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The "Nature" of Enlightenment

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A generation ago, studies of nature and the natural in eighteenth-century France concentrated upon the scope of the repertoire for interpreting nature, from Platonism to pantheism, from the classical to the calculating, from the agricultural to the Arcadian.[1] By contrast, histories of the Enlightenment in the same period and country were long equated with a particular philosophical tradition, epitomized by the *Encyclopédie* of Diderot and d'Alembert. The relations between nature and enlightenment were used to illustrate the radicalism of individuals from the Enlightenment canon such as d'Holbach, Helvétius, or Diderot, by showing their innovative applications of notions of nature and reason to human society and the absolutist state.[2] Here, appeals to nature were associated with anticlericalism, even atheism, and with sweeping social reform. More recently, the "history of biology" has yielded a body of writings suggesting that scientific pursuits performed by a circumscribed, usually institution-based, group of "scientists" encompassed certain views and practices taken to epitomize the "real" purpose of enlightenment.[3]

These traditions, however, restricted the commentary on nature-culture-enlightenment to a tiny and closely scrutinized group of individuals. Moreover, they assumed the closure of debates about the meaning of the scientific, the natural, and the enlightened that were far from being settled at the time. What happens to the generally received understanding of the terms "enlightenment" and "nature" if, instead, one takes as the subject of a historical study individuals who themselves traded in notions of nature? Here, my aim is not to explore the reasons why eighteenth-century writers frequently invoked nature in the same breath as enlightenment, but rather the function that such invocations performed. The account that follows is largely limited to natural history texts in French, published between 1740 and 1790. As such, it only represents a preliminary sketch of an alternative to the existing secondary literature on this question, a cultural history of French natural history.[4] Nonetheless, it will become clear that such a history can help to demonstrate that "nature" was not merely an "idea" that could be utilized at will by all participants, but a symbol whose contested usage connoted different social worlds and (naturalized) power hierarchies.

1. Ehrard, *L'idée de la nature;* Charlton, *New Images of the Natural;* Pilkington, "'Nature' as Ethical Norm"; Delaporte, *Nature's Second Kingdom.*

2. Hawthorn, *Enlightenment and Despair,* 13; Gay, *The Enlightenment;* Kors, *D'Holbach's Coterie.*

3. Callot, *La philosophie de la vie;* Glass et al., *Forerunners of Darwin;* Salomon-Bayet, *L'institution de la science;* Sloan, 'Buffon's Idea of Biological Species'; Dawson, *Nature's Enigma.* My comments here extend only to the literature on French natural history. Buffon looms large in the combined tradition of the history of ideas and the search for the origins of the 'life sciences', as exemplified in Beaune, *Buffon 88;* Roger, *Buffon,* 89–90; Roger, *Les sciences de la vie.*

Natural history's scope extended well beyond the boundaries of mathematization, experimentalization, and even rationalization that have often been taken to characterize the enlightenment project. Even the empiricism upon which natural historical practitioners prided themselves did not trivialize, in their view, the study of the effects of nature upon the subjective interplay of the passions. Rather than seeing the eighteenth century in the light of the nineteenth—that is to say, as a process of development toward an ideal of experimental, historical inquiry into the natural world—perhaps one might treat natural history in broader terms, as it was understood and practiced by a large and enthusiastic section of polite society from 1740 until 1790. Rather than assuming automatic hierarchies of institutionalized over noninstitutionalized practices of natural history, or of professionals over amateurs, one can explore how contemporaries interpreted the boundaries of expertise in natural history.

Histoire naturelle in eighteenth-century France existed to a large extent outside any institutional context. It occupied a social place that is now hard to categorize unless contemporary society is understood in terms of the tangled and slippery networks of patronage that simultaneously enabled the practice of *histoire naturelle* and placed limitations on the kinds of inquiry naturalists could pursue. If enlightenment is translated into an account of the development of disciplines and institutions, then the meaning of *histoire naturelle* within eighteenth-century French society is lost. For most of its practitioners were not institutionally employed; and the lucky few who, by the end of the century, had a coveted post that paid rather than required money for the pursuit of natural history, sought to construct a new natural history stripped of all aesthetic and commercial aspects. These aspects were, however, what distinguished "natural history" in the *siècle des Lumières* from earlier and later projects by the same name. Standard accounts of growing institutionalization and professionalization do not sit easily with these midcentury practices. In 1773, for example, when the Académie Royale des Sciences discussed the possibility

4. I borrow here particularly from Chartier, *Cultural History,* introduction; but see also Jardine and Spary, "Natures of Cultural History."

of a reshuffle that would have created a class of natural history within the institution, the young botanist and physician Antoine-Laurent de Jussieu defended the existing categories of anatomist, botanist, and mineralogist. The name *histoire naturelle,* he insisted, would prohibit specialization in particular topics; the generality of the subject would harm the scientificity of academic knowledge.[5]

But it was those who already possessed institutional posts who wished to redefine the scientific as that which was pursued in institutions. Such attacks should not be taken to reflect the status quo in France at this time, but rather as an indication of the hopes of a small group who would successfully negotiate positions of power during the French Revolution.[6] To view natural history from this perspective forces us to reinterpret the significance of the Foucaldian "gaze" at the end of the century. The transformation in ways of seeing and ordering natural objects in the period 1775–1825, which Foucault identified as a shift from "classical" to "modern" epistemes, reflected a profound change in the makeup of the group shaping the content of natural history, a change that entailed a reevaluation of the criteria of scientificity, order, taste, and display in natural history. The Revolution would have its most devastating effects upon precisely the categories of people who had practiced natural history during the Enlightenment, stripping them of wealth and rank, and thus overturning the hierarchy of emulation, possession, and taste that had previously given value and meaning to natural history specimens and practices. Thus the shift observed by Foucault as an epistemic phenomenon can only be explained if one moves outside the institutional context to consider how the practice of natural history reflected the diversity of the educated levels of eighteenth-century French society.[7]

Within this culture, both nature and enlightenment were functional terms, rather than descriptive ones. Both were normalizing and universalizing: providing standards for behavior that extended far outside the realm of polite society, unlike manners or erudition. In twentieth-century accounts, enlightenment is still sometimes portrayed as a process of liberation, learning, and utility that was democratically accessible to all. But, whether viewed as process

5. "Observations sur le projet de changer le nom de la classe de botanique en celui d'histoire naturelle" (1774), MS 1197, pièce 17, Bibliothèque Centrale du Muséum National d'Histoire Naturelle.

6. Spary, "Making the Natural Order."

7. Foucault, *Les Mots et les choses.* On the question of this shift, see Lepenies, *Das Ende der Naturgeschichte,* who, however, like Larson, *Interpreting Nature,* takes the victory of the nineteenth-century scientific method for granted. The project of natural history that I describe, despite its diversity, was restricted to the polite world or beau monde of midcentury France; collecting was apparently not practiced by laborers or even in artisanal families prior to the Revolution.

or event, it has just as readily been demonstrated to be a phenomenon of cultural imperialism, riven by its own inconsistencies. This chapter explores some of the Manichaean processes that were bound up in all discourses about nature and enlightenment, as expressed within some rather less well studied manifestations of that relationship.[8]

Monarchical Myology

In 1746, Jacques Gautier d'Agoty (d. 1785) published his *La Myologie complete, ou description de tous les muscles du corps humain* as a vehicle for a new printing technique of which he was the owner and which involved layered printing of the same sheet of paper with a succession of up to three different colors. The *Myologie,* a folio work, with each plate produced using the new technique, was d'Agoty's showpiece; using it, he hoped to attract attention from the elite world for his invention and for himself, and thereby move further up the patronage scale that dominated the lives of educated Parisians. This work, and a subsequent *Anatomie complete de la tête,* both with texts by the academician anatomist Duverney, did indeed attain a modest success, the *Anatomie* receiving a royal gratification of 600 livres. Six years later, d'Agoty began to publish a short-lived journal, the *Observations sur la Physique, l'Histoire Naturelle et la Peinture.*[9] D'Agoty included a number of plates in the journal, several of which had been printed with the color technique. Among the natural historical topics covered were the problem of human generation, the cultivation of silkworms, and the anatomy of a variety of small animals, including the snail, mole, and frog.

The journal appeared at a time of intense interest in the problem of generation in the savant world, some ten years after the discovery by a Swiss tutor, Abraham Trembley, that a small freshwater polyp possessed the faculty to replicate from severed parts—in other words, that a new individual could be created by a mechanical operation, without divine intervention. Vartanian has discussed the ways in which various "representatives" of the Enlightenment such as Buffon, Diderot, and La Mettrie responded to the polyp problem, in many cases by abandoning their adherence to versions of ovist or spermaticist preformation in favor of epigenetic (sometimes materialist) versions of

8. See Bender, "A New History of the Enlightenment?" The drawing of ethical conclusions from studies of "the Enlightenment" seems still to be a powerful imperative for historians, encouraging the continued reification of the Enlightenment as historical object. For recent perspectives upon the debate, see Outram, *Enlightenment;* Porter, *Enlightenment;* Porter and Teich, introduction to *Enlightenment in National Context;* Lively, "Europe of the Enlightenment"; Crocker, "Interpreting the Enlightenment"; Jacob, "Enlightenment Redefined"; Foucault, "What is Enlightenment?"; Hulme and Jordanova, *Enlightenment and Its Shadows;* La Vopa, "Conceiving a Public."

9. Continued by d'Agoty and Toussaint, 1756–57.

generation.[10] D'Agoty is far from being part of this Enlightenment canon. In fact, his attacks on Newton, particularly upon the theory of colors (manifested in his color printing techniques) caused him to be marginalized both within his lifetime and in subsequent biographies.[11] It is thus all the more interesting to find him criticizing ovist preformationist explanations of generation by appealing to enlightenment. In an enlightened century, he argued, no rational person could possibly believe that the female could play the principal role in generation. The simple evidence of one's own eyes revealed that the fetal structures were all present and perfect within the male ejaculate, as Hartsoeker had demonstrated. As proof, d'Agoty supplied a color picture of semen (presumably his own) in a glass of water, shown in figure 9.1.

For d'Agoty, it was thus an error of perception to suggest, as "oviparists" including his old collaborator Duverney (the only living individual named in his list) were doing, that the mother contributed more than mere matter to the fetus. Although he opposed the claims of both "oviparists" and "vermiculists," he directed his main attack against the former. The danger of oviparism lay in its social consequences.

> At all times, and all over the earth, fathers have been regarded as the true pro-creators of their children; all the honors of generation have been given to them. Even the language of sacred Scripture supports this doctrine. There it is always said that such [a man] begat another, and it is never said of women that they begat. They would however beget in effect, if they were to furnish their part in the substance of the fetus. I might go so far as to say that it is upon that universal belief that the preeminence of our sex over the other is founded; in particular here in France the Salic law concerning the succession of the Crown.[12]

In part 11 of the *Observations* (1754), d'Agoty described carrying out experiments on male and female frogs at Cressy, before an audience of the king and members of the Paris medical faculty, to show the living fetus in the seminal

10. Vartanian, "Trembley's Polyp"; Gasking, *Investigations into Generation*, outlines the differences between ovist preformation (fetal parts preformed at generation, with the male providing only the initial spark of life), spermaticist preformation (fetal parts preformed in the individual sperm, or—as here—in the semen as a whole, with the mother providing only inert matter), and epigenesis (fetus formed ex nihilo from matter, sometimes with the regulated play of forces). For a fuller discussion, I refer the reader to this work.

11. D'Agoty's alternative was separately published in a range of works such as his now rare *Chroagénesie, ou génération de couleurs, contre le système de Newton*. He argued for the existence of four primary colors, black, blue, yellow, and red. The *Nouvelle Biographie Universelle* article on d'Agoty distributed equal amounts of ridicule on his printing technology and his scientific views.

12. D'Agoty, "Découvertes sur la génération, contre les Oviparistes et les Vermiculistes," in *Observations sur l'Histoire Naturelle* (1752), 1:16. Quotations from this work hereafter cited by page in the text.

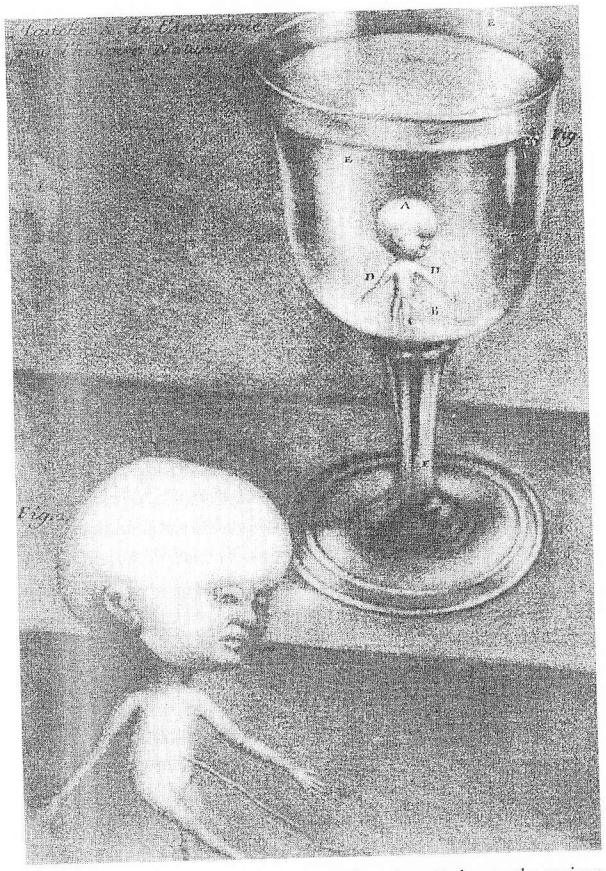

Fig. 9.1. D'Agoty's ejaculate in a wine glass. A to D denote the various fetal body parts, including an umbilical cord ready to plug into the maternal womb. From Jacques Gautier d'Agoty, *Observations sur la Physique, l'Histoire Naturelle et la Peinture* (1752), vol. 1, opposite 16. By permission of the Syndics of Cambridge University Library.

vesicles of the male. Unfortunately, the experiments were inconclusive, for similar fetuses appeared in the female. Since frogs lacked a penis, it was not, d'Agoty admitted, easy to understand how the living fetuses could have entered the female body from the male. Although his experiments were proving difficult to replicate, he insisted that it was not the result of errors in his vision:

"[T]he quality of Painter and Draughtsman that I possess preserves me from illusion where the observation of shapes is concerned" (50). Only further experiments on frogs and snakes could explain the mystery of generation for these animals. At the end of this issue, in a discussion of extracts from other journals, d'Agoty outlined his cosmology: the earth was the passive principle, the "vagina" into which trees and plants deposited their seeds; likewise, female animals were the earth into which males deposited their seed. This power of generation and succession of individuals proved the reality of creation (151).

For d'Agoty, there was the most intimate link between paternity, monarchism, and natural history. Others likewise appealed to natural historical evidence to support the monarchical, paternalist model of society.[13] The d'Agoty family continued to represent this view of the social order, as far as it is possible to judge. Because of the marginality of the family and its printing techniques, only fragmentary materials concerning the family or published by its members survive. We know very little about d'Agoty's background or income, and nothing about two of his sons, nor (significantly) anything about his wife and daughters. He himself continued until the end of his life to publish prints using his own techniques on a range of natural historical and medical subjects, and on painting and color theory.[14] His eldest son, Arnaud-Eloï, revived his father's journal as *Observations périodiques sur l'Histoire Naturelle, la Physique et les Arts* for one year, 1771. After his death in the same year, it became the model for the far more successful journal edited by the agronomist Rozier, generally known under the title *Journal de Physique.*[15] Two younger sons produced some incomplete and now very rare series of portraits of French monarchs: Jean-Baptiste (d. 1786) published a *Monarchie françoise, ou recueil Chronologique des portraits en pied de tous les rois & les chefs des Principales familles* (Paris, 1770). Jean-Fabien (b. 1730) published both anatomical and natural history prints, and portraits of Louis XV, Cardinal Fleury, and others. The d'Agoty family's technology was thus the material link between natural history and paternalist monarchy.[16] Indeed, the continuing affirmation of monarchism through printing and natural history was the very basis for the continuing success of the family in polite society.

13. See, e.g., Buffon, "Les animaux carnassiers," in *Histoire naturelle*, vol. 7 (1758): "An Empire, a Monarch, a family, a father, here are the two extremes of society: these extremes are also the limits of Nature." Unlike d'Agoty, Buffon stressed the equal role of male and female in generation at this time.

14. But see his candid acknowledgment of his own marginality in "Lettre de M. Dagoty père," *Mercure* 109 (August 1775): 175–79.

15. Its real title was, however, *Observations sur la Physique, sur l'Histoire Naturelle et sur les Arts.*

16. See the entries on various members of the d'Agoty family in the *Nouvelle Biographie Universelle.*

Systematizing Society

It might be thought that I have played devil's advocate here by choosing as my model for enlightenment a family of marginal, paternalist, anti-Newtonian, royalist color printers. But d'Agoty is not the only natural historical writer who directly appealed to enlightenment, reason, and modernity in order to promote a view of French society that differs sharply from our expectations of what is entailed by those terms. François-Alexandre Aubert de La Chesnaye des Bois (1699–1784) is another such individual, about whom even less is known, except the fact that he apparently abandoned a Capuchin order to scrape out a living writing and translating in Paris. De La Chesnaye's *Systême naturel du Regne animal, par classes, familles ou ordres, genres et especes* (Paris, 1754), which received the royal privilege for publication, arranged quadrupeds, birds, and amphibians according to the method of Jakob Klein. It was a standard example of the kind of project undertaken by eighteenth-century writers: testing the water with a short work, planned merely as a preliminary to a longer study on the same topic, in this case the *Dictionnaire raisonné et universel des animaux, ou le regne animal* (Paris, 1759). In the preface, the former monk aligned himself firmly with the moderns: only their writings could help to correct the errors of the ancients. He even endorsed Buffon and Daubenton's attack on the cognitive principles underlying methods of classification in their *Histoire naturelle* of 1749, although like many others, he had resorted to a patchwork of methods borrowed from other naturalists to organize the book: Klein for quadrupeds, birds, and amphibians; Artedi for fish; Linnaeus for the insects and worms in volume 2.[17] Being a modern, however, he promised to correct any errors in his sources whenever they might arise.

In the same year, de La Chesnaye also translated the *Doutes ou observations de Mr. Klein,* concerning several of Linnaeus's classes of animals, from the Latin. His preface succinctly summarized the Linnaeus-Klein controversy: Klein's publication of a critique of Linnaeus's *Systema naturae* in Danzig in 1743 and his fame in the German lands for his alternative systems of quadrupeds and birds. Ultimately, however, such debates served the progress of natural history: it was by means of the proliferation of systems "that all the Sciences are modeled and remodeled by new pens, which never change anything fundamental about them, but may perfect them." For the translator, the trajectory of modernity was the product of compilation and revision.

> As long as there are philosophers uniquely occupied in admiring the Creator's marvels, and in observing them in the three Kingdoms as if with

17. Sloan, "Buffon-Linnaeus Controversy."

> the eyes of Argos . . . , this science [which is] so natural for man, and so worthy of his curiosity, will make perpetual progress. Every day for more than a century, there have been new Observations and new Discoveries, and consequently new Riches in favor of those who feel that they have enough taste and patience to cultivate [natural history].[18]

De La Chesnaye's renown as a writer derived principally from his classifications of French society, however. The notion of an underlying "right" toward which human disagreements strove underpinned these also. In the second edition of the *Dictionnaire de la Noblesse* (1770), a work judged so aristocratic by the Jacobins that it was condemned to be destroyed, de La Chesnaye promised—as his title spells out—the "genealogies, the History and the Chronology of the Noble Families of France, the explanation of their arms, and the condition of the great Estates of the Realm today possessed as Principalities, Duchies, Marquisates, Counties, Viscounties, Baronies, etc. whether by creation, inheritance, alliances, donations, substitutions, mutations, purchase or otherwise." In natural law, men were equal, de La Chesnaye claimed. If monarchy was rejected in the name of liberty by the ancient Greeks, "Nobility however was not unknown among them" in the form of descendants of the first Heroes. The Romans and Gauls, likewise, recognized a nobility. The conquering Franks suppressed this Gallic nobility, and high-ranking Gauls turned to the ecclesiastical estate instead. Although the first French were rude barbarians, greedy and restive for all their valiance and love of liberty, there were lords among them to whom the people devoted itself by virtue of their birth or outstanding actions.[19] Thus de La Chesnaye reversed the distinction between the right to nobility by birth versus that attained through achievement: since even the most ancient civilizations possessed the latter, it was actually *more* ancient than the former, which only originated with the French monarchy. As soon as the dignity of nobles was no longer attached to achievement, it ceased to excite others to glory.

De La Chesnaye's brief history of French nobility was addressed principally to the nobility (or would-be nobility) itself. Particularly in the second half-century, there was considerable interchange between some sections of the French nobility and wealthy commoners in the beau monde, through marriage and the possession of common centers of cultural exchange.[20] The well-to-do, particularly landowners, were almost certainly the principal consumers of natural history, the only group which could afford the hand-colored folio

18. "Avis," in *Doutes ou observations de Mr. Klein,* 3–4.

19. "Avant-Propos," in *Dictionnaire de la Noblesse,* ii. On noble histories, see Baker, *Inventing the French Revolution,* chap. 2; Ellis, "Genealogy, History, and Aristocratic Reaction."

20. See Chaussinand-Nogaret, *French Nobility.*

volumes of Pierre-Joseph Buc'hoz and Pierre-Philippe Alyon, for example, or the china dinner services depicting Buffon and Bexon's natural history of birds, which the future comte de Buffon called "my Sèvres edition."[21] The wealthy alone possessed the power to purchase titles or pay dowries for assimilation into the nobility. Many natural history writers framed their projects for this audience in terms of an appeal for a revival of distinction and merit among the nobility, responding to contemporary concerns about the erosion of the noble state by intermarriage. These were certainly not proposals for egalitarian social reform: thus de La Chesnaye extolled the art of genealogy as enabling the classification of families and the generation of a history of heroism, in effect a system for historical classification. "Without the thread of the Genealogical and Heraldic Art, one loses oneself in the labyrinth of names; one confuses everything, and one fails to distinguish the chronological sequence." In fact, genealogy enabled one to distinguish the original "Nobles by race" (families always recognized as being noble) from the "Nobles by birth" (mere creations by the monarch)—thus allowing the all-important distinction to be made between illustrious ancient families, their origins lost in the mists of time, and recent creations. "What science, indeed, is more necessary for social harmony than that of Genealogies?"[22] The function of classification, in all the respects in which de La Chesnaye used it, was always that of generating hierarchies of value: naturalists' chronological progressions toward modernity, animals' bodily complexity, nobles' historical rights. Thus, whether classification was spatial, morphological, or temporal, it was always comparative.[23]

Natural historical classifications adopted a particular naturalizing sleight-of-hand, which slipped between the natural world and the social, simultaneously generating distinctions of class, nation, gender, age, and geography. But before such classifications could be operated universally, naturalists needed to recruit—read "enlighten"—a particular wealthy and powerful audience, and to establish not only the expertise of naturalists over the natural, but also the

21. E.g., Buc'hoz, *Nouveau Traité physique et économique* (1787); Alyon, *Cours de Botanique* (1787). Buffon and the abbé Bexon's *Histoire naturelle des Oiseaux* (1770–83) fetched thirty livres for the folio edition, twenty-four for the small folio, and eighty-eight for the edition with ninety-eight colored plates (*Journal de Paris,* April 10, 1779, 400). Roche, *Les républicains,* chaps. 2 and 3, describes the increases in publication and purchasing of works on the sciences and arts over the course of the eighteenth century.

22. "Avant-Propos," *Dictionnaire de la Noblesse,* xiv. See also Buffon, "Le Lion," in *Histoire naturelle,* vol. 9 (1761): "I understand by species [which are] noble in Nature, those which are constant, invariable, and which one cannot suspect of having degraded."

23. Here my argument differs somewhat from the interesting studies of the history of systematics. For France, in particular, see Stafleu, *Linnaeus,* chap. 8; Duris, *Linné et la France;* nothing approaching Allen, *Naturalist in Britain,* exists for France, but c.f. Gillispie, *Science and Polity,* on the Société d'Histoire Naturelle.

dominance of the natural over the social, and consequently over both polite society and the "people." Thus, by transforming both those who practiced the sciences of nature and those who were classified by them, the reductive power of nature could serve as an instrument of enlightenment whether empowering or disempowering. This transformative role was couched, in many natural history texts, within a narrative about the development of the self in the light of reason.

Civil Conversations

Self-development was a theme elaborately explored in Gilles-Augustin Bazin's two-volume popularization of René-Antoine Ferchault de Réaumur's *Histoire naturelle des insectes.* Bazin was one of an elliptical patronage group of naturalists with two "foci": the first, in Paris, was centered on Réaumur (b. 1683), a leading figure in the Académie Royale des Sciences of Paris from his entry in 1708 as *élève géometre* until his death in 1757. Réaumur was elected *directeur* of the academy eleven times between 1714 and 1753, and *sous-directeur* eight times between 1713 and 1752. The second "focus" was Charles Bonnet (1720–93), naturalist and philosopher, in Geneva, a relation of Abraham Trembley, the discoverer of the polyp. Bonnet's *Contemplation de la Nature* (Amsterdam, 1764) was one of the most widely read works in France. Prior to Réaumur's death, he had been one of Réaumur's most devoted protégés and correspondents.[24]

Réaumur's early association with the Académie des Sciences in Paris as a geometer was reflected in his subsequent approach to natural history. His most famous work was his *Mémoires pour servir à l'Histoire des Insectes,* published between 1734 and 1742 under the academy's privilege. But most of his publications concerned the animals then known as insects (including what we now call crustaceans) and, to a lesser extent, the birds. Insects, especially, served as the most evident demonstrations of his natural theological geometries. Thus, his natural theological version of natural history, to which Buffon was bitterly opposed, often appeared in the works of contemporaries as inextricably associated with the study of insects. The example par excellence of design in the natural world was the beehive, and Réaumur's accounts of the construction of the honeycomb in volume 5 of the *Mémoires* (1740) became a showpiece of natural theological argument. Réaumur had used geometry to show what the divine *mécanicien* was about: hexagonal cells such as those that bees constructed

24. Grasse, *La vie et l'oeuvre de Réaumur,* 1–11, 17–24; Dawson, introduction to *Nature's Enigma;* Torlais, *Un ésprit encyclopédique,* 157–68. De La Chesnaye was also one of Réaumur's protégés, according to Hérissant, *Bibliothèque physique de la France.* The popularity of Bonnet's work is described in the *Journal de Paris,* 31 August 1779.

from wax were of the shape that exploited the space available most effectively, while using the least wax.

Such was Réaumur's dominance over the realm of insects that subsequent works of natural history drew their descriptions of insects largely from his. Not until the very end of the century, at the hands of Latreille and Olivier, did a different science of insects come to form a part of natural history; Buffon and his protégés neglected the area almost entirely. In his *Pensées sur l'Interprétation de la Nature* (1754), Diderot, a staunch supporter of Buffon's natural history, echoed that naturalist's criticism that insects were too small and too troublesome to be worthy of serious study:

> And you, who take the title of philosophers or of wits and who do not blush to resemble those importunate insects which spend the instants of their ephemeral existence in annoying man . . . What is your aim? . . . Despite your efforts, the names of Duclos, d'Alembert and Rousseau; of Voltaire, Maupertuis and Montesquieu; of Buffon and Daubenton will be honored among us and our nephews; and if anyone remembers yours: "They were, he will say, the persecutors of the foremost men of their times; and if we possess the preface of the Encyclopédie, the Histoire du siècle de Louis XV, the Ésprit des Lois, and the History of nature, it is because luckily it was not within the power of those people to deprive us of them."[25]

This division of the natural world reflected more than just a difference in theoretical priorities. The sharp separation between the patronage groups of Buffon and Réaumur divided the Académie des Sciences for several generations. Former Réaumur supporters fielded the young marquis de Condorcet in opposition to Buffon's candidate for the permanent secretaryship of the academy in 1771, and Condorcet, although not a Réaumur protégé, was responsible for the famously scathing *éloge* of the "great charlatan" Buffon in 1788.[26] However, the construction of the *Encyclopédie* as the principal representative of "enlightenment" has meant that Réaumur's natural history has generally been portrayed as reactionary, because opposed to the reforming ideals of the Encyclopedists. These judgments represent the results of a struggle for audiences and patrons and for control of institutions such as the Académie des Sciences and the Jardin du Roi. Outside the limited circles of those immediately

25. Diderot, "Des obstacles," pensée 4 in *Pensées sur l'Interprétation de la Nature.* J.-A. Lelarge de Lignac, a protégé of Réaumur, criticized the natural history cabinet at the Parisian Jardin du Roi (run by Buffon and his protégés) precisely for its lack of adequate representation of birds and insects. By order of the king, however, Réaumur's collections were assimilated into the Jardin's cabinet at the naturalist's death in 1757 (Orcel, "Daubenton").

26. Baker, "Les débuts de Condorcet"; Roger, *Buffon.*

involved in establishing and maintaining these boundaries, however, the different approaches to the natural world advanced by Réaumur and Buffon were commonly amalgamated in the representations of natural history that reached polite society as a whole. For example, Jacques-Christophe Valmont de Bomare's *Dictionnaire raisonné universelle d'histoire naturelle,* which appeared in several editions, was a pastiche of extracts from, among others, Buffon for the quadrupeds and birds, Réaumur for the insects, several botanists on plants, and his own works for the minerals.[27] Concerns with the demands of patronage and audience, the utility of natural history, and the spectacle of nature pervaded natural history publications.

Réaumur's correspondent Bazin (d. 1754), a Strasbourg physician, devoted many of his published writings to adapting Réaumur's works on insects, complete with natural theological message, to a different readership. In particular, he published the two substantial volumes of the *Histoire Naturelle des Abeilles* (Paris, 1744). From the start, his purpose was clearly set out: to popularize the art of beekeeping among French landowners and thus to improve the wax trade. Peasants lacked both the money and time to perfect the art, so that it was the responsibility of the wealthy and leisured landowners to do so. Bazin pinpointed the principal mismatching of savant writing such as Réaumur's and the fears and habits of the "intelligent people" in the countryside who might help to perfect apiculture. The *Mémoires,* Bazin claimed, was a work "which by its price, length and the learning contained within it, only seems to be accessible to Savants and the Curious." Thus those who knew bees best and spoke of them most knowledgeably "have only addressed themselves to those who are not able to profit from their discoveries and teachings."[28]

Bazin's solution to the problem of enlightening the polite readership, like that of so many other natural history writers midcentury, was to fictionalize the encounter between a leisured woman, wife to a country landowner, and her friend, who was savant to follow the reasoning of Réaumur (and who, Bazin claimed, represented himself). Clarice and Eugène's exchanges were supplied as lively dialogues, a style of presentation common in natural history works where, in a friendly and informal setting, one or more instructed characters conversed with and improved an unenlightened individual, usually a child, but in this case a woman.[29] Such conversations typically involved mem-

27. Valmont also offered public lectures on natural history from 1756, and his course supplied the raw material for the *Dictionnaire.* See Lacombe's review of one edition in *Mercure* (October 1775, no. 1): 151–56 (vol. 109 of the facsimile edition of *Mercure* published in 1971).

28. Bazin, "Avertissement," in *Histoire Naturelle des Abeilles,* 1:10.

29. See Cope, *Compendious Conversations;* Amies, "Amusing and Instructive Conversations"; Mortier, "Variations on the Dialogue in the French Enlightenment"; Gordon, "Public Opinion"; Goodman, "Governing the Republic of Letters."

bers of the first two orders of French society, the clergy and the nobility. This format was quite standard in the educational writings of the mid–eighteenth century, and perhaps reflected an increasing number of attacks on the irrelevance of the secluded monastic education that had still been the norm in the seventeenth century. Writers such as Voltaire railed against the failure of such instruction to prepare one for life in the beau monde; proper education should reflect the setting in which ordinary life took place.[30]

The work of both Réaumur and Bazin belongs within a corpus of writings on the reform of *éducation* through the polite exchange of learning.[31] In the *Histoire Naturelle des Abeilles,* the acquisition of natural historical knowledge has a theological purpose, teaching the reader about the similarities and differences between God's plans for the animal and human worlds. But the book serves a far broader function, for it makes inextricable the strands of self-improvement, patriotism, and wealthy amusement. Here commerce in the sense of trade and commerce in the sense of social exchange are intricately interwoven, and both are the necessary underpinnings for national prosperity and wealth. Bees, routinely portrayed as exemplifying industriousness, serve as Bazin's models for the ideal *polis,* following God's laws to achieve the good of the whole. The product of natural history is, thus, to be the exercise and understanding of civic duty and the cultivation of the mind. Recent writings on the *siècle des Lumières* have stressed the importance of this development of the model of civic responsibility as an ideal of noble self-development that separated the identity of polite society from the monarchical hierarchy upon which it was dependent.[32]

The transformation suggested by Bazin for the French provincial landowner is above all manifested in Eugène's appropriation of a pack of playing cards—symbols of the shallow hedonism of the leisured world—to model the cells in a honeycomb, shown in figure 9.2. It is also exemplified by the transformation of the frivolous, satirical, mocking Clarice into a serious, public-spirited, responsible philanthropist.[33] Bazin's initial description of her was as a

30. Voltaire especially stressed the importance of matching the place of education to the child's ultimate place in society; see Spencer, "Women and Education," in *French Women and the Age of Enlightenment,* 90–91.

31. Chisick, *Limits of Reform,* 42, indicates the extent to which the expulsion of the Jesuits fueled the debate on education. For recent uses of politeness as a criterion for participation in the social elite, see Lougee, *Paradis des Femmes;* France, *Politeness and Its Discontents,* chap. 4; Goodman, *Republic of Letters;* Goldgar, *Impolite Learning,* chap. 1; Sutton, *Science for a Polite Society,* 103–41.

32. Chaussinand-Nogaret, *French Nobility,* especially chap. 2; Gordon, "Public Opinion"; Goodman, *Republic of Letters;* all drawing upon Elias, *Civilising Process.*

33. My reading of the gender role allocated to Clarice and to the queen bee differs sharply from that of Merrick, "Royal Bees," who sees naturalists such as Bazin and Réaumur as limiting

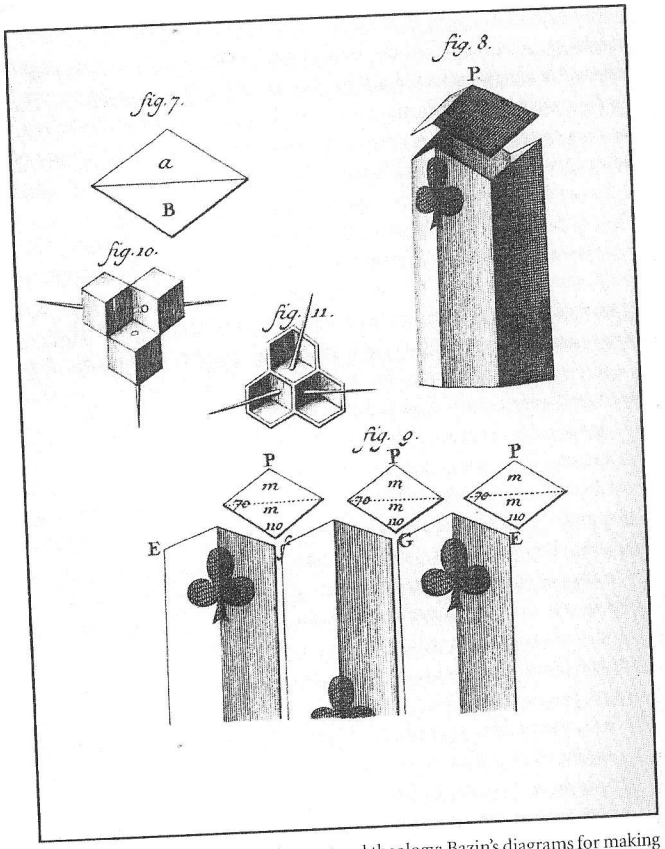

Fig. 9.2. Converting frivolity into natural theology: Bazin's diagrams for making honeycomb cells out of playing cards. From Gilles-Augustin Bazin, *Histoire Naturelle des Abeilles* (1744), vol. 2, plate 8. By permission of the Syndics of Cambridge University Library.

"mother of a family, living on her estate, and whose mind has no other cultivation than that acquired from a good education, worldly commerce, and the

the importance of bees as moral models in order to enforce gender categories confining women within domestic and maternal roles. Clearly Bazin was treating Clarice's maternal responsibilities in a civic sense, generating rather than denying a public existence for her. On card playing as the symbol among enlightened scientific practitioners of noble corruption and of the deception of the public by charlatans, see Stafford, *Artful Science*, 90.

reading of books which are not completely frivolous."[34] Although not incapable of following the abstract sciences, Clarice had not been raised for them, and was frightened by anything "that sounds and looks like them." She feared that such knowledge might even be socially inappropriate for her sex, like provincial ladies at court mixing a courtly air with their "region's Idiom" (1:2). Her efforts to read bee habits in the style of a "Novel" (1:7) gradually crumbled under Eugène's sententious revisions of what she saw and how she interpreted it. By the end of volume 2, she had been completely integrated into the language of agricultural improvement, prominent in natural history writings until well after the Revolution, even suggesting a project for the propagation of apiculture among her peasant tenants: "I think I have found an easy means of procuring a considerable benefit for my country in this part of its commerce, both by prodigiously multiplying the species which is its object, and by developing an opportunity for succor for the peoples, and for economy in our households" (2:340–41). This "useful and salutary project" (2:352) had both biblical and political implications. Clarice wished "that my land might become, according to the terms of Scripture, *a land flowing with milk and honey*"(2:348) but recognized the need for the "attention of the ministry for the good of commerce" (2:352). What made natural history at midcentury into a project of enlightenment in the eyes of contemporaries was its potential utility; natural historical practice was profoundly political in serving to underpin proposals for "improvement" of the self, of the land, of the nation. In France, as in other European countries, rational improvement and enlightenment were nearly synonymous for many. Appeals to utility were a pervasive characteristic of the many versions of natural history being generated in mid–eighteenth century France, and were especially prominent in writings on the uses of nature for the self-development of the young noble, of which Pluche's *Spectacle de la nature* was one example, and Buffon and Daubenton's *Histoire naturelle,* another.[35]

Natural History: Consumption or Cultivation?

For individuals such as Bazin, de La Chesnaye and d'Agoty, the writing of natural history works was itself a form of commerce, even a domestic industry. D'Agoty sold his colored plates from his home on the rue de La Harpe. The physician-naturalist Pierre-Joseph Buc'hoz, at no. 119 of the same road, was one of the most prolific of natural history writers, selling his collections of plates and treatises on natural historical and medical subjects at around 10 to

34. Bazin, "Avertissement," in *Histoire Naturelle des Abeilles,* 1:xiii–xiv.
35. Pluche, *Le Spectacle de la nature.*

14 livres for each booklet, often from home. Aubert de La Chesnaye des Bois, too, sold his *Dictionnaire de la Noblesse* from home, on the rue Saint-André-des-Arts, between the hôtel d'Hollande and the rue des Grands-Augustins. It was very rare for an individual who taught or curated in natural history for a living to be entirely self-sufficient; most, even those with medical or patronage connections, such as J.-P. Buisson at the Collège de Pharmacie, Jean Descemet and his mother at the Jardin des Apothicaires, or Pierre-Philippe Alyon, tutor to the children of the duc d'Orléans, published as well, or sold specimens.[36]

There are no simple lines of distinction between writers, collectors, curators, readers, merchants, and lecturers, nor between the institutional and domestic practice of natural history, at whatever point along the social scale one looks, except perhaps at the very top. For most members of polite society, efforts to obtain patronage, positions, royal or municipal *titres* and *brevets* often involved publication, since the renown of a protégé reflected upon the patron. The most famous of eighteenth-century French naturalists, Georges-Louis Leclerc de Buffon, traded on the success of his *Histoire naturelle, générale et particulière* to obtain his county; Jean-Baptiste-Pierre-Antoine de Monet, chevalier de Lamarck, a former army officer and vendor of shells, gained his post at the Jardin du Roi under Buffon on the strength of his successful *Flore françoise* of 1779, a new and simple analytical key to all known French plant species. Participation in the literary world was increasingly linked to participation in polite society, so that patronage success and public esteem were coming to be ever more closely articulated.[37] However, natural history was never just literary; it was tied to a whole economy of material objects, which included books and prints, seeds, bulbs, birds, and bones. While some immortalized their patrons or protégés by naming species after them, others, such as Buc'hoz, put them into print. The second edition of his *Nouveau Traité physique et économique* of 1787 was a collection of dissertations, each illustrated with a hand-colored plate of high quality, and each costing two to six livres. Pierre-Joseph-Victor, baron de Besenval, not only headed the list of subscribers

36. Buisson, *Classes & Noms des Plantes* (1779). The Descemet family had its own nursery business: *Catalogue des. . . plantes . . . dans les jardins et pepinières du Sieur Descemet* (1782); and see Alyon, *Cours de Botanique.* Not all such publications actually earned money for the author, but they could also earn recognition and hence patronage. The practice of printing a series of booklets that would be purchased individually and bound by the owner reflected the high cost and duration of the publishing process; if the book failed, the author or publisher would not have gambled away a fortune.

37. Darnton, *Literary Underground.* Darnton, *Business of Enlightenment,* contrasts the condemnation of the first *Encyclopédie* with the royal permission accorded its successor, the *Encyclopédie méthodique.* More direct evidence is provided by the regular appearance of writings by natural historical authors such as Guéneau de Montbeillard, Buffon's collaborator and coeditor of a periodical on the natural sciences from 1754 to 1787, in the *Almanach des Muses.*

at the end of the volume but also appeared, accompanied by the full list of his titles, at the foot of the plate illustrating *Centaurea Calcitrappa.*

Much of the contact of wealthy Parisians with nature was in the urban gardens of nobles, which were comparatively small, even on large properties. Few undertook botanical herborizations into the countryside until the late eighteenth century.[38] The late-1780s *Vues des Principaux batimens a Paris* contained a series of plates that reveal that many gardens thought worth visiting were very public spaces indeed, perfectly visible from the road and from adjoining gardens. The house of the marquise de Brunoy, for example, was shown with many visitors accompanied by their small dogs, parasols, or books, perambulating amid the orange trees in their portable planters and through the hothouses. Gardens were thus exemplary sites for the public display of botanical virtue by nobles, especially as the cultivation of exotic plants increased sharply during the 1770s.[39] They were, above all, locations in which botanical, agricultural, and sensible display were intimately linked; as nobles filled their gardens with plants, they were representing simultaneously the symbolic repossession of the territory of France and its revivification or valorization; their own sensibility toward the beauties of nature and, in consequence, their redemption from the state of urban corruption; and their recognition of the role of natural history and its associated sciences and arts in mediating these two forms of improvement, both of themselves and of the nation.

Natural history could only have come to play so large a part in the repertoire of noble improvement by virtue of the fact that those for whom natural history was a source of income or status were successful in shaping natural history to the methods and manners of distinction in mid–eighteenth century French society. In Buffon's *Histoire naturelle,* much use was made of the literary genre of the travel account, which was widely read in the period, and of innovative stylistic forms that became the model for writing about nature for much of a generation, and opened the doors of the prestigious Académie françoise to the Burgundian naturalist.[40] Likewise, merchants of nature in midcentury well knew that they had to cater for the polite perception of natural history collecting as demonstrating taste, *goût.* Robert-Xavier Mallet's *Beauté de la Nature, ou*

38. Adams, *French Garden,* chap. 5, 125. See also Wiebenson, *Picturesque Garden,* chaps. 1 to 4.

39. *Vues des principaux batimens a Paris.* The *Guide des Amateurs et des etrangers voyageurs* (1788) contained a detailed account of the various scientific establishments, their collections of natural history and anatomy, teaching courses and history, in addition to its descriptions of noble gardens. Also Adams, *French Garden,* 124–25, and Spary, "Making the Natural Order," chap. 2.

40. On Buffon's style, see Lepenies, "Von der Naturgeschichte zur Geschichte der Natur," in *Das Ende der Naturgeschichte.* The preferred reading of nobles was belles lettres and history (Roche, *Les républicains,* chap. 3; Chartier, "Urban Reading Practices, 1660–1780," in *Cultural Uses of Print,* 183–239).

Fleurimanie raisonnée, Concernant l'Art de cultiver les Oeillets (Paris, 1775) was published as propaganda for his flourishing nursery business at the barrière de Reuilly. Mallet, a specialist in pinks, claimed in his preamble to have been cultivating plants for twenty years. He obtained considerable attention in widely read periodicals such as the *Journal de Paris,* which also regularly indicated the flowering of new exotic plants at the Paris natural history center, the Jardin du Roi, and at the Jardin des Apothicaires.[41] This was not merely advertising: it gives an indication of the complexity of the social location of natural history in the period. These vendors of nature took account of their readers' self-perceptions. What was on offer by writers, engravers, or nurserymen in the mid–eighteenth century was, it should be noted, *reasoned* florimania, the reflexive rather than the unmediated encounter with nature. No simple dialectic between nature and enlightenment was being evoked here, but rather one that enrolled fashion in the service of reason, patriotism in the service of natural history, and self-development in the service of commerce. The material objects of natural history, from skeletons and tulips to plates and microscopes, embodied these relations to varying degrees.[42]

The showroom and auction room used over a couple of decades by a successful team of merchants of natural history and the fine arts, Helle and Rémy, was in the rue Poupée, just off the rue Haute-Feuille, in the same small area surrounding the place St. André des Arts, which also housed Buc'hoz, d'Agoty, and de La Chesnaye.[43] In their *Catalogue raisonné,* whose frontispiece is shown in figure 9.3, Helle and Rémy's lengthy "Avertissement" discussed the relations between connoisseurship, value, and knowledge. Their act of putting this "considerable and varied series" up for auction would teach "Beginners the rarity, and even the value of Shells."

> [O]ne acquires more knowledge about the rarity and cost of Shells in a visit [to an auction], than from the sight of Cabinets. From this [latter] study one can learn the name which is given to Shells, inform oneself of its [*sic*] Class or Family, but one will never know well that one species is rarer and more expensive than another, each Owner being in the habit of puffing off what belongs to him, and of judging the rarity of a morsel, either by the price which he paid for it, or by the opinion which he has of it.[44]

41. *Journal de Paris,* 15 June 1778, submission of his own invention, a form of cold frame, for royal approval. Mallet followed this up with his *Dissertation sur la maniere de cultiver des plantes choisies dans le Chassis physique du sieur Mallet* (Paris, May 1778). On its "advertising" of exotic plants in gardens, see, e.g., *Journal de Paris,* May 1778, 483; 14 September 1779, 1047.

42. Compare, also, the discussion in Benedict, "Curious Attitude," which reveals how many different levels of meaning and skill were involved in the appreciation of objects in eighteenth-century British collections.

43. On Helle and Rémy, see Laissus, "Les Cabinets d'histoire naturelle," in Taton, *Enseignement et diffusion des sciences,* 342–84.

Helle and Rémy promised more than erudition; they offered selectivity, based upon their experience trading with Dutch merchants. Their knowledge and expertise concerning the rarity of specimens was proffered for the instruction of "Amateurs," who could then spread specimens rare even in Holland into French cabinets. They backed up their appeal to would-be connoisseurs by promising to include references to the plates in Dezallier d'Argenville's *Conchyliologie,* the principal text on the natural history of shells until the early nineteenth century. The copy of the *Catalogue* used here was one into which the owner had inscribed all the prices of the different lots, so that it is possible to see what purchasers valued most. Among the picturesquely named specimens of the "Ducal Robe," "Butterfly Wing," "Cloth of Gold," "Tiger," and "Chinese Button," what fetched the most money, at over 50 livres the lot, were spiny oysters, followed by "Amirals," "Pourpres," "Damiers," "Bécasses Epineux," "Tuilées," "Cames," and a scattering of others.

The single highest-priced lot, at 1,611 livres, was a *Scalata,* depicted in the *Conchyliologie,* listed by Rumphius. Helle and Rémy devoted a page and a half of description to this one specimen, giving its probable classification, its probable origin, and a reference to a misclassification in another work.[45] From all the descriptions of the rarest shells, one characteristic comes across clearly: most money was paid for shells with a particularly regular shape. The *Scalata,* of course, resembled a staircase, more valuable when it had not been pierced. Color was also very important, and, just as was the case for ornamental flowers such as the tulip or pink, its regular distribution was of prime importance in determining the value of particular species and of individuals within a species. In another auction two years later, Pierre Rémy described the difference between the true and false "Arléquine": the former seemed to be composed of "a number of small pieces of different shapes, some oval, others triangular, all intersected by clear and distinct lines. . . . The false *Arléquine* is worked in approximately the same way, but the pieces and lines are muddled and mixed together, there is no clarity of work to be found here." Here, the geometry so prized by Réaumur and his protégés in the working of insects was clearly equally important to the collector with taste. Although the need to classify and order was not ignored or denied, these suppliers to the midcentury connoisseur subordinated that need to the hierarchy of tasteful discrimination that only they could satisfy, a sure guarantee that the purchaser possessed more

44. Helle and Rémy, *Catalogue raisonné,* vii.

45. Ibid., 13.

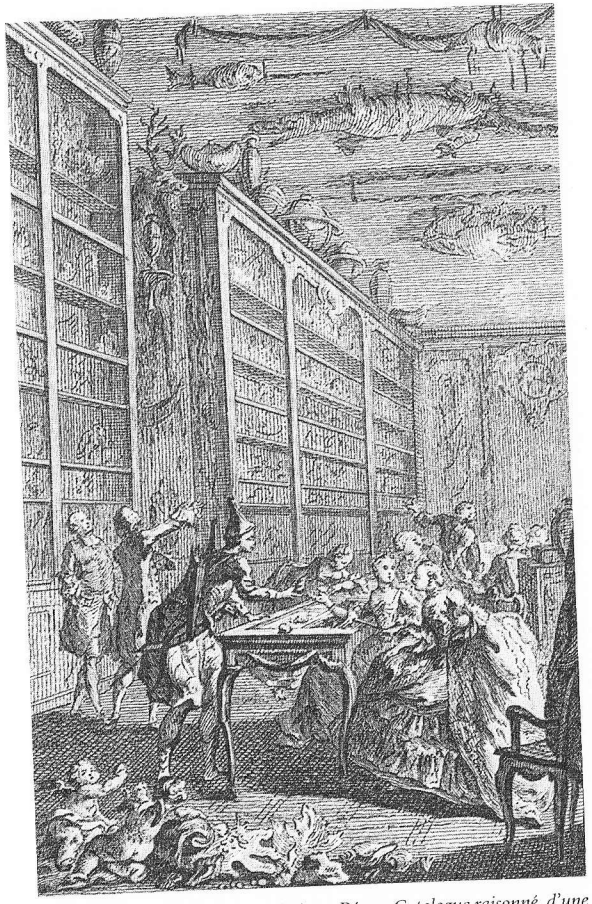

Fig. 9.3. Frontispiece, Helle and Pierre Rémy, *Catalogue raisonné, d'une collection considerable de coquilles rares et choisies* (1757). This depiction of the natural history merchants' showroom, used in all their catalogs, could have been that of the interior of countless other fashionable Parisian shops during the mid–eighteenth century, but for the shells. Compare the illustrations in Brewer and Porter, *Consumption and the World of Goods*. By permission of the British Library, shelfmark 1267.b.34(2).

than mere money.[46] The dual demands of taste and order, however, were linked, for nature was both the source of order (even if that order was inscrutable to human understanding) and of beauty (even if that beauty was also a creation of custom, climate, and fashion). Thus the abbé Favart d'Herbigny's shell guide of 1775 indicated that only a combination of enlightenment and emotional involvement made classification possible at all: "Nothing escapes the enlightened amateur, [who] rightly finds infinite differences among testaceous beings; while those persons who only see them with indifference, imagine that all univalve shells are snails, and all bivalves are oysters and mussels."[47]

The appeal to order was itself made on the same basis of discrimination; many critiques were launched at those who "heaped up" their collections with no notion of what was in them, by those whose existence was enriched by their expertise in ordering, collecting, writing about, or selling natural history. D'Herbigny contrasted the "vague glance" of those who wished to "astound with sophisms, rather than instruct with knowledge" with the expert gaze of cabinet-forming amateurs and conchologists, which could "perfectly distinguish, for example, the *lépas* of the Magellanic coasts, from those of the seas of Europe."[48] It is thus highly important for our understanding of the relation between enlightenment, sciences, and self-perception in France that both naturalists in institutions and natural historical travelers portrayed themselves, not as "professionals" attracted by a "vocation," but in terms such as those of Jean-Christophe-Fusée Aublet: "From my tenderest youth, I have been virtually mastered by a most lively taste for the various parts of Natural History."[49] Aublet ran away to sea, embarking on a ship bound for Spain "without having communicated my plans to my family, for fear that they would prevent me from executing them." Stories of young men defying parental plans for legal, ecclesiastical, or medical training to follow their natural historical "tastes" cannot be construed as tales of developing professionalism of the sciences. Instead, they show that the narratives of self-development that underpinned much

46. Rémy, *Catalogue de curiosités* (1759). Cf. Olmi, "From the Marvellous to the Commonplace"; Pomian, *Collectionneurs*. On the importance of taste from the end of the seventeenth century as engendering a realm in which expertise was possessed by members of polite society, see Saisselin, *Taste in Eighteenth Century France*, chaps. 1 and 4. Even in the Cabinet du Spectacle de la Nature et de l'Art, which for twenty-four sous one could visit every day in the Carrefour de l'École opposite the rue des Prêtres, and which offered such delights as "a Medusa Head adorned with Serpent tails, the Sea Mole, the Salamander which lives in fire, Siamese Butterflies, the sea Horse, a Skeleton of the Hummingbird, the Skin of a Snake, the very fine Bull-Fly," and others, offered a free catalog "for the use of the Public" to increase the instructive effects of viewing. (*Catalogue des diverses curiositez et raretez*).

47. Favart d'Herbigny, *Dictionnaire d'Histoire Naturelle*, lvi.

48. Ibid., xxi, xl.

49. Aublet, preface to *Histoire des plantes de la Guiane Françoise*, 1:i.

natural histor[illegible] writing, and particularly the equation, often made in eulogies, between bei[illegible] in touch with one's own nature and having a taste for nature, were taken a[illegible] literal programs for action, self-presentation, and self-narration by young me[illegible]. Both academicians and connoisseurs continually stressed the possession o[illegible] taste as a valuable quality, the mark of distinction in those who appealed for [illegible]patronage, or as a way of distinguishing a particular "select," "very tastefu[illegible]y composed" collection. Such judgments were made, of course, on the basis [illegible]f repeated social visits to other collectors' houses, visits made possible by [illegible]e continual investment in polite associations, which almost inevitably inv[illegible]ved whole families. In the 1740s and 1750s, Aublet was the student and protégé [illegible]f Bernard de Jussieu at the Jardin du Roi, and of several noble collectors, n[illegible]tably the baron d'Holbach, who "opened his purse and his library to me."[50]

Natural history works were not just guides to ordering, except in a handful of cases; most were also guides for the proper behavior of a naturalist, which was actually the same process as the proper self-development of members of polite society. Alyon, for example, pinpointed botany as the only suitable scientific pursuit for magistrates, military men and financiers as well as the (post-Rousseau) *solitaires* who were led to the sciences by "an irresistible impulse," grounded in their nature, and who were the few destined to make useful discoveries.[51] Many guides to the study of natural history explained the popularity of a science that taught both taste and public utility, civicism, and self-control, by appealing to the innate attraction of nature for humans. All of these aspects were inextricably linked in, for example, the work of Buc'hoz. Referring to his troubled existence following the death of his patron, King Stanislaus of Poland, Buc'hoz borrowed from Rousseau to promise his readers that the study of nature offered "a charm which is only experienced in the full calm of the passions, and which alone suffices to render life happy and sweet; but as soon as a motive of interest and vanity becomes involved, whether in filling posts or in making books, as soon as the goal of learning is only to teach, . . . that of herborizing only to become an Author or Professor, all that sweet charm vanishes: plants just become the instruments of our passions."[52] But the writings of Buc'hoz, Alyon, and others described a particular social world that many readers were eager to enter. Natural history works were often marketed for those who wished to display the attributes of taste and politeness

50. Ibid., iv. See also, for example, Dezallier d'Argenville, *La Conchyliologie.*

51. Alyon, "Des avantages qui résultent de l'étude de la Botanique," in *Cours de Botanique,* 1–4.

52. Buc'hoz, "Dissertation servant de Préface ou de Prospectus," in *Nouveau Traité,* 1–2. This is a verbatim quote from Jean-Jacques Rousseau, "Septième promenade," in *Les Rêveries du Promeneur solitaire,* 131.

but lacked the financial resources or leisure needed for expertise. Thus Favart d'Herbigny, Valmont de Bomare, and Duchesne and Macquer all presented their natural history works as substitutes for the expense of purchasing and tedium of reading countless other works on the subject.

> I thought that I should collect and analyse, in a small number of portable volumes, several methodical systems from the most famous Conchologists of our times, for the benefit of those who might wish to get to know them before purchasing authors whose volumes are expensive, lengthy, [and] often quite rare, which mostly contain all parts of Natural History, and to which one is sometimes forced to resort, even if only to make use of just one part.[53]

Natural historical knowledge was considered a valuable means of self-improvement because its very acquisition repeated the steps of self-development judged necessary for the enlightened individual. One made the transition from natural (the brute) to social (member of polite society) by recapitulating the Adamic process of generating order from an initial perceptual chaos. Here, the trajectory of the individual confronted with nature mirrored that conceptual shift. Buffon's *Histoire naturelle* was heavily recruited by subsequent writers on natural history (including Rousseau) to express the passage from natural to civilized, from chaotic to orderly, from unhappy to happy: "[W]hen one . . . casts one's eyes for the first time on this storehouse filled with diverse, new and strange things, the first feeling which results is an astonishment mingled with admiration." A sense of confusion and inadequacy succeeded, but

> through familiarizing oneself with these same objects, through seeing them frequently, and, so to speak, without design, little by little they form durable impressions, which soon link themselves in our spirit by fixed and invariable relations; and from there we lift ourselves to more general views, by means of which we can embrace several different objects at once; and it is then that one is fit to study in an orderly fashion, to reflect fruitfully, and to clear paths for oneself so as to attain useful discoveries.[54]

One of the critiques of the *Histoire naturelle* scathingly referred to hapless troupes of polite observers wandering around collections, waiting for some "relation" to form out of the overwhelming mass of confusing variety in nature.[55] But such adverse comments had little effect prior to the Revolution. The

53. Favart d'Herbigny, *Dictionnaire d'Histoire Naturelle,* xxxii.

54. Buffon, "Premier discours" from *Histoire naturelle* (1749), vol. 1, in Piveteau, *Oeuvres philosophiques de Buffon,* 8.

55. Lelarge de Lignac, *Lettres à un Amériquain;* and cf. Lepenies, *Das Ende der Naturgeschichte,* whose view of natural historical style is profoundly informed by nineteenth-century interpretations of Buffon.

Histoire naturelle, written for an upwardly mobile readership, was the third most common work in private libraries cataloged by Mornet.[56] Moreover, Buffon, his opus, or his institution were acknowledged in virtually every work on natural history published after 1749 that I have consulted. The *Histoire naturelle* was instrumental in promoting the view that natural history offered a privileged access into the natural foundations of human association, and a route to "natural" development, both physical and moral. The appeal to a "nature" existing beyond society, but forming the bedrock of social interactions and moral and aesthetic standards, was what many readers particularly perceived in Buffon, even if there was little consensus on his political or religious views. However, this separation served a highly social function. Buffon used animals as illustrations of normalized social relations throughout the volumes on the quadrupeds, in descriptions of *moeurs* or habits, which gave prescriptions for "normal" behavior in categories defined according to hierarchies of perfection, gender, climate, or race. Female animals were good or bad mothers; male animals were free or enslaved (domesticated) and therefore perfect or degenerate accordingly. It was this slippage between the natural and the social that defined natural history's power to work on the social world.[57]

Policing the Natural

The natural was the pivot for a range of social maneuvers, both serious and satirical. The conjunction of the universalizing claims of enlightenment and the classificatory authority of natural history writings had, by the 1780s, generated a space in which the natural could be used to make objects unnatural or supernatural. Many who study the French Enlightenment are familiar with the social and political reform proposed on the basis of the laws of nature in such works as d'Holbach's *Système de la nature* (1770) or Helvétius's *De l'Esprit* (1757). Less well known is the French version of Ignaz von Born's satire on monks, *Joannes Physiophili Specimen Monachologiae* of 1783, which was revised and translated by the permanent secretary of the Paris Société Royale d'Agriculture, Pierre-Marie-Augustin Broussonet (1761–1807). In the *Essai sur l'Histoire naturelle de quelques especes de moines, décrits à la maniere de Linné,* Broussonet, alias "Jean d'Antimoine," turned natural history's technologies of natural order to the monastic orders. The satire drew its force in particular through Broussonet's claim that he was writing from the "Cabinet du Grand

56. Mornet, "Les Enseignements des bibliothèques privées." Marion, *Recherches sur les bibliothèques privées,* indicates that within the first decade after publication, Pluche's *Spectacle de la nature* was the only work of natural history to feature in the top one hundred most frequently read works in Paris; Buffon's work did not appear. However, Darnton, *Literary Underground,* chap. 6, questions the value of such figures as evidence of what was actually read.

57. See Thomas, *Colonialism's Culture,* chap. 3; Schiebinger, introduction to *Nature's Body.*

Lama": from a non-European perspective, monks were evidently not human.

But the success of the parody turned on Broussonet's (and Born's) perfect mimicry of the style and content of so many natural history books published over the course of the century. The book thus became at one and the same time a critique of monasticism and an effective mockery of the very foundations of natural history. Broussonet's much expanded preface pointed to the benefits for natural history of the modern flowering of the arts and sciences; to the growth of collections through voyaging; and to the difficulty of obtaining and preserving rare specimens: "Among the rarest species, and which would be most difficult to procure for oneself, I include a Grand Lama, an Abyssinian, a Mufti, an Armenian Patriarch and some others. But a part, such as powdered dung from the Grand Lama, a slipper, &c., would suffice, or one could try and get the stuffed individual, or better still preserved in spirit of wine." "Jean" appealed to the patriotism of naturalists and rulers to promote the study and collection of specimens. Broussonet even added a narrative of emotional commitment to natural history for greater verisimilitude:

> I have loved Natural History since my earliest childhood, and I gave myself over to it with ardor, but I do not possess the means to travel; only being able to make a very mediocre name for myself, I turned my attention toward man, I made an in-depth study of our species. I devoted myself to determining the different varieties of the human race.
>
> At first I studied with care the diverse species of animals which approach man most closely in their form, and I established their differences. Having passed under review the Monkeys, the *Sapajous,* the *Guenons,* the *Satyrs,* the *Fauns,* the *Mermen,* &c., I discovered by accident some species of a very vast genus. The *Monks,* to which I refer, offered me the link which serves to unite man with the Monkeys; the species of this genus have a human face; apart from that, they differ essentially from man.[58]

There followed, in the main body of the text, a series of descriptions in the Linnaean style of different monastic orders, such as the Benedictines, Franciscans, Capuchins, each accompanied by accounts of their "Animal Œconomy" and plates depicting the different "parts" of monks (hoods, beards, sandals, belts, habits, etc.) and by a list of earlier writings on the same subject. The effectiveness of this parody rested, of course, upon the "naturalizing" effect of the techniques of natural history; through systematizing, describing, the study of habits and parts, a social phenomenon was made to seem funny and degraded—in other words, *unnatural.* Only the extreme faithfulness of the

58. Broussonet, *Essai sur l'Histoire naturelle de quelques especes de moines,* ix, iii–iv.

Broussonet/Born satire to genuine natural history treatises enabled the joke to work.

In the year that Broussonet's translation of Born appeared, the same strategies were inverted against the royal family, and later against monarchists in general. In a caricature entitled "The Harpy, a living Amphibious Monster," Marie-Antoinette was under attack from the courtly faction of the comte de Provence, Louis-Stanislas-Xavier, brother to Louis XVI, otherwise known as Monsieur.[59] The accompanying "Historical Description of a symbolic monster taken alive on the shores of Lake Fagua, near Santa Fe . . . " was a fake discovery of a wild beast in Chile that exploited a particular tradition of engraving, commemorating the discovery of real and fake "beasts" and "monsters," existing throughout the century. Naturalists were called in to legislate about the authenticity of such discoveries and of public displays of spectacular specimens. Revolutionary caricaturists exploited nature to the full by composing monstrous representations of the queen, the royal family, and aristocrats out of two or more natural objects, whose juxtaposition rendered their subject unnatural. Such images crossed the dividing lines between symbolic and literal representations of the natural to engender a set of unnatural or supernatural representations that shattered social power. Marie-Antoinette's condemnation to death ultimately rested upon the many accusations of unnatural sexual liaisons with various courtiers and even with her son.

Conclusion

The fact that such different views of, and uses for, the terms "enlightenment," "nature," and "modernity" could be generated within a few years of each other and within a few hundred square yards of the same city should enforce upon us in the strongest sense Daniel Roche's insistence that we should no longer "read the *Lumières* by the light of the Revolution alone."[60] It is curious that although natural history was the discipline to which almost everyone who wished to comment on nature appealed, and which captured a range of individuals, professional writers, institutional botanists, curators of collections, and the wealthy curious, it has barely formed a part of writings on the relationship between nature and enlightenment. Even in the histories of nature it has been largely absent, being replaced by a mythical science of biology.[61] It is particularly revealing that natural history should be thus edited, cropped, divided, or annihilated, for it of all disciplines formed the common ground for relating claims about enlightenment to claims about nature. Such revisions indicate

59. Described in de Baecque's insightful *La caricature révolutionnaire*, 186.
60. Roche, *Les républicains*, 16.
61. See, in particular, Roger, *Les sciences de la vie.*

the great difficulty modern readers have had in coming to terms with the meanings of nature and enlightenment for eighteenth-century practitioners. In eighteenth-century French natural history, "science" and "sentiment" were not distinct; the division manifest in Daniel Mornet's two classics, *Le Sentiment de la nature en France de Jean-Jacques Rousseau à Bernardin de Saint-Pierre* and *Les Sciences de la nature en France, au XVIIIe siècle,* is of nineteenth-century origin. Only by creating such distinctions have historians been consistently able to affirm the marginality of studies of the social world for an understanding of intellectual practices. Even in social histories of the eighteenth century, writers have felt obliged to treat the sciences as somehow demanding special historiographical tools, separate chapters, a particular "specialist" language: in other words, the conceptual isolation of the sciences is reinforced by a methodological, linguistic, and physical isolation.[62] Since the end of the eighteenth century, the links that existed in natural history between taste and reason, connoisseurship and utility, sensibility and scientificity were progressively cut to fit subsequent categories; and conforming to these nineteenth-century concerns, historians have paid little attention to natural history as a cultural whole. Most of the sources I have used in this paper are by individuals now regarded as marginal or irrelevant to the "real" history of eighteenth-century natural history; going through a substantial list of mid-eighteenth-century French writers on *histoire naturelle,* I came to the conclusion that this judgment included virtually every writer on that subject who published between 1740 and 1790, with the exception of Buffon. Historians had evidently been more interested in what was being written about "specialist" subjects—botany and zoology in particular—than in the works that helped to shape the meaning of *histoire naturelle* for French polite society. It cannot be irrelevant, however, that only the widespread recognition of the existence of such a discipline as *histoire naturelle* by legislators from all parts of France—many of whom explicitly cited Buffon as their hero—opened institutional opportunities, lacking for other sciences over several years, for natural history to be practiced and taught, to be closely associated with national pride, public utility, and the preservation of civility throughout the early nineteenth century.[63]

62. Even in Charlton's otherwise rich social history of the natural in eighteenth-century France, the "history of biology" model was so compelling that in his chap. 4, "Sciences of Nature," the eighteenth century appeared as "the first age—the so-called age of empiricism—when scientists really looked at nature closely, in all its complex and many-sided realities and established the crucial role within science of experimentation." Charlton saw the period as the time of the "rise" of "new sciences" such as "geology, botany, biology and zoology, even if in some cases the name of the new science would not be coined until the following century" (70). Thus, the result of the history of biology is effectively to deny the existence of natural history.
63. See Spary, "Making the Natural Order," chap. 3.

Throughout this account, I have been relying upon materials—published texts, natural history specimens, and a collecting public—that have been taken in different ways to capture the link between the eighteenth century and modernity. The work of a growing body of historians of eighteenth-century consumerism stresses the success of changing patterns of commerce and credit in opening up new marketing strategies and financial opportunities well before the "Industrial Revolution." This approach, although very valuable in many ways, is problematic for the case of natural history. As I have shown above, naturalists, whether institutionalized or not, universally linked commerce with distinction, wealth with civicism. Natural historical practices united taste with utility. For the case of France, at least, it is too simple to suggest, with Brewer, that *financial* trustworthiness was the principal underpinning for the use of polite forms of address; natural history enrolled too many kinds of social and intellectual distinction to be reducible to such a scale.[64]

But can one recognize through a study of eighteenth-century natural history the development of an independent public sphere of the form envisaged by Habermas? The answer is, again, no. For the *practice* of natural history simply inverts or collapses many of the categories Habermas sought to use as a way of explaining the process of generation of modernity. It was precisely the domestic property of certain technologies of art and nature that the d'Agoty family exploited simultaneously as a commodity, as a means of regulating relationships in its "internal space," and as a way of gaining entry into the polite world. The polite world was not just the "market of culture products" but also simultaneously the "courtly-noble society" and (by virtue of the fact that some hierarchies of patronage coincided with the hierarchies of government) the "state."[65] There was no inevitability about the separation of these social spaces inherent within the practice of natural history prior to the revolution. What a mixing of Habermasian categories natural history reveals! The notion of "enlightenment" in France reflects a similar situation. It seems that both enlightenment and nature must be understood on several levels at once: as commodity, technology, sensibility, mode of self-presentation, and social hierarchy. "Enlightenment" could be a descriptive category, an evaluation of the state of being of the self and of the other, but overridingly it was a prescriptive category, in which normative forms of comportment were being established. The appeal to nature facilitated and legitimated these classificatory acts. But that appeal also enabled the sidestepping of competing sources of power, allowing earlier models of nature to be dismissed, old regime forms of

64. Brewer subordinates social to commercial credit-worthiness. See "Commercialization and Politics," in McKendrick, Brewer, and Plumb, *Birth of a Consumer Society*, 214.

65. For all these distinctions, see Habermas, *Structural Transformation of the Public Sphere*, 30.

association to be devalued, and even, ultimately, the disorders of Revolution to be naturalized.

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PART

4

Provinces and Peripheries

From Carolus Linnaeus, *Flora Lapponica* (Amsterdam, 1736).