

Introduction

Early Modern Print Culture

This book explores the visual imaginary of Russia in Europe in the era of humanism (ca. 1500 to ca. 1650). It details how Europeans learned about Russia through the visual, how that knowledge was disseminated and how it contributed to Europeans' understanding of themselves.¹ It joins a broad literature in history, art history and the history of science on the use of the visual in knowledge production in the early modern world. Historians of science have explored how naturalists devised standards for depiction of plants, animals and anatomy, and in the process created scientific communities across Europe.² Other historians have explored how Europeans depicted outsiders, from New World natives to neighboring Europeans, to make sense of their expanding world.³ Here I explore how the visual was used to create knowledge about the familiar and unfamiliar people and cultures on Europe's borderlands; our case study is Muscovy and its surrounding steppe and forest.

I explore images of Russia and Russians from the early sixteenth century to the mid-seventeenth, finding them in maps, broadsheets, travel accounts (by Sigismund von Herberstein and Adam Olearius) and costume books. Such images were remarkably few for a century when print illustration boomed. I examine how these images were produced, taking a deep dive into patronage, design, publishing and dissemination. In so doing I end up displaying the world of European book culture more than Russia itself. Thus, this

¹ Knowledge production: Pamela Smith and Schmidt, "Knowledge and Its Making"; Mulsow, "History of Knowledge"; Burke, *Social History of Knowledge*; Stagl, *A History of Curiosity*, chap. 1; Hanss and Rublack, "Knowledge Production."

² Daston, "Observation"; Ogilvie, *Science of Describing*; Egmond, *Eye for Detail*; Kusakawa, *Picturing*; Hanss and Rublack, "Knowledge Production." See further literature cited in Chapter 1.

³ The New World: Sturtevant, "Sources"; Mullaney, "The New World on Display"; Davies, *Renaissance Ethnography*; van Groesen, *Representations*; Bucher, *Icon and Conquest*; "This Nation Is Appareled"; Keazor, "Theodore de Bry's Images"; Mason, *Deconstructing America*; Greenblatt, *Marvelous Possessions*, 6 and Introduction; Leitch, *Mapping Ethnography*, 60–64. Poland: Grusiecki, "Close Others."

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introduction lays out some current thinking about the world of printing in its formative century.

The thriving field of “history of the book” laid the foundations for studies of the production and dissemination of knowledge through imagery. Founders of the field in France explored the social and material context of book production, focusing beyond authors on publishers, engravers and printers.⁴ At the same time Elizabeth Eisenstein’s path-breaking study of the “print revolution” made an immense impact regarding knowledge production, particularly with her (and others’) concept that print created a “fixity” of text that allowed communities (scientific, confessional and other) to form around shared discoveries and views.⁵ All well and good, Adrian Johns and others have since argued, but such “fixity,” if ever achieved, was the product of long and arduous struggle by authors and publishers well into the eighteenth century.⁶

Johns argues that “print culture” in the sixteenth century started out in chaos, by modern standards. Early modern printing, he noted, did not begin with “any obvious or necessary bond to enhanced fidelity, reliability, or truth. That bond had to be forged.”⁷ Medieval manuscript culture had no firm sense that a creative work was linked to a single author (other than great, named classical authors). Going into the sixteenth century, then, there was little sense of intellectual property and no privileged claims for authors; those ideas and legal protections were hammered out, generally in the eighteenth century, starting in England.⁸ Rather, sixteenth-century practice included what we would call today plagiarism or piracy or unattributed excerpting or republication or repurposing of text and image . . . the list goes on. Johns chronicles how authors and publishers developed publication strategies to overcome skepticism about the printed word, to assure readers that the new “knowledge” their books disseminated was authentic. Establishing the readers’ “trust,” Johns reminds us, was a difficult process.

⁴ Chartier, *Cultural Uses of Print*; Chartier and Cochrane, *Order of Books*, chap. 2; Febvre and Martin, *Coming of the Book*; Finkelstein and McCleery, *Introduction to Book History*; Johns, *Nature of the Book*, 28–30.

⁵ Eisenstein, *Printing Press*; here she parallels Ivins’s similar idea that print creates fixed and replicable text: *Prints and Visual Communication*. Johns details how scholars such as Bruno Latour and Marshall McLuhan developed this concept: *Nature of the Book*, 10–19.

⁶ Johns, *Nature of the Book*, Introduction; Finkelstein and McCleery, *Introduction to Book History*, 15–20.

⁷ Johns, *Nature of the Book*, 5.

⁸ Privileges, patronage and copyright protections: Burke, *Social History of Knowledge*, chaps. 3 and 7; Chartier, *Order of Books*, chap. 2; Febvre and Martin, *Coming of the Book*, 159–66, 239–47; Finkelstein and McCleery, *Introduction to Book History*, 63–64 and chap. 4; Armstrong, *Before Copyright*; Johns, *Nature of the Book*, 36–39; Gundersheimer, “Patronage in the Renaissance”; St. Clair, “Political Economy of Reading”; Tennant, “Protection of Invention”; Trevor-Roper, *Princes and Artists*.

There were myriad such strategies. Patronage and privileges were one. Authors and artists sought patrons to support their work, particularly because institutions of knowledge production were few and scattered.⁹ Writers and artists could be associated with universities, particularly in the Germanies; in the seventeenth century national academies of sciences began to be created. But in the sixteenth century and beyond, patronage at imperial, princely and noble courts was a necessity. When an author introduced a book with lavish dedications to patrons, those words of praise honored the *mécénat* and paved the way for further support, but it also helped to authenticate an author's work by association with such eminent people.

Privileges played a similarly symbolic authenticating role. Authors and particularly publishers sought "privileges" from a political figure – emperor, municipality, notable – that forbade copying the work, usually for a fixed amount of time to allow the publisher to recoup expenditures. Privileges were weak protections, however: There was little provision for enforcement, and even then they only applied within the jurisdiction of the granting power. Symbolically, however, trumpeting an official privilege on a map or title page gave the reader a reassuring imprimatur.

Publishers also developed ways of designing a book's front matter, or paratext, to project authenticity. They heralded the stature of the author, for example, by identifying his rank on the title page and even including his coat of arms, portrait or encomia to him. In their texts, authors claimed to be writing or sketching from eyewitness, what Anthony Pagden and others call the "autopic" stance; that claim could be visually represented by depicting an artist sketching in the foreground of an illustration (Fig. 9.1).¹⁰ Signatures of engravers and authors on maps and illustrations also asserted authenticity, particularly when those individuals enjoyed a respected reputation, as we will see in our books and maps about Russia.¹¹ Over the sixteenth century, publishers designed the title page toward what we have today, with title, name of author and some identifying status for him, city, publisher and date; a privilege was cited where possible and sometimes a printer's mark verified

⁹ Such institutions of knowledge production: Burke, *Social History of Knowledge*, chap. 3; Stagl, *History of Curiosity*, chap. 2.

¹⁰ Pagden, *European Encounters*, chap. 2; Stagl, *History of Curiosity*, 79; Burke, *Eyewitnessing*. One of Herberstein's engravers, Hans Lautensack, depicted himself as a painter in a 1552 cityscape (Jeffrey Smith, "Introduction," 4). Such devices introduced in books: Burke, *Social History of Knowledge*, chap. 8; Chartier, *Order of Books*, chap. 2; Febvre and Martin, *Coming of the Book*, chap. 3; Pleij, "What and How Did Lay Persons Read." In this book I use masculine pronouns when referring to authors whose work I explore in order to reflect the fact that they are exclusively men.

¹¹ The Rothergesser brothers who engraved and signed several large prints in Olearius's tome were well known in northern Germany: Lohmeier, "Appendix II. Die Reisebeschreibung," 45; Schlee, "Kupferstecher," 17–25.

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the press (that of the Oporinus firm in Basel depicted a man playing an stringed instrument and standing on a dolphin) (Fig. I.1).¹²

Knowledge production was stymied without effective presentation. Over the century publishers also worked to make it easier for readers to acquire the knowledge contained within their books. They appealed to the myriad forms of literacy in the sixteenth century. Readers, elite and lay, could read “intensively,” taking notes, reading word for word and page by page, and writing marginalia. Or they could read “extensively,” dipping into a book for entertainment or research. In a century of massive encyclopedic works (catalogs of botany, anatomy and animals, atlases and cosmographies), the latter was common. Extensive reading was also used for reading the Bible, a practice encouraged by Protestant confessions.¹³ To aid such reading, publishers designed didactic page and book formats. They divided long texts into volumes, parts and chapters and marked those locations at the top of the page; they added indexes and bibliographies; they added notes in the margins identifying the theme of the paragraph. They interspersed graphics, such as genealogies and tables, to illustrate points.¹⁴ They titled maps but did not, as a rule, provide captions for illustrations (Chapter 9).

“Book culture” was hammered out in the fast-paced world of sixteenth-century communication. The common language of Latin offered transregional communication and helped to create communities around shared interests and publications. Publishing in the vernacular increased the audience and did not splinter the intellectual world since humanist readers were adept both in their vernaculars and in Latin. Not until the seventeenth century did such splintering happen at levels below elite science (where Latin and French endured as international languages).¹⁵ Knowledge was disseminated by many networks. The “Republic of Letters” linked communities of scientists by correspondence and travel, but not in a pan-European whole quite yet. There were many centers of knowledge production: Zurich, home of the great natural historian Conrad Gessner; the Habsburg courts; great publishing houses in Basel, Venice, Antwerp and Amsterdam; the University at Basel; Bordeaux in France. Some publishers had shops around Europe; all depended on book fairs, particularly in the Germanies at Frankfurt and elsewhere, whose catalogs listed thousands of titles circulating in the century.¹⁶

¹² Printer’s marks: Febvre and Martin, *Coming of the Book*, 84.

¹³ Elite and lay literacy: Burke, *Social History of Knowledge*, chap. 8; Finkelstein and McCleery, *Introduction to Book History*, chap. 6; Chartier, *Cultural Uses of Print*, Introduction and chap. 5; Molekamp, “Popular Reading and Writing”; Pleij, “What and How Did Lay Persons Read.”

¹⁴ Tables and graphics: Acheson, *Visual Rhetoric*, Introduction and chap. 2; Burke, *Social History of Knowledge*, 183–84.

¹⁵ Febvre and Martin, *Coming of the Book*, 330–32.

¹⁶ Book fairs: Febvre and Martin, *Coming of the Book*, chap. 7.

RERVM MOSCOVITI-
 carum Commentarij Sigismundi
 Liberi Baronis in Herberstein,
 Neyperg, & Guettenhag:

R V S I AE, & quæ nunc eius metropolis est, Mo-
 scouiae, breuissima descriptio.

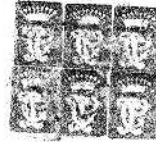
Chorographia deniq; totius imperij Moscici, & uicino-
 rum quorundam mentio.

De religione quoq; uaria inserta sunt, & quæ nostra cum re-
 ligione non conueniunt.

Quis deniq; modus excipiendi & tractandi Orato-
 res, disseritur.

Itineraria quoq; duo in Moscouiam, sunt adiuncta.

*Ad hæc, non solum nouæ aliquot Tabulæ, sed multa etiam alia nunc demum ab
 ipso autore adiecta sunt: quæ, si cui cum prima editione conferre li-
 beat, facile deprehender.*



Cum Cæs. & Regiæ Maiest. gratia & privilegio
 ad decennium.

BASILEÆ, PER IOAN-
 nem Oporinum.

Musæi
 Joannis Baptistæ Vifi
 Mantuani.

Figure I.1. Sigismund von Herberstein, *Rerum moscovitarum commentarii* (Basel, 1556), title page. Sigismund von Herberstein, *Rerum moscovitarum commentarii* (Basel, 1556), Beinecke Rare Book and Manuscript Library, Yale University

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All this effort to authenticate publications was not immediately accomplished, of course. It pushed against the reality that it was easier for publishers to make money by plagiarizing books and cutting-and-pasting excerpts from many sources than to support a new work, as the fate of Sigismund von Herberstein's travel account demonstrates (Chapter 4). Lucien Febvre and Henri-Jean Martin note that piracy was often the only way for a smaller printer to survive.¹⁷ Furthermore, "knowledge" about the broader world was disseminated not only in books and maps whose publishers were conscientious about truth value but also in many less scrupulous genres, particularly broadsheets. There the scandalous and wondrous played fast and loose in text and image. Particularly with the visual, print culture struggled to create and enforce standards for ensuring that a visual image represented what it purported to depict.

That fact is all the more distressing since the visual was one of the central, even *the* central, medium in the presentation of new knowledge in sixteenth-century Europe. Dana Leibsohn argues that "increased emphases on optical authority" were humanist Europe's response to the flood of new information it encountered or produced.¹⁸ Despite some Protestant distrust of imagery, religious imagery continued to be the most common form of the visual, but more and more secular imagery appeared.¹⁹ Scholars embraced the visual to display their growing categorization of the world's flora and fauna, of anatomy, technology and geography. The sixteenth century saw a boom in cosmographies and collections of portraits, costumes and atlases, all illustrated; by the end of the century travel literature leaped on to the illustration bandwagon (Chapters 1 and 7).²⁰

Encounters with foreign lands and the creation of new knowledge required new ways of "making what was seen knowable and rendering the unknowable visible."²¹ Artists and publishers turned to the "visual culture" of their time to apprehend all this new stimuli.²² They constructed ways of depicting based on

¹⁷ Febvre and Martin, *Coming of the Book*, 239–42. St. Clair argues that by the eighteenth or early nineteenth century lower classes who could afford only cheaper books were reading outdated literature and knowledge, while only elite readers who could afford the physically larger and more expensive new books were keeping up with the times: "Political Economy of Reading."

¹⁸ Leibsohn, "Geographies of Sight," 1. Gillian Rose develops this point: *Visual Methodologies*, 1–4.

¹⁹ Religious imagery: Chartier, *Cultural Uses*, 161; Febvre and Martin, *Coming of the Book*, 248–56. By the seventeenth century, genre painting had become a ubiquitous style in northern Europe: Difuria, "Genre: Audience."

²⁰ Hanss and Rublack ("Knowledge Production") discuss many such compendia. Botany: Egmond, *Eye for Detail*; Ogilvie, *Science of Describing*; Kusukawa, *Picturing*.

²¹ Leibsohn, "Geographies of Sight," 1.

²² Visual culture: Bartholeyns, "History of Visual Culture"; Eck and Winters, *Dealing with the Visual*; Jeffrey Smith, "Introduction"; Leibsohn, "Geographies of Sight"; Gombrich, *Art and Illusion*; Rose, *Visual Methodologies*; Howells and Negreiros, *Visual Culture*; Stuart Hall, et al., *Representation*; Freedberg, *Power of Images*; Bartholeyns, "History of Visual Culture"; Eck and Winters, "Introduction"; Burke, "Images as Evidence" and *Eyewitnessing*.

their own social and intellectual backgrounds. As Margaret Topping remarks, “We never simply see the world in a direct, unmediated sense-perception; rather, what we see and how we see are always conditioned by the observer’s specific conjunction of ‘field’ and ‘habitus.’” Deploying Pierre Bourdieu’s categories – “field” being the social, cultural, political and economic frameworks that one inhabits and “habitus” the “second-nature” attitudes one absorbs from that field – Topping reminds us that as readers and viewers we adapt the new to categories, narratives and imagery that we already know.²³ In creating images of Russia and Russians or steppe nomads and forest people in the sixteenth century, Europeans generally did not create fantasies (with some exceptions), nor did they convey snapshots of reality. Rather, travelers and artists used a range of conventions (including familiar stereotypes and artistic techniques such as perspective, composition, repetition and text) to make sense of the new. Many professionals were engaged in the process – authors, engravers, printers, publishers – which usually meant that the image strayed far from an eyewitness sketch or an original intent. Artists transformed eyewitness observation of foreign cultures for the European market: They classicized and modernized people and scenes; they bowdlerized sketches made by eyewitness observers; they repurposed and invented imagery. They applied biblical and classical categories to make the unfamiliar familiar. By the seventeenth century debates about the New World had flipped the evidence to create “a new paradigm of cultural difference,” and visual culture provided symbolic vocabularies for such depictions as well.²⁴

Jeffrey Chipps Smith argues that the turn to the visual reflected its flexibility of impact. Imagery could “heighten experience” in a century of religious fervor and proselytism, of encounter with “monstrous” peoples and creatures from abroad. Imagery could also epitomize whole concepts of self and society. Books of “emblems” symbolizing concepts taught readers how to interpret the symbolism of a rose, or a dog, or other motifs they would encounter in art and domestic decoration such as tapestries. In our world of primarily ethnographic imagery of Russia and points east, such tropes were more straightforward. Readers and viewers came to understand that cityscapes in *veduta* form – the urban skyline with scenes in the foreground – connoted a sort of European civilization, while fur clothing and camels epitomized barbarity. In the circulation of images in sixteenth-century print culture, some that started out as eyewitness became transformed into emblem-like symbols and or mere decorative embellishment.²⁵

²³ Topping, “Travel Writing,” 78.

²⁴ Pamela Smith and Schmidt, “Knowledge and Its Making,” 7, 14–15.

²⁵ Jeffrey Smith, “Introduction.”

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Confronting the flood of the visual in the sixteenth century, in a setting where “print culture” started out with few guidelines for truth, viewers had to develop what Smith calls “visual acuity.” They looked for labels such as “*contrafactum*” to suggest true image; they compared text and image, and they used common sense, particularly in enjoying the sensationalism of European broadsheets. Humanist scholars made consistent efforts to define visual strategies to represent “truth to nature,” as I discuss in Chapter 1.²⁶ But their conscientiousness was missing in much other use of the visual: It was too expensive. In the wild and woolly world of print culture, efficiency and cost-cutting generally shaped how imagery was produced; even if given sketches based on eyewitness, producers often redesigned them.²⁷

Such improvisations and a resort to tropes were particularly evident as publishers looked across the Atlantic and to the East. Humanists were as eager to explore the Ottoman Empire, Persia, India and China as they were to discover the New World and test it against the classical scholarship they had been taught. Russia and its forest and steppe borderlands posed a difficult challenge, as they sat between familiar Europe and the exotic cultures of the New and Old Worlds. Here humanist-trained travelers encountered the familiar – what looked like a monarchy and nobility, towns and artisans, a peasant-based agrarian economy, Christianity (in the Orthodox variant) – and the unfamiliar or unknown – serfdom and a centralized bureaucratic empire, nomads of the steppe and tribes of the Siberian forest. Observers had to make complex adjustments to assess Muscovy, the steppe and beyond.

The various European engagements with Russia and its borderlands represented in our imagery were rarely based on direct encounters. Tomasz Grusiecki has chronicled how Dutch artists in the seventeenth century created a range of images of Poles as “close others,” whom the Dutch saw both as familiar because of the many day-to-day encounters with Poles on the streets of Amsterdam in a century of the booming Polish grain trade and as different because of the exotic robes, sashes and swords of the Polish Sarmatian style.²⁸ But Europeans did not have the opportunity to see Russians regularly. A few Muscovite diplomats traveled, but not merchants; a few European diplomats and merchants went to or through the Russian Empire and returned with impressions. But European interest in Muscovy – sparked by its diplomatic overtures to the West, by European desires to cross Muscovy to the Silk Road or by the humanistic desire to describe the known world – confronted a

²⁶ “Truth to nature”: Daston and Galison, “Image of Objectivity,” 84; Jeffrey Smith, “Introduction.”

²⁷ Interaction of author, engraver, publisher and print process: Dackerman, “Prints as Instruments,” 19; Kusukawa, *Picturing*, chaps. 1–4.

²⁸ Grusiecki, “Close Others.”

vacuum of information. Russians were not “close others” but neither were they complete aliens. Muscovy’s steppe and forest neighbors, however, did indeed seem alien. So Europeans had to fit Muscovy into their visual culture.

Here we will explore how practices of early modern visuality and print culture were implemented when Europeans encountered Muscovites and their neighbors. We will consider a range of perspectives on how an image conveys information and emotional impact. Dress, bodily pose, gesture, composition – all might associate Russia semiotically with the familiar or make it seem exotic. The social context of an image’s production – who commissioned, designed and published it, the genre in which it was set – also shaped meaning.²⁹ Meaning could be altered again as imagery moved into new publications and new genres.

We find our images in travel accounts, such as those by Sigismund von Herberstein (1549) and Adam Olearius (1647, 1656), and in maps, broadsheets, costume books and occasional other sources. We will find no single visual interpretation of Russia, no consensus in learned discourse, no authoritative institutional source. Rather, Europeans were presented with many views of Russia in many genres, written with different purposes by different authors and circulating in different knowledge communities. Our sources focus on a few geographical areas where most visual depictions of Russia circulated. The Holy Roman Empire and its German-speaking lands constituted one; England with its artistic and trade connections with the Dutch was another; Italy with Venice’s voluminous publication of maps and costume books yet another.³⁰ The Dutch “art of describing” extended far beyond its borders,³¹ as did Dutch mapping (where we find decorative images of Russians), since Latin was usually the first language of publication of maps, and Dutch booksellers had international networks. There was no one Europe to which a single story about Russia could be disseminated; rather, we will discern the many ways in which Europeans presented Muscovy and its borderlands.

Scholars of Russia have been interested in the visual, but not quite in this way. Most attention has been, sensibly, on work produced in Muscovy itself. Scholarship on Russian iconography from imperial Russia through Soviet times to the present is vast and distinguished.³² Western scholars have built

²⁹ Rose defines such methodology systematically: *Visual Methodologies*, 12–27.

³⁰ I do not include France because its depictions of Russia in cosmographies, travel accounts and maps are rare and derivative.

³¹ Alpers, *Art of Describing*.

³² A footnote cannot do it justice. Exemplary are Grabar’, *Istoriia russkago iskusstva* and any of Engelina Smirnova’s works, including *Zhivopis’ Velikogo Novgoroda*, *Litsevye rukopisi Velikogo Novgoroda, XV vek* and *Ikony Severo-Vostochnoi Rusi*.

on it, often bringing in semiotic, anthropological or other angles to Muscovite visibility.³³ As for European images of Russia, D. A. Rovinskii's collections of European engravings are encyclopedic, while on portraiture Frank Kämpfer and Ursula Mende have provided a more critical analysis.³⁴ Early modern European maps of Russia have been analyzed for cartographic advancements, but little attention has been given to their decorative features.³⁵ No one has looked at early modern European images of Russia as a body of information shaped by humanism and the evolving world of print culture.

We begin with the first visual encounters with Russia through mapping and diplomacy in the early sixteenth century and end with the magisterial blending of text and image in the travel account (1656) of Adam Olearius, who has been called "a late humanist."³⁶ We close there, at mid-seventeenth century, when Europeans' exposure to Russia significantly increased, as newspaper coverage and mail services were being developed and more Europeans traveled to Russia and returned. It was a time when the European art of the Baroque flooded in from Ukraine, and the Russian court began to produce secular images of its members, as I discuss in the Conclusion. Information about Russia became more normalized; in the era we are considering, Russia was still a rare object.

We also end at mid-seventeenth century because the visual world was taking a turn toward a more categorical approach to foreign cultures. From the seventeenth century a more rational, critical assessment of human experience began to establish boundaries between the "scientific" and the "wondrous"; disciplines were beginning to be carved out. Europeans began conceptualizing hierarchies of civilization and producing exclusionary or exoticizing rhetoric for non-European lands.³⁷ We will see some of this already with Olearius. Visuality proliferated even more but the openness of humanist information-gathering and the exuberance of "Baroque curiosity" were being tamed.

The chapters move chronologically from about 1500 to about 1650 and describe an arc from imagery intended to be iconographic or that became so

³³ Flier, "Court Ceremony" and "Breaking the Code"; Rowland, "Architecture, Image, and Ritual" and "Two Cultures"; Franklin, *The Russian Graphosphere*; Kivelson, *Cartographies of Tsardom*; Kivelson and Neuberger, eds., *Picturing Russia*; Kivelson, et al., eds., *Picturing Russian Empire*; Monahan, "Binding Siberia," "Moving Pictures" and "Tents or Towns."

³⁴ Rovinskii, *Dostovernnye portrety, Russkie narodnye kartinki, Podrobnyi slovar' russkikh grave-rov XVI-XIX vv. and Podrobnyi slovar' russkikh gravirovannykh portretov*; Kämpfer, *Das russische Herrscherbild*; Mende, "Westeuropäische Bildzeugnisse."

³⁵ The classic is Bagrow, *History . . . up to 1600*; see also Postnikov, *Russia in Maps*.

³⁶ Matthee, "Safavids under Western Eyes," 140.

³⁷ Exoticizing: Benjamin Schmidt, *Inventing Exoticism*; Bucher, *Icon and Conquest*; van Groesen, *Representations*; Carina Johnson, *Cultural Hierarchy*, chaps. 4–6; Hodgen, *Early Anthropology*; Rubiés, "Travel Writing and Humanistic Culture," 142–44; Grafton, *New Worlds*, 120–26 and chap. 5; Christine Johnson, *German Discovery*, 11–15 and Conclusion.