

Specimen Lists

Artisanal Writing or Natural Historical Paperwork?

*By Valentina Pugliano**

ABSTRACT

The epistolary exchanges of early modern natural history have long been of interest to historians of science, as they reflect the dynamic nature of the emergent discipline better than the printed volumes of natural history. Less attention, at least until recently, has been paid to the unfinished pieces, the cryptic marginalia, and the practical notes that more often than not accompanied letters. Lists of specimens sent or requested were among the new tools at the naturalist's disposal for dealing with a scientific world increasingly populated by objects. This essay seeks to reconstruct the genealogy of specimen lists by focusing on little-known apothecaries in northern Italy: the individuals traditionally held to be social counterparts to these modest strings of words. It seems that the operations at the back of the shop and the literature generated by the centuries-old drug and spice trades may have been a more defining influence on early modern naturalists than the humanist practices of indexing and commonplacing that were concurrently embraced by Italian *studiosi*.

IN 1464 ANGELO DECEMBRIO, a minor noble at the Este court in Ferrara and a precursor of Italian commentators on *sprezzatura*—the Renaissance art of genteel deportment and effortless sophistication—completed *De politia litteraria*. Along with general advice to noblemen on how to assemble an ideal library, the manuscript also gave instructions on how to keep it. To ward off insect pests, the boards holding the manuscripts should be coated in a paste made with juices of wormwood, rue, and bay laurel berries; dried leaves of the same left in bowls in strategic corners of the room would drive away spiders and moths. Thus, Decembrio hoped, the custom of locking tomes out of sight in chests or behind glass might be abandoned.¹

Plants and books led an intricate and interrelated life in Renaissance Europe, starting at this level of raw materials. A new interest in both had surged through the pens of

* Max Planck Institute for the History of Science, 14195 Berlin, Germany; vpugliano@mpiwg-berlin.mpg.de.

¹ Jon P. Perry, "Practical and Ceremonial Uses of Plant Materials as 'Literary Refinements' in the Libraries of Leonello d'Este and His Courtly Literary Circle," *La Bibliofilia*, 1989, 91:122–173, esp. p. 131.

fifteenth-century humanists. So it is perhaps fitting that historians of science and book historians alike should now revisit the connection between the study of nature and the management of proliferating information on the subject made available by expanding geographical horizons and the print explosion of the sixteenth century.² Attention has so far focused on the birth of reference tools and writing systems that complemented the scholar's changing reading habits, such as note taking, commonplacing, and indexing. An example of this industriousness, recently discussed by Ann Blair, is the method of indexing *topoi* and books that the bibliophile and naturalist Conrad Gesner devised in the 1540s. The method required clever use of temporary glue to keep one-line slips of information in order before the scholar could rearrange them alphabetically. The informal yet orderly paperwork resulting from such new methods of digesting the written word is usually viewed as the initial fabric into which further scholarly work was laboriously woven. In more "modern" times, its place would be taken by the scientist's pocket book and other paper technologies that allowed for the gradual elaboration of concepts and theories.³

But what about those ephemeral unfinished pieces and practical scribbles, with a short life and rough immediacy, that accompanied the naturalist's correspondence? Take, for example, the slip of paper (now lost) that Carolus Clusius received in 1589 from the London apothecary James Garet. As Garet describes in the accompanying letter, this slip showed the "Indian" name for star anise, "Damor," in the handwriting of a boy from Manila, one of the five boys "acquired" by Thomas Cavendish along with Spanish bullion during his first circumnavigation and brought to Garet's shop, a well-known London hub for news and exotica. As the apothecary told his correspondent: "they write from the top going down as you will see."⁴ In the hands of some, this bit of folk botany could have made it into a Gesnerian indexing system, yet as far as we know neither sender nor receiver ever made much use of it.

In this essay I will focus on a type of document that, though more structured than Garet's one-item slip, was still conceived from the beginning as a blunt tool to deal with nature's materiality as opposed to its textuality: the specimen list. Simply put, the specimen list was a basic enumeration of natural objects (see Figure 1). It described items meant to be acquired or sent—or those simply desired—and it was a sixteenth-century staple for anyone wishing to make the study and collecting of *naturalia* his or her business. Mentions of specimen lists litter the correspondence of Italian naturalists, whether they had a Latinate upbringing or were involved in the victualing and pharmacy trades. It is the latter group, though, that offers interesting insights into the genealogy of the specimen list. I will argue that, far from being the preserve of scholars and courtiers, specimen lists likely first hailed from the stalls of smelly

² See Brian W. Ogilvie, "The Many Books of Nature: Renaissance Naturalists and Information Overload," *Journal of the History of Ideas*, 2003, 64:29–40; Ann Blair, "Reading Strategies for Coping with Information Overload, ca. 1550–1700," *ibid.*, pp. 11–28; and Blair, "Note Taking as an Art of Transmission," *Critical Inquiry*, 2004, 31:85–107.

³ Ann Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age* (New Haven, Conn.: Yale Univ. Press, 2010), p. 96 (on Gesner); Christoph Hoffmann, "The Pocket-Schedule: Note-Taking as a Research Technique," in *Reworking the Bench: Research Notebooks in the History of Science*, ed. Frederic L. Holmes, Jürgen Renn, and Hans-Jörg Rheinberger (Dordrecht: Kluwer, 2003), pp. 183–202; Lorraine Daston, "Taking Note(s)," *Isis*, 2004, 95:443–448; and Staffan Müller-Wille and Isabelle Charmantier, "Natural History and Information Overload: The Case of Linnaeus," *Studies in History and Philosophy of Biological and Biomedical Sciences*, 2012, 43:4–15.

⁴ James Garet to Carolus Clusius, 28 July 1589, Leiden University Library, Digital Collections, MS 101.

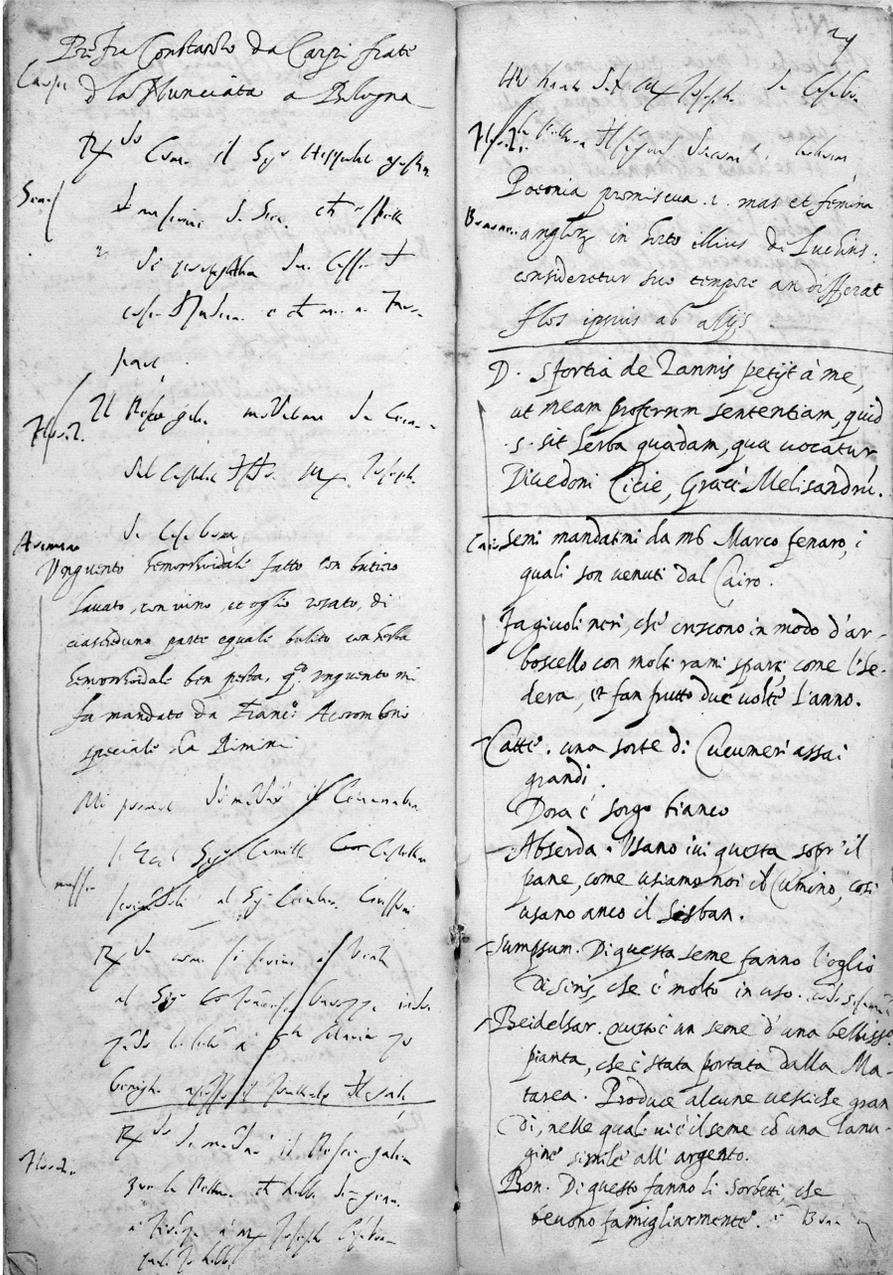


Figure 1. Bottom right: Transcription of the list of seeds from Egypt that the Venetian apothecary Marco Fenari sent to Ulisse Aldrovandi, probably in the 1570s. "Semi mandatimi da messer Marco Fenaro i quali son venuti dal Cairo," Biblioteca Universitaria Bologna, Fondo Aldrovandi, MS 136/xi, fol. 29r. Courtesy of the Biblioteca Universitaria di Bologna.

fisheries and the ledgers of spice warehouses—in other words, from a mercantile and artisanal context that preceded any humanist writing and where they had long been used to manage the flow of objects. Apothecaries, who dealt with writing supplies and

nature's simples (*simplicia* or medicinal ingredients) by trade, and many of whom became interested in *res herbaria* as well, offer an ideal window on the potential exchanges between commerce and intellectual pursuits. My source is a particularly prolific group of *speziali* from the Veneto and Tuscany, whose friendship with the Bolognese professor of natural philosophy Ulisse Aldrovandi (1522–1605) ensured the survival of a healthy portion of their “scientific” papers. After their letters, specimen lists were the most common type of “botanical” document left behind by these men.

The importance of this paperwork for naturalists is firmly tied to the history of their emerging “discipline,” owing not only to the reintroduction of dozens of simples rediscovered in the texts of the ancients, but also to a major shift in the way in which nature itself began to be studied after the first generations of the so-called humanist botanists. “Learning about herbs by experience,” once a source of prejudice against plant gatherers, gained increasing appeal over simply reading about them in books.⁵ In turn, natural historical practice came to depend on a steady circulation of specimens (and the gradual aggregation of specialist archives of *naturalia*) and on networks of intermediaries (from peers to paid labor) who took care to procure and move said specimens around. Lists offered tradesmen and scholars alike the quickest way to record and regularize these exchanges. Less an epistemological act than a portable storage tool, these handwritten ephemera were therefore an answer not to “information overload” but to a sudden overabundance of objects. They facilitated the movement across the continents of brittle exotica in cluttered boxes. They helped organize items in the naturalist's cupboard and came to the aid of his overcrowded memory. They silently wove together social and intellectual networks with the promise of new objects to be delivered and nuggets of information to be shared, reinforcing the ties that bound the community of naturalists.⁶

Whether as wish lists, checklists of items sent, or catalogues of collectable and collected items, specimen lists differed little in format and invariably spelled out their contents in no discernible order, using either or both simplified pharmacy Latin and the vernacular. The list could be horizontal, short, and appear in the body of the letter: “*locitide aspera, pithiusa, juniper major, laudanus, nepa, nonis*, and others,” as the Florentine apothecary Stefano Rosselli ticked off, alerting Aldrovandi as to the simples he was sending to Pandolfo Rucellai. More often, it ran to some two dozen items and was written on a separate sheet either to be packed along with the specimens or for the recipient to carry around until all the desired items were gathered. A convenient memory aid, it became part of the naturalist's equipment in the field and had a lifespan of a few months: “as for the other plants you desire, I have the list [*memoriale*] and won't forget,” Gianbattista Fulcheri wrote reassuringly to Aldrovandi from Lucca. Two years earlier, Fulcheri had sent Aldrovandi a catalogue (*catallogho*) of his “small garden” and asked him to select what caught his fancy.⁷

⁵ Karen M. Reeds, *Botany in Medieval and Renaissance Universities* (New York: Garland, 1991), p. 24. See also Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley: Univ. California Press, 1994).

⁶ See Valentina Pugliano, “The Mundane Art of List-Making” (forthcoming). For a more metaphorical reading of the social value of listing see James Delbourgo, “Listing People,” in this Focus section.

⁷ Stefano Rosselli to Ulisse Aldrovandi, 8 Mar. 1560, Biblioteca Universitaria Bologna, Fondo Aldrovandi (hereafter cited as **Fondo Aldrovandi**), MS 38/iii, fol. 74r; and Gianbattista Fulcheri to Aldrovandi, *ibid.*, 28 Nov. 1571, fol. 124r, 27 Apr. 1569, fol. 113r.

This sort of enumeration prefigures the sale catalogues of seventeenth-century plant sellers but also highlights the specimen list's function as both a shared tool and a document of social interaction. Rather than being mere traces of private thoughts, these "texts" were usually written for others, to bind them in friendship and favor. Collection inventories also had the greatest potential for further revision, editing, and an afterlife in print. The Veronese apothecary Giovanni Pona was working in just this way in 1601, when he enlarged a manuscript inventory of two hundred items he had compiled in 1596 to record his cabinet of curiosities and turned it into a printed, alphabetical catalogue of a thousand items (see Figure 2).⁸

The apothecaries' limited involvement in the world of print had little impact on the day-to-day operations of natural history, which were still steeped in scribal culture and conducted by way of handwritten letters, flyleaves, and labels. The rather adventurous James Garey went so far as to adopt paper itself as a signifier, creating a functional language of sorting after writing had failed him. In 1589 he sent Clusius twenty-five white, three striped, and five blue hyacinth bulbs, the latter wrapped "in a piece of blue paper." "I would have sent you more," he added, "but the signs I had made on them when in bloom have disappeared," making it impossible to distinguish them from the others.⁹ A checklist would have been of little use, given the bulbs' identical outward appearance. "Blue paper" had long been used by artists in northern Italy for their preparatory sketches (only later would it become the cheap wrapping for sugar from which the *bibliothèque bleue* got its name). Yet Garey's idea seems to have been to employ different-colored papers according to the hues of the flowers they were going to guard: a material rubrication of the rarer garden stock that served better than unreliable ink.

Indeed, certain striped tulips probably became known as "*ghemarmerde*" or "*marbrée*" in reference to the marbled paper in which they reached Europe from Ottoman Turkey, where it was used to showcase calligraphic work. Besides being among the few places where one could write and send mail, pharmacies sold common paper and brown ink, alongside artists' preparatory cartons, dyed papers, and the raw materials to produce pigments and dyes. Despite Garey's dissatisfaction with the medium, "secrets" for ink, too, usually produced from botanical or animal material available in the shop, began to appear in the pharmacopoeias of the period. The most popular manual in the Republic of Venice, the *Avvertimenti* of Giorgio Melichio of the Ostrich pharmacy, offered two recipes: a "marvelous" one for "fine ink" that required oak galls, vitriol, gum arabic, and white wine and took eight days to concoct; and a recipe for a coarser variety obtained from the water shoemakers used to cure sole leather, in which acorns had been soaked beforehand.¹⁰

In Aldrovandi's working notebooks specimen lists are ubiquitous, penned by correspondents and by the naturalist himself, who was especially fond of listing items that would enlarge his already dazzling "Theater of Nature," as in the "Catalogue of birds I desire that are caught in the Trentino" (see Figure 3 and Frontispiece). Besides offering

⁸ "Lista dele cose che si trovano nel repositoio di Giovanni Pona spetiale in Vinetia [Verona] di luglio 1596," Biblioteca Ambrosiana Milano, MS D172inf./21, fols. 76r–79v; and Giovanni Pona, *Index multarum rerum quae repositoio suo adservantur* (Verona: Angelo Tamo, 1601).

⁹ Garey to Clusius, 28 July 1589 (cit. n. 4). On the scribal culture of natural history see Elizabeth Yale, "Manuscript Technologies: Correspondence, Collaboration, and the Construction of Natural Knowledge in Early Modern Britain" (Ph.D. diss., Harvard Univ., 2008).

¹⁰ Anne Goldgar, "Nature as Art: The Case of the Tulip," in *Merchants and Marvels: Commerce, Science, and Art in Early Modern Europe*, ed. Pamela Smith and Paula Findlen (New York: Routledge, 2002), pp. 324–346, esp. p. 332; and Giorgio Melichio, *Avvertimenti nelle compositioni de' medicamenti per uso della spetiaria* (Venice: Giacomo Vincenti, 1605), p. 194v.

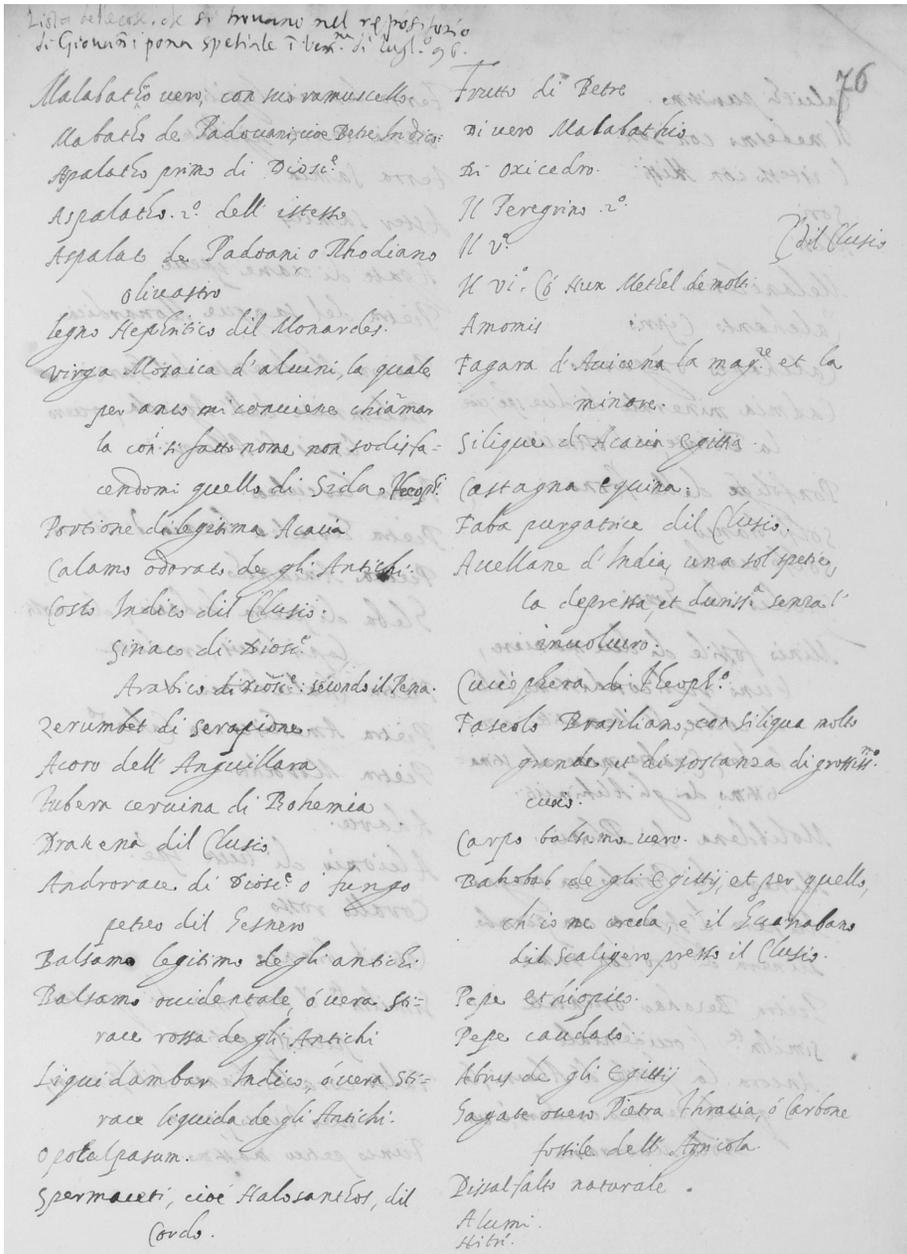


Figure 2. "Lista delle cose che si trovano nel repository di Giovanni Pona spetiale in Vinetia [Verona] di luglio 1596," Biblioteca Ambrosiana Milano, MS D172inf./21, fol. 76r. Courtesy of the Veneranda Biblioteca Ambrosiana and De Agostini Editore.

this metaphorical appropriation of specimens, the handy tool had so infected Aldrovandi's way of organizing his work that it transferred smoothly to other spheres of his life. It of course supported his reading practices, with a "List of the books awaited in the [printing] shop of Valgrisi," and even helped keep track of his domestic life, with a curious "List of



Figure 3. Pasted watercolors of miscellaneous specimens in the Aldrovandi collection. Biblioteca Universitaria Bologna, Fondo Aldrovandi, Tav. Vol. 4, Unico/65. Courtesy of the Biblioteca Universitaria di Bologna.

the dishes prepared for the meals in the year 1571.” Perhaps taken by the general listing frenzy as well as by his own need to keep everything recorded, Aldrovandi even devoted three pages to listing all his known relatives.¹¹ Indeed, the only reason why we are now aware of the botanical lists of the *speziali* is thanks to the hoarding tendencies of the Bolognese polymath, who regularly had them transcribed into a bound volume. In contrast to the scholarly notes studied by Ann Blair, these specimen lists were in fact intended only as temporary archives.¹²

In all likelihood, apothecaries retained the longer *petenda* (“to be acquired”) and *missa* (“sent”), as these lists were occasionally called, to keep track of their literal and metaphorical dues within the naturalists’ community, but shorter pieces and checklists were usually discarded after use. Moreover, because they dealt with objects, these documents were concerned with ownership rather than authorship, which might otherwise have given them a measure of stability. When Fulcheri lost a bunch of letters, including a wish list of Aldrovandi’s, while riding to Pisa, he simply asked the latter to “incommode” himself by having his scribe prepare another copy. Aldrovandi, who is known to have prepared his *Lexicon of Inanimate Things* by dividing Gesnerian slips of paper in canvas bags corresponding to the letters of the alphabet, and to have written up a method to place books in a library according to the division of the disciplines, was nothing if not a painstaking collector.¹³ His attempts to fix the transitoriness of specimen lists reflected his compulsion to order and accumulate more than their intended use in the eyes of his correspondents.

But where did this practical tool originate? How is it that specimen lists appeared in the mid-sixteenth century as an already distinctive form of natural historical paperwork? When the apothecary Francesco Calzolari published the *Iter Baldi Montis* (1566), his famous booklet on the Veronese flora, he apologized for its brevity. The botanical richness of Mount Baldo, he wrote, would lend itself to a far longer treatment, but “I am not ashamed to say that there would be need of an intellect versed in languages, and more exercised in composition than mine; from childhood I have been busy with the care of my family and practical work rather than contemplation.”¹⁴ As far as the lists of the *speziali* go, we should take Calzolari’s candor at face value. Models are more likely to have come from a written environment familiar to apothecaries, who were educated through hands-on apprenticeship, a few choice readings, and mercantile practices of record keeping. It also seems reasonable to speculate that when confronted with the demands of objects rather than texts, *semplicisti* (as Italian naturalists called themselves) in general would look first to existing forms of writing dealing with commodities. After all, as has been noted, the popularity of the “new” excerpting techniques in the Renaissance owed as much to the efforts of humanist pedagogues as to their adaptation of note-taking practices already established by medieval scholarship.¹⁵

A hint as to the genealogy of specimen lists is given by the terms these artisans used to describe them (which their nonartisan correspondents also adopted). While the word “*lista*”

¹¹ Fondo Aldrovandi, MS 136/iii, fols. 2v–32r (“Catalogue of birds”), MS 136/v, fol. 375r (“List of the books”), MS 136/vi, fols. 153v–155r (“List of the dishes”), MS 136/ix, fols. 238r–240r (list of known relatives). Another eclectic user of lists, two centuries later, is Linnaeus; see Staffan Müller-Wille and Isabelle Charmantier, “Lists as Research Technologies,” in this Focus section.

¹² Blair, *Too Much to Know* (cit. n. 3), p. 63.

¹³ Fulcheri to Aldrovandi, 23 Feb. 1569, Fondo Aldrovandi, MS 38/iii, fol. 110r (lost wish list); Blair, *Too Much to Know*, p. 105 (canvas bags); and Fondo Aldrovandi, MS 97, fols. 440r–443r (library organization).

¹⁴ Francesco Calzolari, *Viaggio a Monte Baldo della magnifica città di Verona* (Venice: Valgrisi, 1566), p. 5.

¹⁵ Blair, *Too Much to Know* (cit. n. 3), p. 73.

appears sporadically, “*poliza*” and “*catalogo*” are more common and usually interchangeable. “*Poliza*,” especially, was a technical term for bills of goods and waybills. In the realm of pharmacy, it referred to orders of remedies and retail stock. Its use within the efficient Venetian bureaucracy can be seen, for example, during the plague outbreak that struck the city in 1576. The Venetian Health Board appointed Francesco Corniani of the *Medico* to supply “ointments, plasters, and other medicaments” to the two pesthouses of the city. The *lazzaretto*’s personnel would send a *poliza* to the apothecary’s shop. Corniani then filled the order, returning an annotated and signed copy of the list to the *lazzaretto* along with the items. A separate copy would go to the office of the Health Board, this one with an itemized list of costs and a request for payment that was checked for fraud before being honored.¹⁶

Unlike many trades and crafts that worked through nontextualized knowledge, pharmacy made regular use of manuscript and printed manuals and generated substantial amounts of paperwork during its daily operations. Many of these documents were based on lists of one kind or other. Anke te Heesen has stressed the influence of accounting, particularly the thirteenth-century Italian innovation of double-entry bookkeeping, on methods of “fact keeping” in early modern science. Pharmacies recorded transactions in similar ledgers, which were kept not only to track past business but also because the accounts within, opened on credit, often went unsettled for months and even years.¹⁷ Obvious antecedents of list making were the enumerations of stock and valuables in shop and household inventories, one of the many notarial acts employed by those in the medical trades. Physicians left books, surgeons and barbers left chests of instruments, and apothecaries left drugs and fittings. The following comes from the fifteen-page stock inventory commissioned in 1592 by Fabricio Foresto of the Two Towers and the Sun pharmacy:

Levant nuts	on [ounce]. 6
Mummy	li [libra]. 2 on. 4
Mandrake root skins	on. 8
Galanga	on. 6
Spikenard	on. 2
Madder	on. 4
Dry plums	on. 6
Sweet wood	li. 1
Anise flour	li. 1

In 1585, with a more wordy formula, the few possessions of the insolvent Giacomo passed on to Andrea, a bookseller with a shop in the Rialto, Venice’s commercial heart:

A book in folio covered in leather with some loose sheets
 Another small book, long, covered in leather
 A small wooden box with three silver rings, some pieces of coral, and two teeth
 A box with eight pounds of lapis lazuli, and one pound of silver.¹⁸

¹⁶ Archivio di Stato di Venezia, *Provveditori Sanità*, b. 733, fols. 51r–53r.

¹⁷ Anke te Heesen, “Accounting for the Natural World: Double-Entry Bookkeeping in the Field,” in *Colonial Botany: Science, Commerce, and Politics in the Early Modern World*, ed. Londa Schiebinger and Claudia Swan (Philadelphia: Univ. Pennsylvania Press, 2005), pp. 237–251, esp. p. 242 ff.; and James Shaw and Evelyn Welch, *Making and Marketing Medicine in Renaissance Florence* (Amsterdam: Rodopi, 2011), pp. 123–158 (pharmacy ledgers). On trades and crafts whose knowledge was nontextualized see Pamela H. Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: Univ. Chicago Press, 2004).

¹⁸ Archivio di Stato di Venezia, *Giudici di Petizion*, Inventari, b. 340/5, n. 61, “Denuncia dei beni di Fabricio

Thirty years earlier, the Flemish physician Reiner Solenander had sent Aldrovandi a shopping list for *materia medica* from Naples, wishing him “to choose what in your opinion is of the best quality, pay for it via the present [letter] carrier and send it to me”:

True rhaponticum newly arrived d. 1
 Myrrh d. 1,5
 Styrax d. 1
 Juice of rhus obsonorium, or that not being available, the rhus obsonorium itself d. 1
 Nardum Indicum called by the populace spikenard, fresh and good d. 1.5
 Cardamom in its pods d. 1
 [Gum] Galbanum d. 5
 Gum Sagapen d. 5
 Opoponax d. 5
 Castoreum d. 5
 Asphaltum or, if they sell it, what they call bitumen judaicum d. 1
 Galanga major d. 1
 The flowers called sweet-smelling hyacinths, squinanthus, but fresh and good d. 1
 Orgaricum d. 2
 Lignum aloe d. 2.¹⁹

The quantities are given in apothecary’s drams (ʒ = ca. 3.4g), and the list is a standard bill of retail stock. Aldrovandi likely fulfilled the request by sending a servant directly to a Bolognese pharmacy, where dried flower heads and clean resin balls would have been ready for sale. Such requests became common over the course of the century, as physicians and apothecaries alike, with and without a direct interest in *res herbaria*, began to take advantage of the new widespread expertise in botany and of their contacts among *simplicisti* to procure high-quality and rare medicinal ingredients.

Other types of pharmacy documents were less succinct but still consisted of consecutive lines of ingredients and weights, like the prescriptions physicians wrote to treat the ailments of individual patients. The apothecary prepared the prescribed remedy accordingly, knitting together the string of basic information supplied in a narrative of processes (from crushing and mixing to boiling) that he knew by heart or could consult in a manual. These prescriptions were usually filed away in the shop’s master book for later use. Here there was a reconnection, at least superficially, with humanist referencing techniques. Collections of recipes and secrets, popular in both households and shops of Renaissance Europe, are said to resemble commonplace volumes. Just as memorable and edifying passages were extracted from their context by students and scholars for further perusal, short paragraphs headed by the remedy’s name and explaining its preparation might be copied into a notebook. The *zibaldone* (or personal observations book) of recipes to cure gout, polish boots, and temper metals on which the apothecary Stefano Rosselli and his sons labored for over twenty years fits precisely into this category.²⁰

Given that compilations of practical recipes significantly predate commonplaceing, it is

Foresto, speciale alle Due Torri e il Sole: 14 marzo 1592”; and *ibid.*, b. 339/4, n. 11, “Inventario per il defunto Giacomo speciale: Die 12 aprilis 1585.”

¹⁹ Reiner Solenander to Aldrovandi, 5 July 1556, in Alessandro Tosi, ed., *Ulisse Aldrovandi e la Toscana: Carteggio e testimonianze documentarie* (Florence: Olschki, 1989), p. 78.

²⁰ For an index of Rosselli’s *zibaldone* see Suzanne B. Butters, *The Triumph of Vulcan: Sculptors’ Tools, Porphyry, and the Prince in Ducal Florence* (Florence: Olschki, 1996), Vol. 2, pp. 454–459. On the practice of copying remedies’ names and preparations in notebooks see Margaret Pelling, *Medical Conflicts in Early Modern London: Patronage, Physicians, and Irregular Practitioners, 1550–1640* (Oxford: Clarendon, 2003), pp. 109–110.

perhaps the scholars' *loci* that should be likened to the recipe collections, rather than vice versa. Their increasingly converging format undoubtedly reinforced the appeal of the scholarly technique.²¹ Similarly, Mary Fissell has stressed the relation of printed herbals and pharmacopoeias, organized around the one-recipe entry or ingredient, to another element of the sixteenth-century textual world: the fragmentary way in which they were consumed, which promoted reading habits that privileged self-contained passages rather than cover-to-cover reading.²² Arguably, apodictic texts like one-line slips and specimen lists (often consulted not in their entirety but for single entries) can be regarded as an extreme case of fostering a focused yet disjointed form of attention.

Needless to say, on the Italian peninsula, where the majority of nature's connoisseurs belonged to the medical arts, naturalists must have been familiar with this range of trade paperwork, routinely compiled—as we have seen—not just by apothecaries but by physicians as well. Back in the 1940s, Edgar Zilsel was one of the first to envisage a significant role for artisans in the development of science, and the idea has been regaining momentum in recent historiography.²³ Renaissance pharmacy contributed some of the essential material practices that sustained the running of natural history, from the methodical training of the senses for fieldwork and workshop experiments to techniques to preserve specimens and collectables and transport them safely. Specimen lists are another instance of artisanal contributions to “science.” They certainly seem to have been adopted by naturalists for their own purposes with very little deviation from their commercial originals, not only in format and style but also in intent: recording and moving objects around. Discussing writing and authorship, Pamela Long has described the appropriation of humanist texts and tropes by fifteenth-century “artisan practitioners” seeking to fashion rational histories of their skills and crafts that would result in the promotion of status for several mechanical arts.²⁴ Although they are the result of a similar exchange between the workshop and the philosopher's study, specimen lists document a rather different process. For once, the artisan's hand can be discerned not only in the realm of instruments and techniques but also where words, stylus, and paper were concerned. If the specimen list was primarily a tool to manage the material underbelly of the emergent *res herbaria*, rather than its theoretical premises, we should also remember that many of these apothecaries were not mere laborers but were acknowledged by contemporaries as scholars of nature in their own right.

²¹ See, e.g., Mark Clarke, *The Art of All Colours: Mediaeval Recipe Books for Painters and Illuminators* (London: Archetype, 2001).

²² Mary Fissell, “Readers, Texts, and Contexts: Vernacular Medical Works in Early Modern England,” in *The Popularization of Medicine, 1650–1850*, ed. Roy Porter (London: Routledge, 1992), pp. 72–96, esp. p. 78.

²³ See, among several articles, Edgar Zilsel, “The Genesis and Concept of Scientific Progress,” *J. Hist. Ideas*, 1945, 6:325–349; and Walter E. Houghton, “The History of Trades: Its Relation to Seventeenth-Century Thought as Seen in Bacon, Petty, Evelyn, and Boyle,” *ibid.*, 1941, 2:33–60. The latest in a series of new studies is Ursula Klein and Emma C. Spary, *Materials and Expertise in Early Modern Europe: Between Market and Laboratory* (Chicago: Univ. Chicago Press, 2010).

²⁴ Pamela O. Long, “Power, Patronage, and the Authorship of *Arts*: From Mechanical Know-How to Mechanical Knowledge in the Last Scribal Age,” *Isis*, 1997, 88:1–41, esp. p. 30.