral questions in criminal issues.[102] For example, the prospectus of the *Annales d'hygiène publique et de médecine légale*, founded in 1829, proclaimed that "medicine does not have as its sole object the study and cure of illness, it also has a close rapport with social organization; it may aid the legislator in the preparation of laws, it often enlightens the magistrate in their application, and it invariably looks after, along with the administration, the maintenance of public health."[103] As doctors sought professional prestige and institutional sites of practice, medicine became increasingly concerned with the social body, not just the individual patient.[104]

Furthermore, doctors had long been interested in patterns of familial resemblance and inheritance. The historian Carlos López-Beltrán has argued that the concept of biological heredity was solidified in the medical world; the term "hereditary" first appeared in European dictionaries and encyclopedias in the early eighteenth century in reference to the inheritance of diseases.[105] French physicians were particularly interested in these hereditary patterns of disease

---

[102] Williams, *The Physical and the Moral* (1994), pp. 152–4.

[103] Quoted in Nye, *Crime, Madness, & Politics in Modern France* (1984), p. 43.

[104] These two functions, however, were not necessarily carried out by the same individuals: an 1803 law differentiated doctors who held the *doctorat d'état* from Paris, Strasbourg, or Montpellier from those who held the lesser *officier de santé* and had studied in regional medical schools. Robert A. Nye argued that this latter group functioned as practitioners for rural clients, but were unlikely to harbor grand ambitions for the medical profession. Nye, *Crime, Madness, & Politics* (1984), p. 38.

[105] Carlos López-Beltrán, "Forging Heredity: From Metaphor to Cause, a Reification Story," *Studies in the History and Philosophy of Science*, (1994), p. 221. Theories of generation remained split between epigenetic and preformationist views, and the hereditary theory of the eighteenth century had an emphasis on physiological resemblance. See Jacques Roger, *The Life Sciences in Eighteenth-Century French Thought* (Stanford: Stanford University Press, [1963], 1997).

transmission, and in 1788 the Royal Academy of Medicine even sponsored an essay competition on the subject.[106] The fixation on hereditarian theories only increased following the Revolution, and doctors sought to explain insanity and other social ills in addition to discrete diseases like tuberculosis and scrofula.[107] It was in this context that the naturalist Joseph-Julien Virey (1775–1846), who had been trained as a physician, formulated his theory of fixed physiological types during the 1810s–1820s.

Like Lamarck, Virey staked his social commentary on the claim that as an observer of the natural world, he had special insight into the kinds of social issues traditionally left to political theorists.[108] His theory of physiological types posited that many vices and pathologies were inherited and therefore innate to the individual, a 'fixist' tendency that became increasingly prominent within hygienic science during the 1820s–30s and often led to the belief that inherited dispositions and diseases contributed to the degeneration of the human species.[109] Virey was far from the first physician to express this sort of concern or to propose addressing it by selective 'breeding,' a process doctors should oversee and direct.[110]

Hereditarian theories did not always center the threat of degeneration. For example, Sean Quinlan has pointed out the proliferation of self-help manuals that purported to teach readers

---

[106] See López-Beltrán, "Forging Heredity" (1994), p. 229; and Sean Quinlan, "Heredity, reproduction, and perfectibility in revolutionary and Napoleonic France, 1789–1815," *Endeavor*, (2010), p. 146.

[107] López-Beltrán, "Forging Heredity" (1994), p. 231. On the links between insanity, illness, and social deviance, see Nye, *Crime, Madness, & Politics in Modern France* (1984). On the psychiatric profession and the inheritance of insanity, see Ian R. Dowbiggin, *Inheriting Madness: Professionalization and Psychiatric Knowledge in Nineteenth-Century France* (Berkeley: University of California Press, 1991).

[108] Corsi, *The Age of Lamarck* (1988), pp. 187–8.

[109] Williams, *The Physical and the Moral* (1994), pp. 154–155.

[110] Sean Quinlan, "Heredity, reproduction, and perfectibility in revolutionary and Napoleonic France, 1789–1815," *Endeavour*, (2010), p. 147).

how to ensure "gifted, healthy, and beautiful children;" the genre was especially popular in the early Napoleonic years.[111] Addressing the environmental factors could also ensure a positive future, not just prevent a negative one. Even during the Terror, the philosophe and legislator A.-N. de Caritat de Condorcet (1743–94) had written of his hopes for the human race to reach perfection via proper scientific and medical management of the physical environment.[112] Like Buffon, Condorcet generally focused on the potential *positive* outcomes for society of properly managed inheritance and hygienic medicine, as opposed to the later tendency to focus on the threat of inherited pathologies. But lurking behind even Condorcet's utopian dreams was the implication that the health of an entire society might be threatened if the wrong characteristics took hold of the species by acquisition or inheritance. The hope that humans could direct their own species development was always accompanied by the fear of what might happen if they failed to do so.

iii. Sensation and ideology

Cabanis drew his ideas about perfecting the human species in large part from the study of stock breeding, and inheritance thus played an important role in his thought.[113] However, in his formulation of the inheritance of acquired characters, the environmental factors were also crucial. Cabanis's empiricist thought drew from Locke's sensationalist argument that sensory

---

[111] Quinlan, "Heredity, reproduction, and perfectibility in revolutionary and Napoleonic France, 1789–1815" (2010), pp. 147–9.

[112] Quinlan, "Heredity, reproduction, and perfectibility in revolutionary and Napoleonic France, 1789–1815" (2010) p. 144; and Richards, "The Emergence of Evolutionary Biology of Behaviour in the Early Nineteenth Century" (1982), pp. 247–8.

[113] Richards, "The Emergence of Evolutionary Biology of Behaviour in the Early Nineteenth Century" (1982), p. 249.

impressions were the origins of all ideas, and from Destutt de Tracy's (1754–1836) science of Ideology, according to which all human ideas could be studied as phenomena of sensibility.[114] The sensationalist influence shaped Cabanis's particular methods of perfecting humans and human society: Ideology assumed the existence of a link between the moral and the physical that allowed each to exert an effect on the other, and one of the consequences was that the environment could profoundly change the human species. Thus for Cabanis, improving humanity required not just reproductive hygiene via the use of 'breeding' techniques, but also management of people's surroundings and sensory stimulants.

Cabanis acknowledged the importance of many different environmental factors, including age, sex, temperament, and climate. Underlying all of these concerns was his conviction that sensitivity was the ultimate cause of all ideas. It was thus important to carefully cultivate the sensory impressions people were to receive, especially sights and spectacles.[115] The natural world had a particularly important role to play: since the late eighteenth century, French natural historical writings, often styling themselves after Rousseau, had portrayed the contemplation of nature as a means by which people could morally better themselves. Indeed, the natural world was the source of moral sensibility in a dual sense: it provided spectacular sights that refined observers could gaze upon to cultivate their moral sense, and more literally it encompassed the

---

[114] Spary, *Utopia's Garden* (2000), p. 4.

[115] The emphasis on sight (and by extension blindness) was shared by many French savants in the eighteenth century, partly as a consequence of Lockean epistemology and the 'Molyneaux problem.' On Condillac's and Rousseau's associations of sight with self-development in their writings on educational reform, see Spary, *Utopia's Garden* (2000), p. 196. On the broader sensationalist tendency to equate blindness with moral solipsism and Cartesianism, see Jessica Riskin, *Science in the Age of Sensibility: The Sentimental Empiricists of the French Enlightenment* (Chicago: University of Chicago Press, 2002); see especially Chapter 2. See also William R. Paulson, *Enlightenment, Romanticism, and the Blind in France* (New Jersey: Princeton University Press, 1987); and Mark Paterson, *Seeing with the Hands: Blindness, Vision, and Touch after Descartes* (Edinburgh: Edinburgh University Press, 2016).

material basis of the moral. To study the sensory origins of ideas was also to study the sensory origins of virtue and good citizenship.[116] Organizers of the extravagant Revolutionary festivals even invoked empiricist metaphors of the psyche as "soft wax" or "clay" to be "stamp[ed]" or "imprint[ed]."[117]

Trained as a physician, Cabanis was an influential medical reformer. His ideas about managing and reforming society were grounded on his physiological theories and were intended to effect moral change via the physical environment. This strategy included relatively straightforward measures, like providing hospital patients with clean, fresh air rather than cramped and dirty quarters. But Cabanis also argued for physicians to occupy a much larger role in society, including as advisers to educators and legislators. As he saw it, the physician's art was to improve upon nature's work, properly developing the faculties and even, eventually, creating new organs.[118] Thus where hereditarian theories could imply a certain inevitability of biological outcomes, Cabanis also emphasized the power of the prudent physician to attend to the happiness and perfection of the human race.

Cabanisian and monistic physiological theories, which framed thought as the result of organized matter, did become increasingly problematic after the Revolution, as they were associated with political and religious instability, materialism, and liberalism.[119] However, as Williams has pointed out, Ideology belonged to a much broader tradition of anthropological and

---

[116] Riskin, *Science in the Age of Sensibility* (2002), p. 256.

[117] Mona Ozouf, *Festivals and the French Revolution* (Massachussetts: Harvard University Press, 1988), p. 203.

[118] Staum, *Cabanis* (1980), p. 177.

[119] Jacyna, "Medical Science and Moral Science" (1987), pp. 129–31.

physiological medicine that persisted throughout the early nineteenth century, even as it became semantically fractured and mutated over time.[120] She identified four major characteristics of this tradition: a holistic view of medicine and personhood; the belief in intimate *rapports* between the moral and the physical; a social (eventually 'anthropological') construction of medicine; and sustained interest in discerning human 'types.'[121]

Lamarck's insistence that subjective phenomena could be investigated as the results of physiological events was thus only one particular configuration of an ongoing tendency within French naturalism to examine the intimate relations between the moral and the physical. He was not advancing an absurd argument or even an original one, but was working within the parameters of mainstream science. It is true that his particular intellectual influences were not always well-received: both Napoleon and the Restoration government took issue with the perceived liberalism of sensationalism and Ideology, eventually leading to the 1822 suppression of the Faculty of Medicine. And Pietro Corsi has argued that Lamarck's proposal, and then abandonment, of a new science of *biologie* should be understood with reference to Napoleon's dislike of materialism and atheism.[122] Still, elements of sensationalism persisted in medical and scientific studies, in part because they could be married with any number of political alignments —that is, medical and political sensationalism were not always fully cohesive.[123] One example of

---

[120] Williams, *The Physical and the Moral* (1994), pp. 12–13.

[121] Williams, *The Physical and the Moral* (1994), pp. 8–9.

[122] Pietro Corsi, "Biologie," in Corsi, Pietro, Jean Gayon, Gabriel Gohau, & Stéphane Tirard, *Lamarck, philosophe de la nature* (Paris: Presses Universitaires de France, 2006), pp. 58–59. See also John Farley, *The Spontaneous Generation Controversy From Descartes to Oparin* (Baltimore: Johns Hopkins University Press, 1977), pp. 42–44.

[123] Jacyna, "Medical Science and Moral Science" (1987), p. 134.

this in Lamarck's work is his citations of Cabanis, whom he named fourteen times throughout *Philosophie*.[124] However, he also included thirteen references by name to Cabanis's much more conservative disciple Anthelme Richerand (1779–1840), a 'second-generation Idéologue' who eventually slid into a reactionary ultraroyalist stance.[125] On certain points Lamarck even seems to have read Cabanis via Richerand, rather than directly.[126] Nevertheless, like Cabanis, Lamarck was thoroughly persuaded that species development and organic variation were of the utmost importance for social welfare, directing his attention to factors including the climate, temperature, atmosphere, place, manner of living, and daily actions and habits.[127]

Jordanova has pointed out the Idéologue influence in Lamarck's attempts to develop a 'science of man,' and suggested that he likely shared "liberal and anti-authoritarian" views with many Idéologues.[128] However, Lamarck's own political leanings are difficult to pin down. Snait Gissis has traced some of his social and scientific links to Revolutionaries and politically involved naturalists.[129] But she also noted that he was not one of the more explicitly political

---

[124] On the influence of Cabanis on Lamarck's physiology see Richards, "The Influence of Sensationalist Tradition on Early Theories of the Evolution of Behaviour" (1979), pp. 85–105; Richards, "The Emergence of Evolutionary Biology of Behaviour in the Early Nineteenth Century" (1982), pp. 241–80; and Baertschi, "Diderot, Cabanis, and Lamarck on Psycho-Physical Causality" (2005), pp. 451–63.

[125] Staum, *Cabanis* (1980), pp. 151–3. Richerand radicalized throughout his life, and was more moderate when Lamarck cited him in 1809. Still, the point remains that sensationalism, and aspects of Cabanisian thought in particular, were both widely and indirectly disseminated throughout the early nineteenth century, taking on varying political and social significance.

[126] Richards, "The Emergence of Evolutionary Biology of Behaviour in the Early Nineteenth Century" (1982) p. 261.

[127] Lamarck, *Philosophie zoologique*, (1809), Vol I., p. 238.

[128] Ludmilla Jordanova, *Lamarck* (Oxford: Oxford University Press, 1984), pp. 87–88; 98–107.

[129] Gissis, "Interactions Between Social and Biological Thinking" (2009), pp. 254–267.

savants, and indeed, assessing the strength of his Republican convictions, Burkhardt characterized him as merely "politically prudent."[130]

Lamarck was certainly interested in the social and political aspects of humankind insofar as he believed he could ground them in the positive facts of natural history. He also expressed that humanity's happiness and well-being would be most improved if everyone were of roughly equal intelligence, and he saw this issue as following directly from civil society's tendency toward divided labor. All of this suggests that he was convinced of a need for social reform, and he thought naturalists like himself had valuable contributions to make in any such effort. However, he did not fashion himself a legislator like Condorcet or a doctor-reformer like Cabanis.[131] Rather, he seems to have been more or less in agreement with some basic tenets of a moderate, reform-minded liberalism. But as a *Naturaliste philosophe*, he placed more emphasis on his argument that politics ought to be founded on naturalism than he did on actually explicating a coherent political program.

Conclusion

In this thesis I have examined the role of the will in Jean-Baptiste Lamarck's transformist theory, and shown that he was not merely trying to explicate an evolutionary theory of how species had come to exist in their present forms. Rather, we understand Lamarck best by locating him in the context of national concerns about social progress and degeneration. Lamarck

---

[130] Burkhardt, *Spirit of System* (1977), p. 37.

[131] On Cabanis's role as a medical reformer, see Staum, *Cabanis* (1980), especially chapter 10; and Dora Weiner, *The Citizen-Patient in Revolutionary and Imperial Paris* (Baltimore: Johns Hopkins University Press, 2002).

believed that the current state of human society was part of the natural history of the human species, making social commentary a legitimate part of the naturalist's work. Further, social change and reform would be part of the future development of the species, giving humans a genuine ability to direct their own evolution. This aspect of Lamarck's thought drew not only from natural historical debates about species transformation, but also from medicine, physiology, and empiricist epistemology. While it was certainly not his intention to attribute all species transformation to will or desire, the history and physiology of the will had moral and political significance. This fact has often been obscured by Cuvier's caricature of voluntary species change, which advanced a seemingly apolitical critique that portrayed Lamarck's ideas as scientifically unsound rather than engaging with their deeper social context and meaning. While Cuvier was certainly not the only person to propagate Lamarck's ideas, his *éloge* retained a notable role in the historical understanding of Lamarck—partly because of his influence on Lyell and eventually Darwin. In truth, Cuvier's explanation of the place of the will in Lamarck's thought had little to do with Lamarck's actual conception of it, which was formulated in the context of an intellectual environment in which the idea of self-directed change was neither absurd nor even particularly unusual.

In Part III I have explored some of this context, especially the influence of Rousseauian political philosophy and national concerns about degeneration and regeneration, which remained prevalent in medicine and hygiene throughout the nineteenth century. While species transformation was an important part of Lamarck's thought, I believe that he should be understood as much more than an early evolutionist. His interest in the role of self-direction in species transformation was part of a broader vision of the *rapports* between the physical and the

moral. Like Cabanis, Lamarck considered these *rapports* to include not just the effects of the physical on the moral, but also vice versa—and it was by acts of will that the moral domain could affect the physical one. This aspect of Lamarck's thought drew from the prevailing tendency to link social change with the capacity to change and direct the natural world. His interest in human evolution was especially driven by the belief that the biological improvement of the human species was key to the moral and physical regeneration of French society.

Understanding the role of voluntary action and self-directed change in Lamarck's system thus requires a contextualist approach, not just a close reading of Lamarck's own works. Lamarck's *biologie* was always bound up with his interest in social change, regeneration, and moral agency, and he was far from alone in seeing such links between the history of nature and the future of society. The capacity to act by will rather than instinct gave humanity immense power over the natural world—including the human species itself. Natural and social transformation produced humans as moral agents endowed with free will, and humans could in turn change their own bodies and environments, continually re-forming and re-creating society.

Appendix A: Facts and theories in European science

Navigating the multifaceted terrain of natural historical practice, Lamarck styled himself a *Naturaliste philosophe*, a title that led Burkhardt (1970) to argue that he was chafing against the "over-emphasis in contemporary science upon the importance of facts and facts alone."[132] In this framing, Lamarck's problem was that he insisted on clinging to an outmoded Enlightenment style of naturalism that his peers were eager to dispose of by the turn of the century. Certainly this critique is consonant with the one Lyell offered in his *Principles of Geology*, in which he stressed the absence of "positive facts," "well-authenticated facts," and "positive data" at critical junctures in Lamarck's argument.[133] Cuvier, too, had long used the demand for "positive facts" in science to criticize his intellectual opponents, including Lamarck.[134] In his debates with Cuvier during 1830, the zoologist Étienne Geoffroy St.-Hilaire (1772–1844), however, took the opposite approach, reflecting a sea-change in European science away from an emphasis upon mere facts, and toward a greater appreciation for those skilled philosophical naturalists who could derive from these collections the generalized laws of nature. Geoffroy thus presented himself as the vanguard of a reformed scientific movement that would shift attention from Cuvier's smaller

---

[132] Richard Burkhardt, "Lamarck, Evolution, and the Politics of Science," *Journal of the History of Biology*, (Autumn 1970), p. 285.

[133] Lyell, *Principles of Geology*, Vol. II (1832), pp. 1–22; see especially pp. 10–13. Readers may note the irony in this charge given that, as Alistair Sponsel has shown in his recent account of Lyell in *Darwin's Evolving Identity* (Chicago: University of Chicago Press, 2018), Lyell himself was far from immune to building grand theories on the basis of what many considered to be too few facts.

[134] Dorinda Outram, *Georges Cuvier: Vocation, Science, and Authority in Post-Revolutionary France* (Manchester: Manchester University Press, 1984), pp. 128–32. This shift away from an inductive science based on the mere observation of 'facts' to the derivation of generalized laws is characteristic of a broader epistemic shift in European science, as noted in William Whewell's *Philosophy of the Inductive Sciences* (Cambridge: Cambridge University Press, [1840], 2014) in England, for instance, and commented upon by Philip F. Rehbock in his now classic *The Philosophical Naturalists: Themes in Early Nineteenth-Century British Biology* (Madison: University of Wisconsin Press, 1983).

facts to the higher philosophical principles.[135] However, to those who sided with Cuvier, Geoffroy's repeated claim of allegiance to Lamarck only reinforced the perception that Lamarck was too speculative, his fanciful theories extending beyond the explanatory power of the facts and beyond his true areas of expertise: botany and conchology.

But throughout Lamarck's career, claims to be uniquely sensitive to facts and observations were made by savants on virtually all sides of any given issue, and they cannot always be taken at face value. Lamarck himself directed a similar criticism toward Lavoisierian chemistry in the *Hydrogéologie* (1802), claiming that unlike the new chemists, he would consider all relevant facts before developing any systems or hypotheses. This was a typical posture in his transformist arguments as well: for example, *Recherches* (1802) opened with the enjoinder "to gather the observed facts and use them to discover unknown truths,"[136] and the preface to *Philosophie* (1809) stressed that facts and observations formed the basis of his theories.[137] Similar claims appeared in the preface to *Histoire* (1815–22) and in *Système* (1820).[138] In the first issue of his *Journal d'histoire naturelle*, published in 1792, he asserted that the *rapports* between species and genera were "solid knowledge" because they depended on

---

[135] Corsi, "The Revolutions of Evolution" (2011), p. 115; see also Toby Appel, *The Cuvier-Geoffroy Debate: French Biology in the Decades Before Darwin* (Oxford: Oxford University Press, 1987).

[136] Lamarck, *Recherches sur l'organisation des corps vivans* (1802), p. iv.

[137] Lamarck, *Zoological Philosophy* (1914), pp. 7–8.

[138] For example, see Lamarck, *Histoire naturelle des animaux sans vertèbres* (1815–1822), "Avertissement," pp. i–xvi; and Lamarck, *Système analytique* (1820), "Discours Préliminaire," pp. 1–6. Lamarck frequently reproduced passages from his own earlier works, sometimes verbatim and sometimes with minor revisions or additions.

observation alone: "because true *rapports* are positive facts, no one could call them into doubt."[139]

As Burkhardt has pointed out, such methodological claims did not necessarily correspond with Lamarck's own way of practicing science.[140] Still, they complicate the idea that he was uniquely wedded to the anachronistic "systems" of Enlightenment natural philosophy. In fact, throughout the eighteenth century the phrase "spirit of system" had been a favorite epithet among savants, "so popular and effective that everyone, on all sides of any given dispute, used it against everyone else."[141] Cuvier's supposedly analytical, empirical science has been contrasted with the more synthetic, philosophical one favored during the Enlightenment.[142] But as Martin Rudwick has pointed out, Cuvier himself used the term 'facts' with nuance, permitting some low-level theorizing as well as the interpretation, or "reading," of fossils in his paleontological work.[143] 'Analytical' and 'synthetic' science were not as disparate as they may first appear.

In light of these considerations, even Lamarck's more incredible ideas should not be dismissed as the products of an overactive imagination or an antiquated focus on theories over facts.[144] Nor did they relegate him to the periphery of the savant world.

---

[139] Lamarck, "Sur l'étude des rapports naturels," in Lamarck, Bruguière, Olivier, Haüy, & Pelletier (eds.), *Journal d'histoire naturelle* (1792), pp. 365–7.

[140] Burkhardt, *Spirit of System* (1977), p. 210.

[141] Riskin, *Science in the Age of Sensibility* (2002), p. 12.

[142] See e.g. Appel, *The Cuvier-Geoffroy Debate* (1987), pp. 6–7.

[143] Rudwick, *Georges Cuvier, Fossil Bones, and Geological Catastrophes: New Translations and Interpretations of the Primary Texts* (Chicago: University of Chicago Press, 1997); see especially chapters 10 and 15.

[144] See Cuvier, "Éloge de Lamarck," (1861), pp. 179–210.

Appendix B: Climatic medicine, mesmerism, and nostalgia

In addition to 'degeneration,' climatic influences could cause specific disease states. Consumption of a new or strange diet might disagree with one's constitution, and a place's winds or airs could be especially hostile to newcomers and the displaced. Such beliefs coalesced in the disease state of nostalgia, first described in the seventeenth century as an affliction resulting from a spatial displacement that removed the sufferer from the environment they had grown accustomed to. In France it was most associated with soldiers: throughout the eighteenth century, French military doctors had reported that soldiers under their care, displaced from their native lands, were suffering from a pathological *mal du pays*, which could often be alleviated only by a return home.[145] The diagnosis of nostalgia thus resulted from a particular contact between the naturalist's study of the environment and the doctor's curative mission.

Such a linkage can also be seen in the mesmerism of the 1780s, which purported to control, especially for medicinal purposes, the magnetic fluid that Mesmer claimed penetrated and surrounded all bodies.[146] Mesmerism was never widely accepted by the scientific academies, but it was popular nonetheless, part of the wider trend of turning to natural historical discourses in service of the health of both society and the individual patient. Atmospheric influences were of the utmost importance in the cultivation of a healthy, revitalized nation. The popularity of mesmerism, and the scientific prestige of nostalgia, are indicative of some of the prevailing

---

[145] Thomas Dodman, *Homesick Epoch: Dying of Nostalgia in Post-Revolutionary France* (PhD diss., 2011), p. 123. See also Marcel Reinhard, "Nostalgie et service militaire pendant la Révolution" *Annales historiques de la Révolution française*, (1958), pp. 1–15.

[146] Robert Darnton, *Mesmerism and the End of the Enlightenment in France* (Massachusetts: Harvard University Press, 1968), pp. 3–4.

natural historical beliefs driving Lamarck's turn in the 1790s to studies of meteorology and weather.

In fact, during this period the new Republican government became particularly invested in the notion of a cohesive national French identity, problematizing the kinds of hyperlocal attachments that might produce nostalgia.[147] Rural young soldiers were considered particularly vulnerable to the disease due to their strong regional identities and local dialects, and Bretons were notoriously susceptible, according to military doctors.[148] Interest in the political idea of French identity was simultaneously spawning a new body of what William Max Nelson called "internal ethnographic literature," which replicated the methods and tropes of colonial travelogues within the provinces.[149] Travel writers and revolutionaries pointed to local variations in climate, temperature, language, and customs to explain both the physical and moral characteristics of rural French peasants.[150]

Thus Lamarck's argument in *Philosophie* that living bodies were (literally) shaped by visible and subtle fluids flowing into the cellular tissue from the environment was a naturalist's explanation of an already widely accepted sociological phenomenon.[151] Moreover, his physical and geological views were themselves indebted to a tangle of natural and moral philosophical ideas. Fluids were commonly invoked in natural philosophy in the eighteenth century, from fire

---

[147] Lisa O'Sullivan, "The Time and Place of Nostalgia: Re-situating a French Disease" *Journal of the History of Medicine and Allied Sciences*, (2012), p. 629.

[148] O'Sullivan, "The Time and Place of Nostalgia" (2012), p. 628.

[149] Nelson, "Colonizing France" (2013), pp. 75–6.

[150] Nelson, "Colonizing France" (2013), p. 77.

[151] See Lamarck, *Zoological Philosophy* (1914), pp. 188–9.

and gravity to light and electricity, and physiologists inspired by Newton's theory of vision proposed that all ideas resulted from the physical impressions left on the nervous system by external objects.[152] In the 1780s, the mesmerists had even attached 'mesmeric fluid' to a conception of natural law as both a physical and a normative order—a derivation of morality from nature.[153] Notwithstanding the 1784 royal commission report blaming the reactions of mesmeric patients on overactive imaginations, mesmerism was immensely popular, in no small part due to the widespread fascination with scientific demonstrations and spectacles. The idea that 'subtle fluids' might conjoin the moral and the physical domains was not a fanciful invention of Lamarck's; it drew from a number of plausible natural philosophical beliefs in the eighteenth century.

Unlike mesmerism, nostalgia did manage to secure the veneer of scientific respectability. By the early nineteenth century, mainstream medical Ideologue writers explicitly linked it to environmental and climatic concerns, arguing that it was the result of a failure to properly acclimatize soldiers to their new landscapes.[154] In this the Ideologues were genuinely influenced by the neo-Hippocratic vitalist thought developed in Montpellier during the Enlightenment and exported to Paris as part of the landscape of anthropological medicine.[155] But they also sought to legitimate their analytic method by invoking Hippocrates, thus anchoring themselves to a medical tradition that claimed ancient Greek heritage—the medical analogue to the revolutionary

---

[152] Riskin, *Science in the Age of Sensibility* (2002), p. 27.

[153] Darnton, *Mesmerism and the End of the Enlightenment in France* (1968), p. 113.

[154] O'Sullivan, "The Time and Place of Nostalgia" (2012), pp. 635–6.

[155] Williams, *The Physical and the Moral* (1994), p. 74.

political tendency to appeal to Greco-Roman history.[156] In fact, the name of Hippocrates had long been a popular one, invoked in numerous and varying medical discourses. The mesmerists had even claimed in the 1780s to offer a return to "natural" Hippocratic medicine and the idealized vision of primitive human nature they drew from Rousseau's philosophy.[157] Cabanis's *Coup d'oeil sur les révolutions et sur la réforme de la médecine* (1804) and Pinel's *Nosographie philosophique* (1798), on the other hand, both praised Hippocrates for a method of rigorous observation that they proposed as a corrective to the dry, scholastic 'textbook medicine' favored by the old authorities.[158]

In *Lamarck* (1984), Ludmilla Jordanova identified some of the same throughlines I have discussed here, connecting Hippocratic climatic medicine and the Lockean-Condillacian epistemological tradition to Lamarck's interest in organisms' milieux.[159] However, while Jordanova focused on the prevalence of these theories during the eighteenth century, the social diagnostics of the Ideologues continued well into the nineteenth century, and Williams has argued that the larger tradition they belonged to continued to exert influence in French social

---

[156] George Rosen, "The Philosophy of Ideology and the Emergence of Modern Medicine in France" *Bulletin of the History of Medicine*, (1946), p. 335.

[157] Darnton, *Mesmerism and the End of the Enlightenment in France* (1968), p. 116.

[158] Williams, *The Physical and the Moral* (1994), p. 79. The English physician Thomas Sydenham (1624–1689) had similarly claimed allegiance to a practice-oriented Hippocratic medical tradition, and his work was synthesized with Paracelsian "chymistry" in the early eighteenth century by Herman Boerhaave (1668–1738). However, while he taught almost 2,000 medical students from across Europe, Boerhaave had little influence over the Paris medical school, and Montpellier in the eighteenth century is generally associated more closely with his rival Georg Ernst Stahl (1659–1734). See John H. Zammito, *The Gestation of German Biology: Philosophy and Physiology from Stahl to Schelling* (Chicago: University of Chicago Press, 2018), pp. 6–7.

[159] Jordanova, *Lamarck* (1984), pp. 58–59.

sciences even after 1850.[160] So commonplace was the association of airs and health that it appeared even in Cuvier's *éloge*: Lamarck's daughter, he reported, had spent so long indoors caring for her father that "the first time she went outside, she was incommoded by the free air, having long lost use of it."[161] Mesmerism, too, was intermittently revived throughout the first three decades of the nineteenth century, including by Joseph Philippe François Deleuze (1753–1835), employed since 1795 as an assistant-naturalist at the Muséum and a contemporary historian of the institution. The mesmerists proved such a nuisance that the Academy of Medicine began a new series of investigations in 1825.[162]

Ironically, while Cabanis considered the Hippocratic method important precisely because it directed the physician's attention to minute differences in temperament, occupation, climate, and so forth, Pinel decried what he referred to as "popular and humoral medicine," and invoked Hippocrates as a spectacular self-critic whose wisdom was not always to be found in his particular observations.[163] It was perhaps for this reason that nostalgia, which reeked of humoralism, was initially excluded from the *Nosographie philosophique*. Yet in 1821, Pinel himself wrote the "Nostalgie" article in the *Encyclopédie méthodique*, nostalgia having become an increasingly prevalent clinical term in the intervening period.[164] The near-constant state of war from 1792–1815 meant young medical men had frequently been drafted to military service,

---

[160] Williams, *The Physical and the Moral* (1994), pp. 244–272.

[161] Cuvier, "Éloge de Lamarck" (1861), p. 210.

[162] Darnton, *Mesmerism and the End of the Enlightenment in France* (1968), p. 141.

[163] Williams, *The Physical and the Moral* (1994), p. 79.

[164] Dodman, *Homesick Epoch* (2011), p. 96.

where the nostalgia diagnosis had long thrived,[165] and many of these same doctors returned home seeking the MD degree in the early 1800s after the army medical corps disintegrated under Napoleon's stewardship.[166] Such former Imperial army officers were responsible for a total of 11 French-language medical dissertations on nostalgia submitted between Paris, Montpellier, and Strasbourg from 1803 to 1815; another 17 were submitted (by students with and without military training) between 1825 and 1835.[167] In these dissertations the imagination's overwhelming power to reconstruct previous experiences explained the epidemic of nostalgia in the Napoleonic Wars: plagued by vivid perceptions of their far-away homes, soldiers were suffering both the physical and psychological effects of disordered imagination.[168]

---

[165] Dora Weiner, *The Citizen-Patient in Revolutionary and Imperial Paris* (Baltimore: Johns Hopkins University Press, 2002, p. 129); Dodman, *Homesick Epoch* (2011), p. 96.

[166] Weiner, *The Citizen-Patient in Revolutionary and Imperial Paris* (2002), pp. 285–9.

[167] Dodman, *Homesick Epoch* (2011), pp. 201–2.

[168] O'Sullivan, "The Time and Place of Nostalgia" (2012), p. 638.

References

Appel, Toby. *The Cuvier-Geoffroy Debate: French Biology in the Decades before Darwin*. Oxford: Oxford University Press, 1987.

Baertschi, Bernard. "Diderot, Cabanis and Lamarck on Psycho-Physical Causality." *History and Philosophy of the Life Sciences*, Vol. 27, No. 3/4, "Causation in Biomedical Sciences" (June 2005), 451–463. jstor.org/stable/23333904.

Balan, Bernard. "Premières recherches sur l'origine et la formation du concept d'économie animale." *Revue d'histoire des sciences*, Vol. 28, No. 4 (Oct. 1975), pp. 289–326. jstor.org/stable/23632090.

Barthélemy-Madaule, Madeleine. *Lamarck, the Mythical Precursor: A Study of the Relations between Science and Ideology*. Cambridge, Mass.: MIT Press, 1982.

Bartholomew, Michael. "Lyell and Evolution: An account of Lyell's response to the prospect of an evolutionary ancestry for man." *British Journal for the History of Science*, Vol. 6, No. 3 (June 1973), 261–303.

Bowler, Peter J. *The Non-Darwinian Revolution: Reinterpreting a Historical Myth*. Baltimore: The Johns Hopkins University Press, 1988.

Bulletin de la Société française d'histoire de la médecine, No. 8. Paris: Honoré Champion (1909), pp. 185–6. Digitized by the Bibliothèque interuniversitaire de Santé.

Burkhardt, Frederick et. al. (eds.). *The Correspondence of Charles Darwin*, Vol. 3. Cambridge: Cambridge University Press, 1987.

Burkhardt, Richard. "Lamarck, Evolution, and the Politics of Science." *Journal of the History of Biology*, Vol. 3, No. 2 (Autumn 1970), 275–298. https://www.jstor.org/stable/4330543

Burkhardt, Richard. *The Spirit of System: Lamarck and Evolutionary Biology*. Cambridge, M.A.: Harvard University Press, 1977.

Burlingame, Leslie J. "Lamarck's chemistry: The chemical revolution rejected." In: Woolf, Harry (Ed.). *The Analytic Spirit: Essays in the History of Science in Honor of Henry Guerlac*. Ithaca: Cornell University Press, 1981, pp. 64–81.

"Catalogue des livres de la bibliothèque de feu M. le chevalier J.B. Lamarck." Paris: Imprimerie et Fonderie de Fain (1830). Digitized by the Wellcome Library.

Chappey, Jean-Luc. *La Société des observateurs de l'homme (1799–1804): Des Anthropologues au temps de Bonaparte*. Paris: Société des études robespierristes, 2002.

Clark, Mary Ann, Matthew Douglas, & Jung Choi. *Biology 2e*. OpenStax, 2018.

Corsi, Pietro. *The Age of Lamarck: Evolutionary Theories in France, 1790–1830*. Berkeley, C.A: University of California Press, 1988.

Corsi, Pietro. "Before Darwin: Transformist Concepts in European Natural History." *Journal of the History of Biology*, Vol. 38, No. 1, "The 'Darwinian Revolution': Whether, What and Whose?" (Spring 2005), 67-83. jstor.com/stable/4331920.

Corsi, Pietro. "Biologie." In: Corsi, Pietro, Jean Gayon, Gabriel Gohau, & Stéphane Tirard. *Lamarck, philosophe de la nature*. Paris: Presses Universitaires de France, 2006, 37–64.

Corsi, Pietro. "The Revolutions of Evolution: Geoffroy and Lamarck, 1825–1840." *Bulletin du Musée D'Anthropologie Préhistorique de Monaco*, No. 51 (2011), 113–134.

Cuvier, Georges. "Éloge Historique de M. de Lamarck." In: *Recueil des Éloges Historiques Lus Dans les Séances Publiques de l'Institut de France*, Vol. III. Paris: Imprimeurs de L'Institut, 1861, 179–210.

Darnton, Robert. *Mesmerism and the End of the Enlightenment in France*. Cambridge, M.A. Harvard University Press, 1968.

Darwin, Charles. *The Origin of Species by Means of Natural Selection, or the Preservation of the Favored Races in the Struggle for Life*. London: John Murray, 1872.

Desmond, Adrian. *The Politics of Evolution: Morphology, Medicine, and Reform in Radical London*. Chicago: University of Chicago Press, 1989.

Dodman, Thomas. *Homesick Epoch: Dying of Nostalgia in Post-Revolutionary France*. PhD. diss., University of Chicago (2011). ProQuest Dissertations Publishing (3472835).

Dowbiggin, Ian R. *Inheriting Madness: Professionalization and Psychiatric Knowledge in Nineteenth-Century France*. Berkeley: University of California Press, 1991.

Farley, John. *The Spontaneous Generation Controversy from Descartes to Oparin*. Baltimore: Johns Hopkins University Press, 1977.

Galera, Andrés. "The Impact of Lamarck's Theory of Evolution Before Darwin's Theory." *Journal of the History of Biology*, Vol. 50, No. 1 (2017), 53–70. DOI 10.1007/s10739-015-9432-5

Gelbart, Nina Rattner. “The French Revolution as Medical Event: The Journalistic Gaze.” *History of European Ideas*, Vol. 10, No. 4 (1989), 417–427.

Gissis, Snait B. “Interactions Between Social and Biological Thinking: The Case of Lamarck.” *Perspectives on Science*, Vol. 17, No. 3 (Fall 2009), 237–306.

Gissis, Snait B. “Lamarck on Feelings: From Worms to Humans.” In: Wolfe, C.T. & O. Gal (eds.), *The Body as Object and Instrument of Knowledge: Embodied Empiricism in Early Modern Science*, Studies in History and Philosophy of Science 25 (2010), 211–239. DOI 10.1007/978-90-481-3686-5_11

Glass, Bentley, Owsei Temkin, and William L. Straus, Jr. (eds.), *Forerunners of Darwin 1745–1859*. Baltimore: Johns Hopkins Press [1959], 1968.

Hale, Piers J. *Political Descent: Malthus, Mutualism, and the Politics of Evolution in Victorian England*. Chicago: University of Chicago Press, 2014.

Hale, Piers J. ‘Rejecting the Myth of the Non-Darwinian Revolution,’ *Victorian Review*, 41, 2, (Fall 2015): 13–18.

Huneman, Philippe. “Montpellier Vitalism and the Emergence of Alienism in France (1750–1800): The Case of the Passions,” *Science in Context*, Vol. 21, No. 4 (2008), pp. 615–647. DOI 10.1017/S0269889708001981

Jacyna, L.S. “Medical Science and Moral Science: The Cultural Relations of Physiology in Restoration France.” *History of Science*, Vol. 25 (1987), 111–145.

Jordanova, Ludmilla. *Lamarck*. Oxford: Oxford University Press, 1984.

Kaitaro, Timo. “Can Matter Mark the Hours? Eighteenth-Century Vitalist Materialism and Functional Properties.” *Science in Context*, Vol. 21, No. 4 (2008), 581–592. DOI 10.1017/S0269889708001968

Kilborne, Benjamin. “Anthropological thought in the wake of the French Revolution: la Société des observateurs de l’homme.” *European Journal of Sociology*, Vol. 23, No. 1 (1982), pp. 73–91. jstor.org/stable/23999225

Lamarck, Jean-Baptiste. *Annuaire météorologique de l’an XI*. Paris: Maillard, 1803. Digitized by the Bibliothèque interuniversitaire de Santé.

Lamarck, Jean-Baptiste. *Histoire naturelle des animaux sans vertèbres*. Paris: Deterville, 1815–1822. Site Lamarck. www.lamarck.net.

Lamarck, Jean-Baptiste. “Jardin de botanique,” *Encyclopédie méthodique*. Paris: Panckoucke, Vol. 3 (1783), pp. 211–215.

Lamarck, Jean-Baptiste. “Nature,” *Nouveau dictionnaire d’histoire naturelle*. Paris: Déterville, Vol. 22 (1818), pp. 343–399.

Lamarck, Jean-Baptiste. *Philosophie zoologique.* Vols. 1 & 2. Paris: Dentu, 1809.

Lamarck, Jean-Baptiste. *Recherches sur l’organisation des corps vivans*. Paris: Centre de Recherche en Histoire des Sciences et des Techniques [1802], 2001. Digitized from a copy in the library of the Museo Galileo in Florence, Italy under the direction of Pietro Corsi for www.lamarck.net.

Lamarck, Jean-Baptiste. “Sur l’étude des rapports naturels.” In: Lamarck, Bruguière, Olivier, Haüy, & Pelletier (eds.), *Journal d’histoire naturelle*, No. 1 (1792), 361–71. Digitized by the Biodiversity Heritage Library. https://www.biodiversitylibrary.org/ia/journaldhistoire01brug/#page/1/mode/1up

Lamarck, Jean-Baptiste. *Système analytique des connaissances positives de l’homme*. Paris: J.-B. Baillière [1820], 1830. Site Lamarck. www.lamarck.net.

Lamarck, Jean-Baptiste. *Zoological Philosophy*. Translated by Hugh Elliot. London: Macmillan & Co, Ltd., [1809], 1914.

Landrieu, Marcel. *Lamarck, le fondateur du transformisme*. Paris: Société zoologique de France, 1909. babel.hathitrust.org/cgi/pt?id=hvd.32044055032304&view=1up&seq=9

Laurent, Goulven. “Paléontologie(s) et évolution au début du XIXe siècle: Cuvier et Lamarck.” *Asclepio*, Vol. 52, No. 2 (Dec. 2000), 133–222. DOI 10.3989/asclepio.2000.v52.12.211

“Letter to Thomas Jefferson from André Thouin, 16 June 1808,” *Founders Online*, National Archives, https://founders.archives.gov/documents/Jefferson/99-01-02-8165.

López-Beltrán, Carlos. “Forging Heredity: From Metaphor to Cause, a Reification Story.” *Studies in the History and Philosophy of Science*, Vol. 25, No. 2 (1994), pp. 211–235.

Lyell, Charles. *Principles of Geology*, Vol. II. London: John Murray, 1832.

More, Louis Trenchard. *The Dogma of Evolution*. New Jersey: Princeton University Press, 1925, pp. 163–184.

Nelson, William Max. “Colonizing France: Revolutionary Regeneration and the First French Empire.” In: Desan, Suzanne, Lynn Hunt, & William Max Nelson (eds.), *The French Revolution in Global Perspective*. Ithaca: Cornell University Press, 2013, pp.73–85.

Nordenskiöld, Erik. *The History of Biology: A Survey*. New York: Tudor Publishing Company, 1936, pp. 316–330.

de Nussac, Louis. “Lamarck et le muséum d’histoire naturelle.” *Aesculape*, Vol. 12 (1912), pp. 64–68.

Nye, Robert A. *Crime, Madness, and Politics in Modern France: The Medical Concept of National Degeneration*. New Jersey: Princeton University Press, 1984.

Osborne, Michael A. “Applied Natural History and Utilitarian Ideals: ‘Jacobin Science’ at the Muséum d’Histoire Naturelle, 1789–1870.” In: Ragan, Bryan T. & Elizabeth A. Williams (eds.). *Re-creating Authority in Revolutionary France*. New Brunswick, N.J.: Rutgers University Press, 1992, 125–143.

O’Sullivan, Lisa. “The Time and Place of Nostalgia: Re-situating a French Disease.” *Journal of the History of Medicine and Allied Sciences*, Vol. 67, No. 4 (Oct. 2012), 626–649. DOI 10.1093/jhmas/jrr058

Outram, Dorinda. *Georges Cuvier: Vocation, Science and Authority in Post-Revolutionary France*. Manchester: Manchester University Press,1984.

Outram, Dorinda. “The Language of Natural Power: The ‘*Éloges*’ of Georges Cuvier and the Public Language of Nineteenth Century Science.” *History of Science*, No. xvi (1978), 153–178.

Ozouf, Mona. *Festivals and the French Revolution*. Translated by Alan Sheridan. Cambridge, M.A.: Harvard University Press, [1976], 1988.

Packard, Alpheus S. *Lamarck, the Founder of Evolution: His Life and Work*. New York: Longmans Geen & Co., 1901.

Paterson, Mark. *Seeing with the Hands: Blindness, Vision, and Touch after Descartes*. Edinburgh: Edinburgh University Press, 2016.

Paulson, William R. *Enlightenment, Romanticism, and the Blind in France*. Princeton, N.J.: Princeton University Press, 1987.

Pick, Daniel. *Faces of Degeneration: A European Disorder, c. 1848–1918*. Cambridge: Cambridge University Press, 1989.

Quinlan, Sean. “Heredity, reproduction, and perfectibility in revolutionary and Napoleonic France, 1789–1815.” *Endeavour*, Vol. 34, No. 4, (2010), pp. 142–50. DOI 10.1016/j.endeavour.2010.09.003

Rehbock, Philip F. *The Philosophical Naturalists: Themes in Early Nineteenth-Century British Biology*. Madison: University of Wisconsin Press, 1983.

Reinhard, Marcel. “Nostalgie et service militaire pendant la Révolution.” *Annales historiques de la Révolution française*, Année 30, No. 150 (Janvier–Mars 1958), 1–15. jstor.org/stable/41926003.

Richards, Robert J. “The Emergence of Evolutionary Biology of Behaviour in the Early Nineteenth Century.” *The British Journal for the History of Science*, Vol. 15, No. 3 (Nov. 1982), 241–280.

Richards, Robert J. *The Meaning of Evolution: The Morphological Construction and Ideological Reconstruction of Darwin's Theory*, Chicago: University of Chicago Press, 1992.

Richards, Robert J. “The Influence of Sensationalist Tradition on Early Theories of the Evolution of Behavior.” *Journal of the History of Ideas*, Vol. 40, No. 1 (1979), 85–105. DOI 10.2307/2709261

Riskin, Jessica. *Science in the Age of Sensibility: The Sentimental Empiricists of the French Enlightenment*. Chicago: University of Chicago Press, 2002.

Roberts, Meghan K. *Sentimental Savants: Philosophical Families in Enlightenment France*. Chicago: University of Chicago Press, 2016.

Roger, Jacques. “Lamarck et Jean-Jacques Rousseau.” *Gesnerus*, Vol. 42 (1985), 369–381. http://doi.org/10.5169/seals-521535

Roger, Jacques. *The Life Sciences in Eighteenth Century French Thought*. Translated by Robert Ellrich. Stanford: Stanford University Press, [1963], 1997.

Rosen, George. “The Philosophy of Ideology and the Emergence of Modern Medicine in France.” *Bulletin of the History of Medicine*, Vol. 20, No. 2 (July 1946), 328–339. jstor.org/stable/44441053

Rousseau, Jean-Jacques. “Discourse on the Origin and Foundations of Inequality Among Men.” In: Gourevitch, Victor (ed.). *Rousseau: The* Discourses *and Other Early Political Writings*. Cambridge: Cambridge University Press (1997), 111–222.

Rudwick, Martin J. S. *Georges Cuvier, Fossil Bones, and Geological Catastrophes: New Translations and Interpretations of the Primary Texts.* Chicago: University of Chicago Press, 1997.

Spary, Emma C. *Utopia's Garden: French Natural History from Old Regime to Revolution*. Chicago: University of Chicago Press, 2000.

Sponsel, Alistair. *Darwin's Evolving Identity: Adventure, Ambition, and the Sin of Speculation*. Chicago: University of Chicago Press, 2018.

Staum, Martin S. *Cabanis: Enlightenment and Medical Philosophy in the French Revolution*. Princeton: Princeton University Press, 1980.

Stocking, George. "French Anthropology in 1800," *Race, Culture, and Evolution: Essays in the History of Anthropology*. Chicago: University of Chicago Press, (1968), pp. 13–41.

"Testament de Jean-Baptiste-Pierre-Antoine de Lamarck" (9 fev. 1822). MC/ET/XXXVIII/921. Minutes du notaire Pierre Louveau. Salle des inventaires virtuelle des Archives nationales de France; accessed 18 Feb. 2021.

Weiner, Dora B. *The Citizen-Patient in Revolutionary and Imperial Paris*. Baltimore: Johns Hopkins University Press, 2002.

Wheeler, William Morton & Thomas Barbour (eds.), *The Lamarck Manuscripts at Harvard*, "Preface" and "Introduction." Cambridge, M.A.: Harvard University Press, 1933.

Whewell, William. *Philosophy of the Inductive Sciences*. Cambridge: Cambridge University Press [1840], 2014.

Williams, Elizabeth A. *The Physical and the Moral: Anthropology, Physiology, and Philosophical Medicine in France, 1750–1850*. Cambridge: Cambridge University Press, 1994.

Wilson, J. Walter. "Biology Attains Maturity in the Nineteenth Century." In: Clagett, Marshall (ed.). *Critical Problems in the History of Science*. Madison: University of Wisconsin Press, 1969, pp.401–418.

Wolfe, Charles T. & Motoichi Terada, "The Animal Economy as Object and Program in Montpellier Vitalism." *Science in Context*, Vol. 21, No. 4 (2008), pp. 537–579. DOI 10.1017/S0269889708001956

Young, Robert M. "Malthus and the evolutionists: the common context of biological and social theory," *Past & Present* 43 (May 1969), 109–145.

Young, Robert M. “The Role of Psychology in the Nineteenth-Century Evolutionary Debate.” In: Henle, Mary, Julian Jaynes & John J. Sullivan (eds.). *Historical Conceptions of Psychology*. New York: Springer, 1973, pp.180–204.

Zammito, John H. *The Gestation of German Biology: Philosophy and Physiology from Stahl to Schelling*. Chicago: University of Chicago Press, 2018.