Colonial Botany

Science, Commerce, and Politics in the Early Modern World

EDITED BY LONDA SCHIEBINGER AND CLAUDIA SWAN

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Chapter 6

Global Economies and Local Knowledge in the East Indies

Jacobus Bontius Learns the Facts of Nature

Harold J. Cook

> *Besides, every Malayan woman practices medicine and midwifery with facility; so (I confess that it is the case) I would prefer to submit myself to such hands than to a half-taught doctor or arrogant surgeon, whose shadow of education was acquired in schools, being inflated with presumption while having no real experience.*
>
> —*Dr. Jacobus Bontius,* De Medicina Indorum

One of the most important aspects of the so-called scientific revolution in Europe was the accumulation of detailed information about natural things and natural events. Numerous early modern accounts stress that before speculating about the underlying processes of nature, one had to know the things experientially. Such careful description often went by the name of "natural history," a rubric under which even famous astronomers in later centuries placed their work.[1] Recently historians have paid renewed attention to the importance of the "big science" that was descriptive natural history,[2] and to the "matters of fact" that became so important to the understanding of nature.[3] Europeans wanted to assemble accounts of all of nature so as to know it completely, for the sake of truth and benefit. To find things out, they made inquiries among local informants wherever they went, including craftsmen, alchemists, medical empirics, herb wives, engineers, shipwrights, and many others closely involved with things and their uses.[4] After all, the accumulation not just of things but of information—accurate information—was essential to commerce. People who promoted trading ventures depended on finding, gathering, and redistributing the products of nature and on knowing all about them and their uses. As one economic historian of the Eu-

ropean trading companies put it, "the supply of accurate information must have been one of the first things one expected of a clever merchant."[5] The letters they sent home to their associates while abroad indicate just how active they were in accumulating information about people, places, prices, and ways of evaluating the quality of the goods available for purchase. (See Anke te Heesen's essay in this volume, on the adaptation of financial accounting practices in natural history.) For the hardheaded merchant and other men trying to plan to their advantage, the foundation of true knowledge lay not in debating general premises or conclusions but in accumulating precise and accurate information.[6] Thus, in the first period of globalization, which linked the silver mines of Peru with the spice trade of Asia and the gun foundries of Europe, a worldwide natural science rooted in descriptive natural history also developed for the first time. Nonetheless, how people composed accounts of these matters of fact is not always clear, requiring us to reassess "the process by which authorship is attributed to matters of fact in science."[7] What follows is an examination of one such author's work, noting the importance of local informants in supplying him with knowledge, his debt of respect to them for doing so, and the kinds of information he drew from what he learned.

The patterns of knowledge acquisition germane to early modern global natural history are worthy of close study. On the one hand, authors had to interact with other people both at home and around the world in order to acquire knowledge. On the other hand, when they acquired it, they took only what they wanted, mainly information about description and use. In both respects, authors acted in ways similar to those of merchants who accumulated and exchanged goods. (See also the essays in this volume by Claudia Swan on collecting *naturalia* and E. C. Spary on the difficulties of transforming knowledge of particulars into universalized science.) Many of the best examples of contributions to descriptive natural history can be found among the activities that occurred under the aegis of the Dutch East India Company (Verenigde Oostindische Compagnie, or VOC). The Gentlemen Seventeen—the governors of the VOC in the Netherlands—sometimes even encouraged such efforts. Despite the violence of the VOC's efforts to monopolize the spice trade (see the essay by Julie Berger Hochstrasser in this volume), employees of the company produced some of the most important works on early modern medicine and natural history of the New World, Africa, and Asia. Several members of the company became famous for the publications that issued from their work under the VOC. The most renowned of the Asian natural historians included Hendrik Adriaan van Reede tot Drakenstein (1636–91), who investigated the Malabar coast of South Asia; Paulus Hermann (1646–95), who studied Ceylon and

nearby regions; and Georgius Everhardus Rumphius (1628–1702), who wrote on Ambon and places nearby in the Indonesian archipelago.[8] Other writers with more explicit interests in medicine, such as Jacobus Bontius (1592–1631), Andries Cleyer (1630s–late 1697 or early 1698), and Willem Ten Rhijne (1649–1700), also produced landmark works of descriptive natural history.[9] These authors' efforts deploy similar rhetorical devices as well. They share the quality of conveying matters of fact as if newly discovered, although careful examination reveals that their accounts were written on top of erasures, as in a palimpsest. While European authors often represented their observations as unique, personal experiences garnered independently of any help by agents of other knowledge systems, it seems that the most important means for acquiring new information actually involved contact with other people and familiarity with their experiences and accounts. In their various publications these European authors all similarly reinscribed conversations with local people in the language of commensurable matters of fact.

The work of Jacobus Bontius, who died in Batavia (now Jakarta) in service to the VOC, is exemplary of this process, a process we may come to understand as exemplary of natural history at the time of the so-called "Scientific Revolution." The Gentlemen Seventeen appointed Bontius physician, apothecary, and surgical inspector of the VOC territories in August 1626. The VOC had previously employed ships' surgeons, and a few physicians had also been sent out to certain large stations, but Bontius was given a general remit to oversee all of the VOC's medical affairs in Asia. This appointment served Bontius's ambitions in turn, for as he later remarked in a letter to one of his brothers, he expected that his travels, writings, book collection, and exotic botanicals would earn him a professorship in the Leiden medical faculty, a position both his father and his eldest brother had held.[10] Bontius set sail with the outbound fleet on 19 March 1627 accompanied by his wife and two sons, and reached his destination on 13 September, having lost his wife en route.[11] During his stay in the Dutch East Indies, Bontius suffered many bouts of illness, especially during two sieges of Batavia in 1628 and 1629, when he contracted dysentery, beriberi, and other serious diseases. Bontius also suffered many personal losses in Batavia: his second wife, whom he had married shortly after his arrival, died on 8 June 1630 of "a vehement cholera"; his eldest son died at the beginning of 1631 of "kinderpoxkens" (perhaps measles); and the deaths of friends and acquaintances are mentioned several times in passing in his works.[12] Not only were his personal sufferings great and his medical duties relentless, but he was assigned additional responsibilities as well. Between the sieges of 1628 and 1629 he became a member of the Court of Justice, the highest judicial body in the Dutch East, and in 1630 he assumed the mantle of chief

law officer for the Dutch Indies, *Advocaat Fiscaal*. He also served as bailiff of Batavia from 15 October 1630 to 18 January 1631, finally giving up the ghost on 30 November 1631.[13]

Despite heavy duties and considerable suffering in body and mind, Bontius assiduously investigated the medicine and natural history of the region. His *Methodus medendi qua In Indiis Orientalibus oportet* (On the Proper Treatment of Diseases of the East Indies)[14] was, according to the 19 November 1629 dedication, completed immediately after the lifting of the second siege. It describes nineteen major diseases of the belly, chest, and skin observed in the East Indies but unknown in the Netherlands. At the same time the work celebrated the ways in which local diseases found their remedies in local plants, a common medical point of view that emphasized the beneficence of nature: "Where the diseases . . . are endemic, there the bountiful hand of Nature has profusely planted herbs whose virtues are adapted to counteract them," he commented.[15] By the time Bontius composed his dedication he had also begun a work on the natural history of the region, which he seems to have considered his major task. According to a later letter to his brother (apparently written on 18 February 1631 and printed as a preface to his first four works, published in 1642), he set out to acquire knowledge of the plants and especially the spices of Java immediately on arriving. The dedication addressed to the Gentlemen Seventeen in his *Methodus medendi* expressed his continuing devotion to their service, which would be even more evident, he promised, when he had finished his "commentaries on the shrubs, trees and herbs which grow in Java." In the same work he lamented, "And would [that] this disease, which has laid me low for about four months . . . have permitted me to travel around the countryside to freely explore the delightful woods of Java and gain an exact knowledge of the many most noble herbs that are here!"[16] Perhaps even from the start, then, but certainly no later than his recovery from the effects of the second siege, Bontius kept a record of his observations on natural history, in both words and pictures.

Some of Bontius's observations on natural history appeared in a second work, his *De Conservanda Valetudine. Seu de diaeta sanorum in Indiis hisce observanda Dialogi* (On the Preservation of Health: Or Observations on a Sound Way of Life in the Indies in the Form of a Dialogue), which he finished on or before 18 January 1631.[17] The *Conservanda Valetudine* is modeled after the famous work of a physician who had lived and worked in Portuguese India more than half a century earlier, Garcia da Orta (c. 1501–68), who published *Colóquios dos simples e drogas . . . da India* (Colloquies on the Simples and Drugs of India) in Goa in 1563.[18] (On the influence of da Orta's text, see the essay by Daniela Bleichmar in this volume.) Da Orta's work took the form of a dialogue, in the

course of which he discussed the uses of what he considered to be the most important medicinal plants of Asia. As Guy Attewell has shown, da Orta had taken the opportunity while in Goa to learn some Arabic, and in his book he criticized classical Greek and Latin sources sharply because their authors were ignorant of most of the medicines and spices of Asia.[19] While few copies of da Orta's book appear to have made it back to Europe, a young Flemish naturalist picked one up during his travels in Portugal and in 1567 brought out a heavily edited and annotated edition of it in Latin.[20] This edition, by Carolus Clusius (1526–1609), made Clusius's reputation as a botanist and remained the standard work on Asian botany for several generations—until Bontius's work appeared. (For more on Clusius, see the essay by Claudia Swan in this volume.)

Like da Orta's *Colóquios*, Bontius's "On the Preservation of Health" takes the form of a conversation organized around the familiar medical theme of the six non-naturals, or environmental and personal habits that can support health or cause disease.[21] Bontius is almost as critical of da Orta as he had been of the ancients. For asserting that the Javanese and Indians attribute to pepper a cold quality, Bontius disparages da Orta as "again ridiculous." In the same dialogue Bontius writes that da Orta mistook the uses of *calamus aromaticus* (sweet flag [*Acorus calamus*]), for although he "knew no other use for it or the sweet smelling reed in India than as bedding for horses, if he had truly been as diligent in investigating the qualities of aromatics as he was discerning in reading Arabian physicians, he would not have been ignorant of the uses of that plant, for throughout India both fish and meat are cooked with a bit of *calamus aromaticus* or the sweet smelling reed, both to improve their flavor and to invigorate the stomach."[22]

Immediately after finishing "On the Preservation of Health," Bontius undertook a more systematic review and critical commentary of the work of da Orta, in which his views are somewhat tempered. He completed the study by February 1631; it was later published as *Notae in Garciam ab Orta* (Notes on Garcia da Orta).[23] When he surveyed da Orta's work as a whole rather than select excerpts from it with which he disagreed, Bontius was much less critical of his predecessor. Ultimately, his *Notae* offers gentle correctives or supplements to da Orta's findings. For instance, da Orta remarks that those who use opium appear drowsy, and Bontius tempers his implied criticism of the drug, for "if we did not have this opium and opiates the prospect in this very hot region of making medicines to treat dysentery, cholera, ardent fevers, or other bilious diseases that swell the organs would be frustrated." Bontius also added considerable information. For example, da Orta confessed that he had not seen *assa foetida* (*Ferula assa-foetida*), "called 'Hin' by the Javans and Ma-

Figure 6.1. The title page of the 1693 Dutch translation of Willem Piso's work *Oost- en West-Indische warande* (East and West-Indian Veranda) depicts a European physician (holding the urine flask) and a surgeon (with his instruments) in conversation, with several Asian people asking for help and, in the background, a view of the interior of a hospital. The engraving appears to refer to the "Dialogues" between Bontius and his surgical friend Duric, held in front of the hospital at Batavia, and may be based on a contemporary drawing or painting now missing. L. S. A. M. von Römer, *Historical Sketches*, trans. Duncan MacColl et al. (Batavia: Far Eastern Association of Tropical Medicine, 1921), 28–30, argues that the upper part of the physician's face shows a strong family resemblance to extant portraits of Bontius's brothers, Regnerus and Willem. By permission of The British Library.

layans," so Bontius described it. Likewise, when discussing ivory, da Orta confessed that he had never seen a rhinoceros, while Bontius had "not only seen them a hundred times hiding in their lairs, but also wandering in the woods," which gave him an opportunity to give the reader an account of one fearsome encounter with the beast.[24]

Bontius's last work, however, better represents his methods of gathering information. This was the promised natural history of the region, which remained unfinished on his death in 1631, although he had worked on it for two or three years and it was beginning to come to completion.[25] In a letter of 18 February 1631 to his brother Willem he told him to "expect next year, if the power of life remains, a full description of plants, shrubs and trees, with a delineation of each drawn from life."[26] Unfortunately, Bontius did not retain his power of life. But many years later, in 1658, Willem Piso (1611–78) published Bontius's medical works in conjunction with his own natural history material and work on Dutch Brazil by himself and Georg Marcgraf (1610–43) in a composite, voluminous, illustrated edition on the medicine and natural history of both Indies.[27] Piso's *De Indiæ Utriusque Re Naturali et Medica* thus preserves Bontius's final efforts in published form. The natural history material attributed by Piso to Bontius contains information on thirty-three animals and sixty-two plants. A large portion of Bontius's original material, on which Piso's account is based, survives in manuscript in Oxford, where I rediscovered it among the papers collected by the early eighteenth-century lawyer and keen botanist, William Sherard (1659–1728).[28] These manuscript materials contain information on sixteen animals, birds, and fish and forty-two plants, in random order. Most of the information on particular specimens includes illustrations together with descriptions and commentaries on the facing or following pages; one long textual description (on the tea plant) lacks any illustration. Presumably, yet another manuscript volume, still missing, contained similar information on the additional animals and plants. A comparison of the printed version and the surviving manuscript reveals that Piso reordered Bontius's material, did some light editing of the Latin, added introductory poems and occasionally additional information, and even introduced a few new items, some based on new information from witnesses who had been in the East Indies.

Bontius's descriptions of animals are full of interesting anecdotal as well as morphological information. Some specimens he had to hand: Bontius kept the skin of a thirty-six-foot snake he killed in the woods at home; his observations of the chameleon were based on one he kept "in a case [*cavea*] at home"; and he also had a flying lizard, "which measured three quarters of an ell" (probably meaning a Flemish ell, which would make the lizard about twenty inches long) and which "can fly,

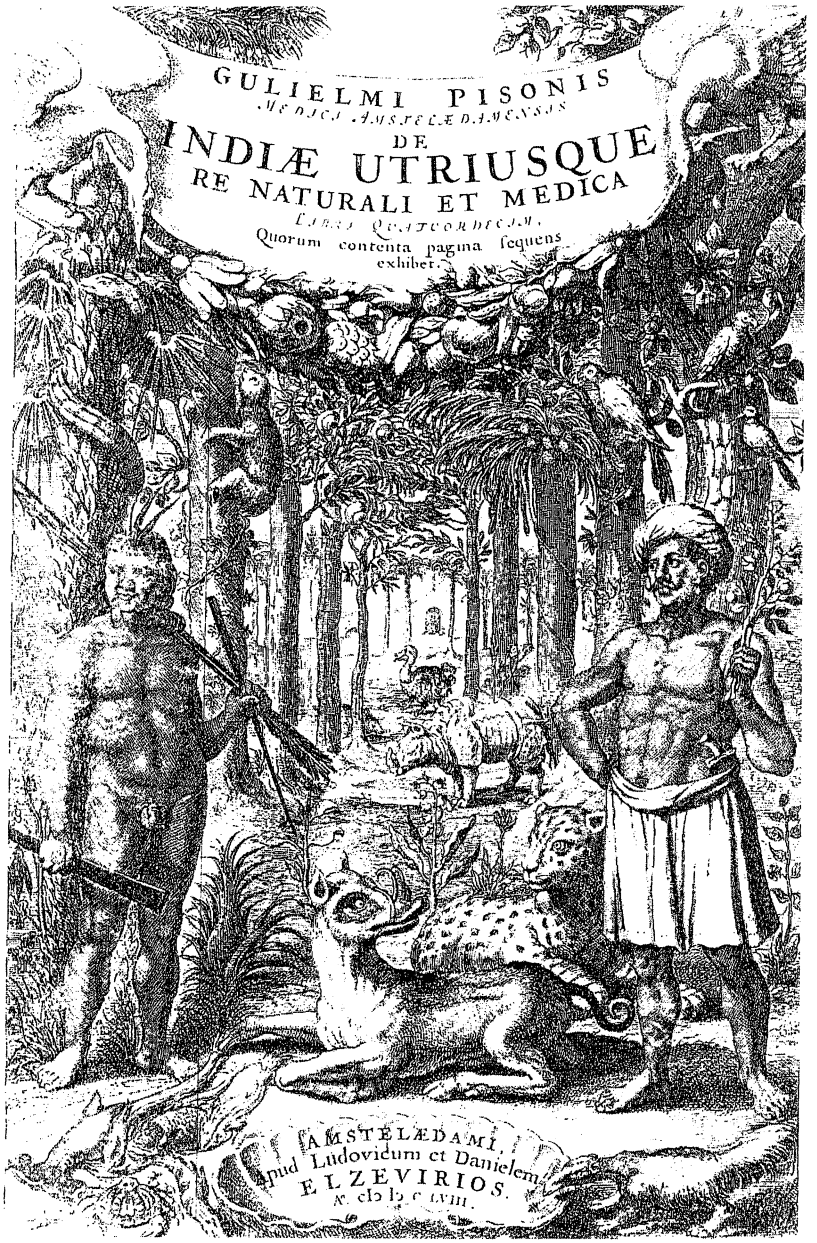

Figure 6.2. The title page of Piso's 1658 edition, which printed Bontius's natural history text and illustrations for the first time. Some of the latter (of the dodo and the rhinoceros) are depicted prominently in the center. By permission of the Wellcome Library, London.

Figure 6.3. A drawing of a tiger in Bontius's notebook by his friend Governor-General Specx. In the entry on the animal Bontius mentions that a "tremendous" one was caught and killed just outside the city wall in May 1630 in the presence of Specx. The annotations are probably by Bontius and include a note for the printer on which chapter the illustration should accompany in Piso's reordering of the material (it appeared in print as chapter 2 of book 5 but occurs randomly in the middle of Bontius's notebook). The annotation reads, "Tygris, quam Radja Outang / Hoc est regem Sylvis indi vocant / Cap. 2" (Tiger, called in India "Raja Outang" or "King of the Woods," Chapter 2). By permission of the Plant Sciences Library, Oxford University Library Services.

but does not persist in flight for long . . . reaching forty paces, or in turn thirty, just like flying fishes." He kept birds of various kinds in his back garden and thought it a "great pleasure" to observe the speed of house lizards when they pursued flies and ants.[29] He mentioned going into the woods when possible and even being squirted in the face with black ink by a cuttlefish he picked out of the water, much to the amusement of onlookers.[30] A few animals he dissected. As for the plants, the ones he described were almost entirely medicinals, along with a few cooking herbs; Piso added a general chapter on flowers, in which he cites a source who comments that the Javanese and all Muslims are fond of fragrant flowers and perfumes.[31] According to Bontius's letters, most of the drawings were executed by a cousin, Adriaen Minten (dates unknown), whom he employed with the permission of the governor-general (as would have been necessary to transfer a VOC employee to another job), but since Minten did not work hard, Bontius arranged to have him sent back home.[32] Presumably, some of the drawings were done by tracing

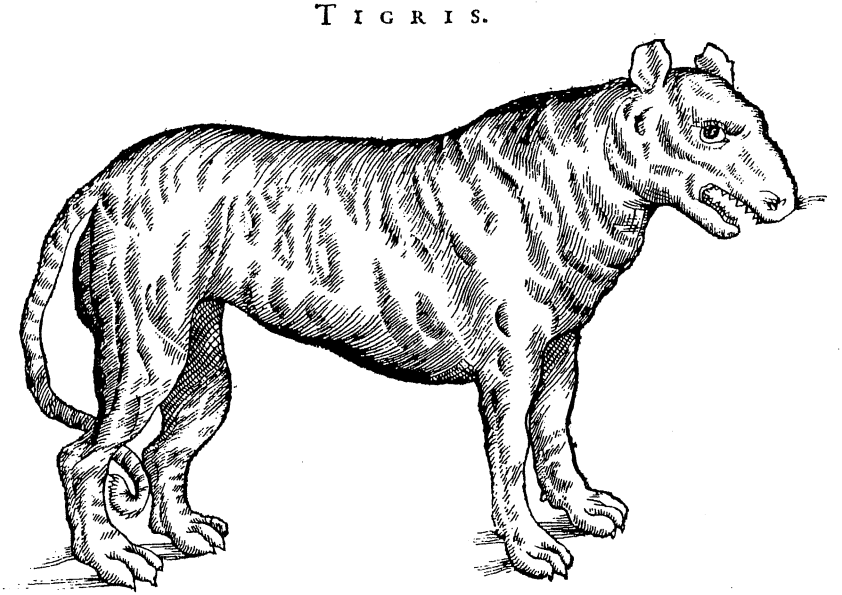

Figure 6.4. In the print in Piso's book made after the drawing, the background is eliminated although some shading under the feet is retained, while the engraver's rendering of the tiger's stripes looks more like the shading of musculature. Reproduced by permission of the Wellcome Library, London.

the contours of a specimen on a piece of paper, after which the details were filled in: Bontius describes this method going awry in the case of the gecko on account of the animal's sticky feet.[33]

Perhaps the most important description was of the tea plant. Acting Governor-General Specx (c. 1588–after 1638), who had spent a long time in Japan for the VOC and had seen it growing there, told Bontius tea was a shrub; until then, Bontius had heard conflicting opinions as to whether it was an herb or a shrub from Chinese sources. In Bontius's manuscript, however, this is one of the few accounts that are not illustrated. Bontius explains why: "I could never manage to see the green leaves here," since it was grown elsewhere and imported in dried form. "It is certainly true that it undoubtedly encourages good health and as a medicine acts not unhelpfully to rid the chest of thick phlegm." With its "excellent diuretic properties," tea also "acted as a fine remedy against bladder and kidney stones."[34] By the time Piso published Bontius's natural history, he had access to a drawing of the shrub provided by François Caron (1600–1673), who had been one of the commanders of the Dutch station in Japan following Specx, to which Piso also

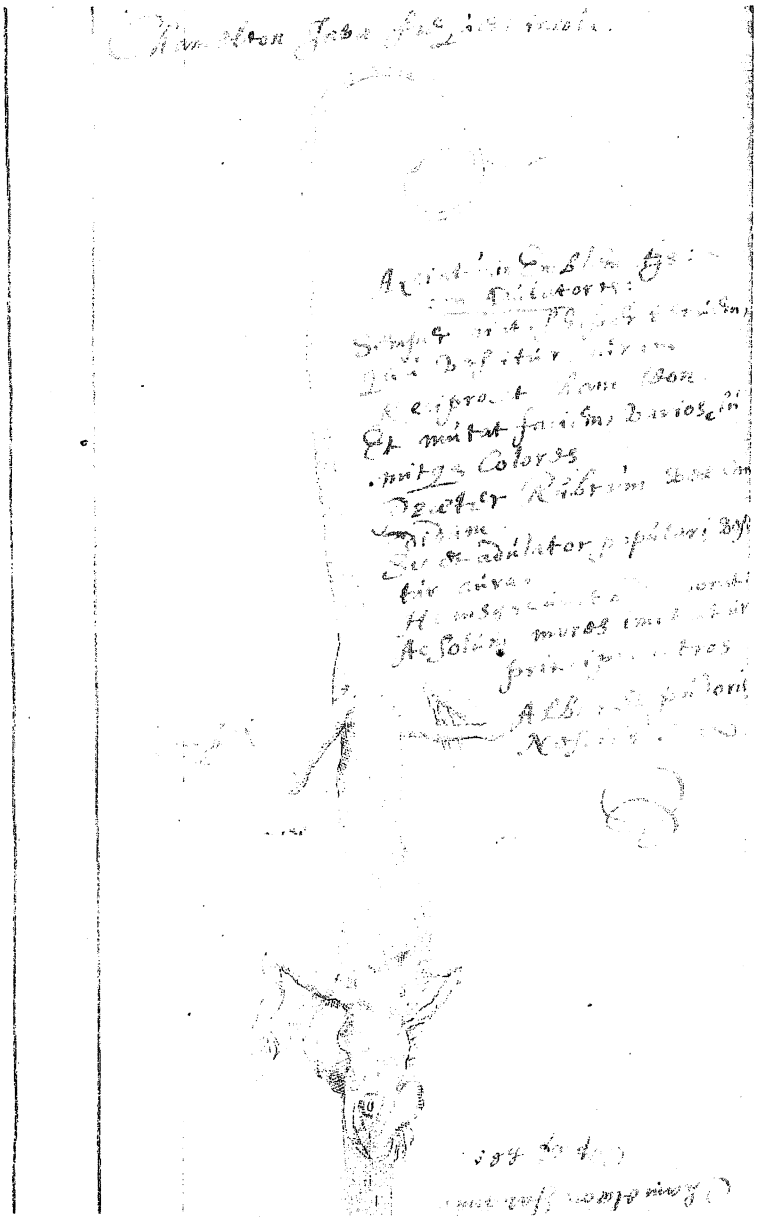

Figure 6.5. A depiction of a chameleon (the caption at the top reads, "Chameleon, a common inhabitant of Java") with a quotation from Alciati's *Emblemata* down the right side, also reproduced in the printed text; the illustration appeared in the book in a horizontal rather than vertical alignment. By permission of the Plant Sciences Library, Oxford University Library Services.

Figure 6.6. The first illustration in the notebook, a careful rendering of a fruit called the Durion, Jaaca, and Champidacca (now known as durian), drawn as if hanging from a tree. By permission of the Plant Sciences Library, Oxford University Library Services.

Figure 6.7. The same fruit, in Piso's book; the illustrator has preferred the durian to be stretching upward. Reproduced by permission of the Wellcome Library, London.

added further valuable information he had collected on tea and its properties.[35]

Bontius proclaimed of all his works that they were based on experience alone. In the *Methodus medendi*, for instance, he wrote that all the treatments he recommended were affirmed by practice, seen with his

own eyes, and judged to be true.[36] His claims for autoptic empiricism did not prevent him from drawing on previously published texts as well, however. As we have seen, he cited and commented on da Orta extensively. He also incorporated passages from the works of all conceivable predecessors in the domain of Asian medicine and natural history: he cites Pliny's *Natural History*; Pierre Belon's *Les observations de plusieurs singularités* (first published in 1553) on the natural history of the Near East; Cristóbal Acosta's *Trata de las drogas y medicinas de las Indias Orientales con sus plantas* (1578), which is almost entirely derivative of da Orta; Prosper Alpino's *De medicina Aegyptiorum* on Egyptian medicine and botany (first published in 1591); and Jan Huyghen van Linschoten's famous Dutch *Itinerario* (1596) on Portuguese Asia (see Claudia Swan's chapter in this volume for more on this). He also mentions Andrea Alciati's *Emblemata* (first published in 1531) and a book by Pedro Texeira on the history of the kings of Persia, and he quoted from Horace, Juvenal, Martial, Virgil and—several times—the Roman playwright Plautus. Bontius clearly had a small library with him and may even have brought along the whole of his sizable collection of over two thousand books.[37]

While Bontius regularly incorporated textual references, in his later writing he also acknowledged that he depended on informants. Especially when it came to discovering the uses of things, most of his information came from other people, although he merely hints at how he went about obtaining it. One source available to Bontius from the beginning was the information accrued over time by European medical practitioners, especially ships' surgeons. Moreover, Bontius might also have gotten information from the official midwife appointed by the council in 1625 and paid to serve the needs of poor Dutch women, although he does not mention her.[38] Bontius does refer to merchants as sources—as, for example, when he corrects da Orta's identification of *assa foetida*; Bontius writes that he had acquired the second of its two varieties, "given to me by an Armenian merchant friend, who brought them out of Persia." Writing of the origins of bezoar stones, he credits Persian and Armenian merchants who gave him information "completely faithfully." Of a medicinal substance called "tutty," Bontius writes that it was produced by calcining a "glutinous earth," which "Persian and Armenian merchants who come here to negotiate business" assured him was available in great quantities in Persia. Bontius frequently refers to how the "Indians" or, more particularly, the "Javans" or "Malays" did things. When reporting on "tutty," for example, he notes that women in the Indies use it to remove unwanted hair. In the case of *agallochum* (Aloes-wood; probably *Aquilaria* Thymelaeaceae), "called by the Indians *Calambac*," he informs his readers that "a powdered scruple of it" cures the cholera locally called "mordexi" and heals disorders caused by cold-

ness in the stomach and intestines, "in children efficaciously countering tineae, and ascarides"; he could not resist noting that the Chinese and "Moors" used it as an incense sacrifice.[39]

Bontius suggests that he made every effort to acquire information by means of friendship, persuasion, and payment, but he was sometimes met with fear, or at least caution. In acquiring goods, and in its efforts to establish a monopoly over the trade in fine spices, the VOC sometimes resorted to extreme violence. The worst atrocities were perpetrated on the Banda Islands, where the world's supply of nutmeg grew, just a few years before Bontius arrived in Batavia. After years of attempts on the part of the islanders, by violence and by "smuggling," to resist the VOC's contractual monopoly on their produce, Governor-General Coen exterminated most of the islanders, replacing them and their villages with Dutch-run plantations worked by slaves (see Julie Berger Hochstrasser's essay in this volume). It is perhaps not surprising, then, that one of the few stories Bontius tells about his relationships with local people is permeated with fear. An elderly Javanese neighbor, a female slave of a Chinese gardener, possessed a "woodpecker" that could speak even more like a human than a parrot could (it was undoubtedly a mynah). Bontius tried several times, to no avail, to purchase the bird from her in order to observe and draw it. He then tried to convince her to lend it to him. After many such attempts she finally agreed, stipulating that he not feed it any pork. When Bontius and the artist got it home, the bird began saying "Orang Nasarani Catjor Macan Babi," or "Dog of a Christian, eater of pork." He implies that he neither fed it pork nor injured it.[40]

Bontius relates much information about how local women used plants in the kitchen or in medicine; this too he must have acquired from female sources. For example, the "hog stone" or Malacca stone (a soft and fat stone "that feels like Spanish soap"), which came from the gall of hogs and the stomachs of porcupines, was infused with wine to treat mordexi, but it was also dangerous to pregnant women and caused abortions; "I have been told by Malayan women that it is certain to provoke an abortion, and if their menstrual purgations do not come at the right time, if they only hold this stone in their hand they are rejuvenated." About Indian saffron, or turmeric [*Curcuma Zingibereceae*], locally called "borbory," Bontius wrote that "throughout the Indies no plant was more frequently used." It was taken internally and applied topically for obstructions of the bowels and mesentery and for urinary complaints. Moreover, "in diseases of women nothing is so much celebrated by the Malayan women than this borbory. It has a divine effect in easing childbirth, in cases of difficult urination, and in kidney problems. For problems of the uterus it is a specific." (That is, it had powers against these complaints in particular.) "And to make sure of this truth, among all

medicines I have myself found nothing better in these afflictions than this remedy."[41]

This last remark suggests that Bontius practiced medicine on women. Although it is likely that his patients were exclusively European, Bontius may have learned from them about indigenous remedies. European women would have mixed more easily with Asian women in the early days of the Dutch colonies than in the later years, when they often behaved in a high-and-mighty way. It is also possible that Bontius obtained local information through his own (European) wives. In addition, a growing population of people of mixed heritage and multilingual abilities, many of whom became crucial information brokers, was beginning to take shape in Batavia and other VOC settlements.[42] Moreover, masters could obtain information from household servants and slaves. Bontius owned slaves, as is clear from his reference to "my Moorish slaves" as well as the human "chattel" mentioned in his will.[43] Perhaps slaves were the main informants on the uses of herbs in the kitchen to which he frequently referred; they certainly told him about tigers.[44] Bontius may also have obtained information about local plants and their uses from women selling vegetables in the Batavian markets: still today women tend to be the main retailers of local produce, not only bringing things to market that university-educated ethnobotanists and others have not seen before, but also providing information about the uses of them.

Bontius's praise for local women extended to the people of the region more generally: "And here, by the way, I note that these nations, though many among us call them barbarian, are superior to the Poles and Germans in pickling fish, who nevertheless are awarded these plaudits without blushing."[45] Elsewhere he notes that the people who came from Surat and the Coromandel Coast must be followers of Pythagoras since they were vegetarians who even abstained from red beans and herbs because of the color. "Thus it is that those who in other things are illiterate have an exact knowledge of herbs and shrubs, such that if the most learned [Pieter] Pauw,[46] prince among the botanists of our age, came back from the dead and traveled here, he would be surprised that these barbarian peoples could instruct him." Bontius even noted, with reference to Clusius's annotations of da Orta, that "they write so elegantly as to excel us by a long way; and when they draw the characters they delineate on these [palm] leaves (which are Arabic) then my indignation rises against those of our Europeans, and especially our compatriots, who admire nothing unless it is their own, even calling these peoples barbarian who, of a more laconic mind, can express more of their meaning in only a few significant characters than ours can with long phrases and useless multiplicity of words." He even praised the Mataramese, who had besieged him: "Although it appears that the kingdom of Java is des-

potic (*Tyrannicum imperium*), they exercise their authority in light of the condition of the people so that everyone, unless blinded or completely thick, will quickly realize that their political system benefits them, the government ruling well and the people obeying even better." "I often marvel at the carelessness of our people, who without respect call these people barbarians," he reiterated, who "not only in their knowledge of herbs but in all aspects of their economic system (*oeconomica administratione*) leave our own far behind."[47]

Bontius's positive estimation of local knowledge may have a great deal to do with the fact that the relationships he entered into often required a modicum of mutual respect. He met many people who gave him objects and information, whose gifts in turn solicited personal obligation on his part. The exchanges between Bontius and his informants might therefore be said to fall into the category of "gift exchanges." The French sociologist and anthropologist Marcel Mauss offered a well-known model for thinking about the function of gifts in "archaic" societies as an index of their difference from commercial societies of twentieth-century Europe and America.[48] Gift exchange requires reciprocity: the given embodies the character of the giver, and the giving and receiving take place in a face-to-face exchange through which the parties are linked to one another personally. In commercial exchange, transactions are voluntary and involve impersonal and alienable objects; and seller and purchaser are (or can be) completely unknown to one another. Mauss's model does not correspond exactly to the complicated worlds in which people actually live: even highly commercialized exchange economies involve gift relations, just as societies based on giving also transact commercial exchanges.[49] Societies along the island coasts of the Dutch East Indies had been commercialized for some time before the Europeans arrived, even though they were not as highly commercialized as Dutch society. But the simple message of Mauss is that gifts are special and personal, obliging their recipients to the giver and weaving together the lives of the participants in the exchanges. "It goes without saying," comments one of Mauss's interpreters, that the gifts "are not necessarily 'things' in the sense of material objects having a cultural significance. The 'thing' may also be a dance, a spell, a human being, support in a dispute or a war, and so forth"[50]—or even information. Bontius was awarded a position by the Gentlemen Seventeen of the VOC that he repaid by recording his observations on the medicine and natural history of their eastern lands; in the course of his efforts he also received gifts of knowledge from many other people, which he repaid in part by defending their reputations.

The economy of Bontius's information gathering went two ways: on the one hand, the personal relations he cultivated in the East Indies en-

tailed obligations; on the other hand, he transformed what had been gifted to him into a form he could transmit to European sponsors, readers, and markets. Indeed, Bontius "took" something of what he learned from his informants by transforming it into public knowledge. He converted their utterances into information packaged in Dutch or Latin words and syntax, and aimed to transmit them via publication. Bontius transformed indigenous knowledge into those "matters of fact" so highly regarded by his European peers. One aspect of "matters of fact" that sometimes goes unnoticed is that they appear to be true without regard to time or place, just as commodities appear to be the same regardless of where they are consumed. (That is, just as a packet of cigarettes is not altered by its context despite the diversity of meanings its possessors might invest in it, so any simple and clear descriptive "matter of fact" is universally the same in any culture no matter what variety of implications it might acquire.)[51] While he appreciated local knowledge, Bontius dismissed out-of-hand the values Malays and others attributed to plants, and very seldom included any such information in his written accounts. In one case, in his comments on Indian verbena (*Cymbopogon citrates*), he revealed his assumptions by qualifying the inclusion of indigenous knowledge as follows: "this herb," he wrote, "is considered sacred among the old Indian women (which they have in common with our own old women)," but he mentioned this only to "demonstrate the foolish habit" of mind that considers such things to be true, for "I am not one of those who has a propensity to superstitious belief about the powers of medicines, which are [rather] from nature."[52] In other words, he privileged certain kinds of knowledge and favored those that had to do with things and the material uses of those things.

Translated to a European context, such descriptive statements acquired a common value and were easily exchanged, just as commodities were exchanged on the Amsterdam stock market. There merchants traded one thing for another by agreeing on a common value. It had come to be recognized that the ability to transform the value of one thing into another was not neutral but had a value of its own, prompting important philosophical investigations.[53] It has even been argued that early modern European mathematics developed a concept of "general magnitude," which emerged from attempts to calculate apparently incommensurable things in the marketplace.[54] The merchants of the VOC for whom Bontius worked were keenly interested in making the diverse things in which they dealt commensurate, and they needed detailed information in order to do so. In works such as Bontius's, then, foreign nouns, adjectives, and verbs that were tangible—simple morphologies that address the five senses rather than the mind's eye—were valued because they were readily transferable, while he ignored, misunderstood,

or dismissed as superstition local interpretations of them. He (re)produced knowledge of objects, accumulated it, and exchanged it, just as the merchants who governed the VOC did with commodities. The author appropriated information as his own not just by learning about material things and practices but by transforming them into commensurable facts.

Long before the rise of nineteenth-century racism and orientalism,[59] then, much of the work of natural historians from Europe, including Bontius, reinscribed information developed by other people in other cultures, past and contemporary, making it objective and exchangeable. Whatever we call the method by which Bontius rendered reading, conversation, and observation into "his own" work, he owed enormous debts to others and recognized his obligations. One can detect beneath his words literate traditions that reach back to Greek antiquity and Islamic culture, as well as oral traditions reaching from Persia and Armenia, through South Asia to Java and on to the Spice Islands, China, and Japan. In reinscribing this knowledge Bontius universalized and objectified it, making it a kind of commodity. Nevertheless, he knew even better than we what debts this placed him under, eliciting his respect for those from whom he received knowledge, whether European or Asian. His acknowledgments should remind us that our own objective science is built from countless human interactions occurring around the globe.