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Cross-cultural Currents and Syncretism in Early Modern Opossum Iconography

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CROSS-CULTURAL CURRENTS AND SYNCRETISM IN EARLY MODERN OPOSSUM ICONOGRAPHY

by

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Submitted in Partial Fulfillment of the
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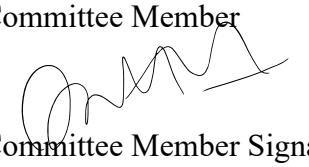

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A Thesis Submitted to the Faculty of the School of Arts, Media, and Communications
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ABSTRACT

Title of Thesis: Cross-cultural Currents and Syncretism in Early Modern Opossum Iconography

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Opossums (Order Didelphimorphia) are marsupial mammals endemic to the Americas. They are also the first marsupials Europeans ever encountered, over a century before any Australasian species. Because of their unique marsupial characteristics, opossums have historically been viewed as an "anomalous" animal form across both Indigenous American and European cultures, and thus developed a rich and complex transatlantic cultural history. By tracing the development of opossum imagery through the millennia, one can uncover clear patterns of how their distinct features became embedded in iconographies relative to biogeocultural sphere, and how certain iconographic conventions were transmitted through various media both within and between cultures. The single most important flashpoint in this historical visual timeline was the transatlantic convergence of cultures post-1492, as this was the catalyst which not only jumpstarted this visual record on the European side, but also curtailed it for centuries on the Indigenous American side. While European opossum images proliferated, a once diverse and widespread Indigenous American iconography was all but erased within a generation of conquest. However, it appears at least a few opossums managed to survive this apparent iconographic extinction, embedded within the imagery of early Spanish colonial projects illustrated by Indigenous artists, while Indigenous ethnozoological knowledge also influenced the production of European images. This thesis will examine how, through cross-cultural currents and syncretic processes, opossum iconography developed on both sides of the Atlantic during the Early Modern Period (fifteenth through eighteenth centuries), with an emphasis on where and how Indigenous knowledge survived in this visual record.

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Chapter 1: Introduction

Opossums (Order Didelphimorphia) are marsupial mammals endemic to the temperate and tropical Americas (Fig. 1). They are, in fact, the dominant marsupial clade across these continents, accounting for 116 of the 124 documented species – although once one travels north of Mexico, there is only one (Fig. 2).[1] Opossums have long been familiar native animals to a great many Indigenous American cultures, with Paleo-Americans having been to first humans to encounter opossums during their migration into and through the Americas during the late Pleistocene Period (before 12,000 BCE). In contrast, Europeans had no knowledge of these animals until relatively late in their cultural history, becoming aware of their existence only after finding their way across the Atlantic in 1492.[2] They are also the first marsupials Europeans ever encountered, over a century before any of the now more well-known Australasian species; these American marsupials were first recorded by Europeans in 1500, whereas the earliest reliable account of an Australasian marsupial sighting dates to 1629.[3]

Because of their unique marsupial qualities, opossums have historically been viewed as an "anomalous" animal form across both Indigenous American and European cultures, and as such developed a rich and complex transatlantic cultural history.[4] Opossums were incorporated

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[1] Robert S. Voss and Sharon A. Jansa, *Opossums: An Adaptive Radiation of New World Marsupials* (Baltimore: Johns Hopkins University Press, 2021), 3, 9-10. The other eight marsupial species are the seven Shew Opossums (Paucituberculata) and the Monito del Monte aka Colocolo Opossum (*Dromiciops gliroides*), none of which, despite their common names, are true opossums. The Virginia Opossum (*Didelphis virginiana*) is the only opossum, and only marsupial, found north of Mexico, and with a range which reaches into southern Canada is also the world's northernmost marsupial.

[2] While the Norse had previously crossed the North Atlantic in the late tenth century, they do not appear to have traveled further south than the subarctic zone, which is beyond the northernmost range of opossums; it is thus highly unlikely they encountered them first.

[3] Louise Rice, "Villamena's Kangaroo," in *Humanism and Creativity in the Renaissance: Essays in Honor of Ronald G. Witt*, eds. Christopher S. Celenza and Kenneth Gouwens (Leiden: Brill, 2006). Rice further notes that after this single 1629 report, no further sightings of Australasian marsupials were reported by Europeans until the very end of the seventeenth century.

into the foundational cosmological beliefs of Paleo-American cultures, and were subsequently deified in Indigenous American mythology, canonized in oral traditions, and utilized in ritual and medicine. Meanwhile, Europeans first encountered opossums while being simultaneously confronted with not only a plethora of other novel flora and fauna, but unfamiliar human cultures as well. Opossums thus became entangled in the ensuing European "othering" of the New World.[5] However, they were also readily integrated into existing allegorical and emblematic traditions, and ultimately even helped spur the development of modern zoological science. Additionally, the opossum's robust reproductive fecundity and fertility and extended maternal care inspired similar associations with human maternity on both sides of the Atlantic, with additional gendered associations developing specific to each sphere.

The opossum's cultural significance across such a wide expanse of time, geography, and culture is also attested to in the visual record. By tracing the history of opossum imagery through the millennia, one can uncover clear patterns of how their distinct morphological and behavioral features became embedded in iconographies relative to biogeocultural sphere, and how certain iconographic conventions were transmitted through various media both within and between cultures.[6] Without a doubt, the single most important flashpoint in this historical visual timeline was the transatlantic convergence of cultures post-1492. The exploration and subsequent

[4] For more on the concept of "anomalous" animals in human cultures, see Elizabeth P. Benson, *Birds and Beasts of Ancient Latin America* (Gainesville: University Press of Florida, 1997), chapter 5.

[5] It is fully recognized that the terms "New World" and "Old World" are inherently problematic and are thus used sparingly and always within the context of European perception. Unfortunately, these terms are embedded even in zoological lexicon and thus difficult to avoid entirely. "The Americas" and "American" will be the preferred alternatives to refer to the whole of North America, Central America, South America, and the Caribbean.

[6] The term "biogeocultural sphere" is used here to acknowledge the fact that, even while both the Americas and Europe are populated by diverse cultures which generally should not be homogenized, there are nonetheless certain broad ecological heritages shared by virtue of the mechanisms of biogeography. In the case of opossums, these spheres are dictated by continental range and oceanic divide; these animals are found over a wide expanse of the Americas, and *only* the Americas, which made them familiar animals to a great many Indigenous American cultures while also being completely unknown to any European culture prior to their ability to cross the Atlantic.

conquest and colonization of the Americas by Europeans not only served as the catalyst which jumpstarted this visual record on the European side, but also the one which curtailed it for centuries on the Indigenous American side. While Europeans propagated opossum images from the sixteenth century onward, the opossum's once diverse and widespread Indigenous American iconography was all but erased within a generation of the Spanish Conquest of 1521.

However, it appears at least a few opossums managed to survive this apparent iconographic extinction, embedded within the imagery of early Spanish colonial missionary art. These projects were illustrated by Indigenous artists, who used their agency to incorporate knowledge of native fauna and flora into the works. Furthermore, one can see the clear influence that access to this rich knowledge base had on the production of early European images, as the scientific accuracy of these images improved dramatically once European naturalists began to integrate Indigenous ethnozoological knowledge into their understanding of this confounding new animal. This thesis examines how, through cross-cultural currents and syncretic processes, opossum iconography developed on both sides of the Atlantic from the time just before the Spanish Conquest through the early eighteenth century, with an emphasis on where and how Indigenous knowledge survived in this visual record.

Zoological Images as Science and Art[7]

Historical images of animals have long been of interest to scholars of both natural history and art history. Although there has been an increasing recognition of the inherent intersectionality of science and art in general, and especially with regards to the study of zoological images, it can be generally observed that such study has traditionally focused more on either a scientific or artistic orientation. This orientation has in turn been based upon conventional lines of what kinds of visual records have been deemed natural history art and scientific illustration (e.g., print illustrations in published works, mostly "Western") and what have not (e.g., individual works of fine and applied arts, and much of Indigenous visual culture).[8] The present study seeks to break down these old delineations and hierarchies and instead give equal consideration to images through the inclusive lens of modern visual culture studies.

One of the consequences of this historical disconnect between natural history and art history scholarship has been the latter being rife with animal images which have been misidentified, under-identified, or escaped identification altogether. Opossums are unfortunately not exempt from this; images are rarely identified in the literature by formal taxa outside the

[7] For the purposes of this study, "science" refers to the modern discipline which seeks to systematically build knowledge about the universe through testable explanations derived from observation and experimentation, and likewise "natural" refers to the physical, material world which is the purview of this discipline. Within this framework, "zoology" is recognized as the scientific study of the animal kingdom as it exists in the natural world. While this study is firmly rooted in a modern zoological understanding of the opossum's natural history, it is also recognized that Indigenous American paradigms – and even pre-19th Century European ones, for that matter – may not always make the same distinctions between natural and supernatural, material and spiritual, etc. Being aware of this fact is essential to properly reading the scientific information contained within images, and these cultural perspectives will be considered in the analysis through the lenses of ethnozoology and the history of zoology, as outlined in the research methodology section.

[8] This issue is noted by Enenkel and Smith: "Most studies of animals in early modern literature and the visual arts tend to foreground the symbolic significance of the animals represented, neglecting somehow their zoological reality or their natural-historical conceptualisation…. Studies that follow a more 'naturalistic' perspective…are indeed rare. Indeed…painting [is] so much closely connected with zoology that it is often impossible to arrive at a clear-cut distinction between the fields…. [This] confusion can be observed with respect to the borderline between zoological illustrations (i.e., illustrations made for a zoological publication) and more 'artistic' paintings." Karl AE Enenkel and Paul J. Smith, "Zoology and the Arts," in *Early Modern Zoology: The Construction of Animals in Science, Literature and the Visual Arts* (Leiden: Brill, 2007), 7-8.

realm of traditional scientific scholarship, even when such an identification is easy to make, and at least a few clear cases of misidentification exist. For example, a number of illustrations in an album held by the British Museum and identified in their records as likely opossums are actually coatis (*Nasua* and *Nasuella* spp.), a different American mammal (and not a marsupial) (Figs. 3a, 3b).[9] Coati confusion permeates the Indigenous American visual record as well, with numerous examples of works identified as coatis which are more likely opossums, and vice versa (Figs. 3c, 6e). This issue is complicated by the significant overlap in not only opossum and coati geographic range and basic morphology, but also regional iconography, such as the common "paws-to-snout" gesture (Figs. 3c, 6e, 7a).[10] Such issues highlight the need to better integrate a scientific lens into the study of opossum (and coati) iconography, something which the present study demonstrates.

Related to the intersection of scientific and artistic aspects of zoological images is the perception of naturalistic versus symbolic iconography. In some cases, these images function as semiotic icons, as they are meant to directly represent real-life animals. For example, opossums depicted in "paper zoos" can be read as signifiers of the historical existence of original

[9] I reported these misidentifications to the British Museum via their collections website and received a reply thanking me for my feedback and noting my comments were being forwarded to the appropriate department. It remains to be seen if and when the online curator notes will be updated to reflect the correct identifications.

[10] The meaning of this gesture, seen often not only in opossum and coati effigies, but also armadillos, remains uncertain. Elka Weinstein observes that "these animals have relatively agile fingers and hands which they use for eating and grooming…but the action which is depicted on the ceramics does not seem to be either eating or grooming. The purpose of this action is therefore somewhat perplexing." Weinstein suggests one possibility is that it is meant to represent the animal playing its nose like a flute, citing South American myths which include this action; and, in fact, some of these ceramics did function as small instruments such as ocarinas and rattles. Rebecca Stone-Miller offers a few additional ideas, including to simply draw attention to the snout as a prominent physical feature; to represent eating (though it should again be noted that neither opossums nor coatis generally eat in this way); or as a playful gesture referencing ritual clowning (which both animals are associated with). See Elka Weinstein, "The Serpent's Children: The Iconography of the Late Formative Ceramics of Coastal Ecuador" (PhD diss., University of Toronto, 1999), 188-9, and Rebecca Stone-Miller, *Seeing with New Eyes: Highlights of the Michael C. Carlos Museum Collection of Art of the Ancient Americas* (Atlanta: Michael C. Carlos Museum, 2002), 130-1.

specimens which often no longer exist (e.g., Fig. 14).[11] However, in other cases, images are clearly imbued with a primarily ritual purpose (e.g., Fig. 6) or allegorical function (e.g., Fig. 12). While scientific images have tended to be analyzed more as literal, and other images more as symbolic, often in relation to the scholarly divisions noted above, images can easily hold a mixture of both types of information. This is especially important to consider for opossum images, as their status as anomalous animals has meant their unusual marsupial traits have been the subject of both systematic observation and symbolic association. Therefore, this study conducts a joint reading of naturalistic and symbolic iconography.

Zoological Images as Markers of the Columbian Exchange[12]

Mauricio Nieto Olarte has criticized traditional accounts which imply Europeans simply trekked across the American landscape and discovered its natural wonders on their own – "on the contrary, the only method of knowing the medical virtues of plants [or] dealing with strange animals…was to learn from the natives."[13] Olarte therefore asserts we must work to better understand the operating dynamics between Indigenous and European knowledge systems for understanding the natural world, especially "the appropriation, mobilisation, and translation" of the former by the latter.[14] Animals such as opossums which are endemic to the Americas, and

[11] "Paper zoo" refers to the creation and collection of images on paper which serve as a lasting visual record of impermanent animal specimens, a common and necessary practice before the advent of photography (and modern preservation and taxidermy techniques). While some of these works were subsequently bound into albums, others were also copied and traded amongst networks of collectors and naturalists as a means of circulating visual knowledge, with many also becoming templates for published illustrations. See Charlotte Sleigh, *The Paper Zoo: 500 Years of Animals in Art* (Chicago: University of Chicago Press, 2017).

[12] "Columbian exchange" refers to the transatlantic biological exchange which developed between Europe, West Africa, and the Americas post-1492, including wild and domesticated animals, wild and cultivated plants, and disease (and in an even broader context, humans).

[13] Mauricio Nieto Olarte, "Scientific Practices in the Sixteenth-Century Iberian Atlantic," in *Theorising the Ibero-American Atlantic*, eds. Harald E. Braun and Lisa Vollendorf (Leiden: Brill, 2013), 152.

[14] Olarte, "Scientific Practices in the Sixteenth-Century Iberian Atlantic," 152.

thus were previously totally unknown to Europeans, can make fruitful case studies for pursuing this line of inquiry, because there is both a clearly defined temporal point of contact *and* biogeographical boundary from which we can track the cross-cultural currents which ensued.

However, just as scholarship has been traditionally focused on more of a scientific or artistic orientation, so too has scholarship traditionally focused on either Indigenous American or European visual culture. This, in turn, has hampered the potential of these images to inform studies of how both physical nature and ideas about the natural world were exchanged in the aftermath of 1492. Therefore, this study conducts a joint reading of pre-conquest Indigenous American and post-conquest Colonial and European visual records.

Scope of the Study

Indigenous American Visual Records

While opossums range across a wide expanse of the Americas, and likewise can be found referenced in the oral traditions of many Indigenous cultures throughout these lands, the bulk of the historical visual record is located in the Mesoamerican and Andean regions.[15] Within the Mesoamerican realm, the surviving record is scattered across most of the major pre-conquest cultures, including a variety of three-dimensional objects (ceramics, sculpture, etc.) from the Olmec, Maya, Toltec, Aztec, Mixtec, and Zapotec, and illuminated manuscripts (called codices) from the Maya, Aztec, and Mixtec. Meanwhile, the Andean examples are mostly limited to small-scale three-dimensional objects from coastal Ecuadorian cultures. The reasons for the concentration of imagery in a relatively limited portion of their much wider range can only be partially explained by their natural distribution. While in the case of cultures north of Mexico

[15] I have also found smaller pools of examples from the Southeastern U.S. (Mississippian culture) and the Caribbean (Saladoid culture); unfortunately, there are only a few poorly documented examples and sparse scholarship available for the Mississippian culture, while the Saladoid culture predates the temporal scope of this study (see footnote 17).

there is only a single species present, the richest diversity of opossum species actually occurs in Amazonia, where they are also well-represented in regional lore (Figs. 1 and 2).[16] While the geographic discrepancies between natural distribution, presence in oral traditions, and prevalence in visual culture could be due to inherent regional differences in the cultural importance placed on visually representing opossums, there are likely also external factors at play, including that these other areas have not been as well-studied in the scholarship; fewer works have survived from them; and/or surviving pieces may currently be unidentified or misidentified in official records.[17] Regardless, the scope of inquiry on the Indigenous American side is bound by these limitations.

Furthermore, as this thesis is concerned with issues of transatlantic convergence and syncretism, the focus is on those cultures still extant in 1492 (although earlier works are also referenced to illustrate the origins and longevity of certain iconographic conventions). As opossums almost entirely disappear from the visual record of these cultures from the time of the Spanish Conquest until their limited re-emergence in the folk art of postcolonial cultures, the temporal scope of inquiry in this realm is largely disjunct from that of the European one (see next section). However, a trio of exceptional cases from the sixteenth century, which were the product of Nahua artists working under the direction of Spanish missionaries, will provide some opportunity to explore hybridity in early colonial art.

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[16] In addition, this single species, the Virginia Opossum, is more likely to produce only one litter per year in colder regions, versus multiple litters in warmer regions, perhaps slightly diminishing their reputation for exceptionally prolific fertility in the more northern cultures. On the other hand, as the sole marsupial present, it should have been seen as an even more of an anomalous animal than in those regions where there are multiple sympatric species. As for Amazonia, there is certainly no lack of opossum characters in stories, with Claude Lévi-Strauss devoting an entire chapter to them in his *Mythologiques* anthology; see "The Opossum's Cantata," in *The Raw and the Cooked: Mythologiques, Volume 1* (New York: Harper & Row, 1969), 164-98.

[17] Additionally, in visual cultures where composite animal imagery is a common convention, opossum iconography is likely embedded within zoomorphic forms, still awaiting proper identification.

European Visual Records

As noted above, the commencement of the visual record of opossums in Europe can be definitively dated to 1516 CE, in the form of a map icon (Fig. 11a). Opossum imagery is present in a wide variety of European media, though in many cases, these works are iterations of a relatively small pool of original images which were circulated via print media (see Figs. 13e and 15a for examples). While the focus of the study is on images produced through the first half of the eighteenth century, related images produced through the early nineteenth century are also referenced. These include images produced both in continental Europe and in the Americas as part of a colonial or postcolonial presence. Furthermore, the European scope is limited to what is generally now known as southern, western, central, and northern Europe; the majority of eastern and southeastern Europe was at this time under control of either the Russian or Ottoman empires, neither of which will be covered here.[18]

[18] However, it is worth recognizing the existence of a unique Ottoman illuminated manuscript from c. 1580 which reported on American fauna and flora via Italian source material. This book, the *Tarihi-i Hind-i Garbi*, is the first known book from east of Venice to report on the Americas and, on plate 12, includes a fanciful illustration meant to depict an opossum raiding a chicken coop. See Thomas D. Goodrich, *The Ottoman Turks and the New World: A Study of Tarih-i Hind-i Garbi and Sixteenth-Century Ottoman Americana* (Wiesbadem: O. Harrassowitz, 1990). It should also be noted there is a cache of illustrations in the Archives of the Academy of Sciences in Leningrad which appear to be direct copies of the Dutch Brazil originals, including each of the three opossum images covered in this study (Figs. 9d,e,f); and, given the fact that Czar Peter the Great not only purchased entire natural history collections from Albertus Seba and Frederik Ruysch, but also employed Maria Sibylla Merian's daughter Dorothea for many years as an artist and curator, there may well be other contemporary opossum illustrations in Russian archives still awaiting discovery. See M. Boeseman, L.B. Hultquist, M.S. Hoogmoed, and C. Smeenk, "Seventeenth Century Drawings of Brazilian Animals in Leningrad," *Zoologische Verhandelingen* 267, no. 28.xii (1990): 1-189, figs. 1-43; and Ella Reitsma and Sandrine A. Ulenberg, *Maria Sibylla Merian & Daughters: Women of Art and Science* (Amsterdam: Rembrandt House Museum, 2008), 235-7.

Chapter 2: Literature Review and Methodology

Indigenous American and European visual records of opossums have rarely been considered in direct relation to each other, with scholarship generally focused on one or the other. Exceptions are few and far between, and not recent, such as Charles Eastman's "Early Portrayals of the Opossum" from 1915 – and even this volume mainly focuses on the European side, offering only a brief consideration of Indigenous American images at the end.[19] It is Carl Hartman's 1952 book *Possums* which remains unique in its holistic contribution to the literature, as it offers a comprehensive wide-ranging survey of the opossum's natural history, cultural history, and art history which seamlessly integrates these usually separate domains.[20] As it was written 70 years ago, some of the scientific facts and cultural perspectives are understandably outdated. Nonetheless, it remains a valuable source for its transatlantic inventory of both visual records and oral history still unparalleled in any other single available source, and likewise can serve as a model of inclusivity for modern studies.

Indigenous American Visual Records

General Observations

Although opossum iconography can be found in the visual records of Indigenous cultures across their American range, most of the works considered in the scholarship are either

[19] Charles Eastman, "Early Portrayals of the Opossum," *American Naturalist* 49, no. 586 (1915): 585-94.

[20] Carl G. Hartman, *Possums* (Austin: University of Texas Press, 1952).

Mesoamerican or Andean in origin.[21] While there does not appear to be any scholarship focused solely on Indigenous American opossum depictions, one can find a number of works which include them as part of wider iconographic investigations. These identifications are typically aided by formalist analysis and a visual culture studies perspective, along with varying degrees of scientific methodology, and generally also fall under the purview of ethnozoology.

Mesoamerican Art

General Studies on the Significance of the Opossum in Mesoamerica

There are a trio of works which are focused on the opossum's widespread and enduring place in the Mesoamerican consciousness. These all give considerable attention to examining the opossum's place in visual culture, with iconographic readings informed by an ethnozoological synthesis of scientific knowledge (e.g., biogeography, morphology, behavior) and cultural knowledge (e.g., their connections to oral traditions, deities, cosmology). Taken together, these works help elucidate why opossum iconography appears to be so prevalent in this region.

The first is Henry Munn's "The Opossum in Mesoamerican Mythology," which traces the ancient origins of what is described as "the constellation of ideas associated with the opossum in Mesoamerica, which are significantly different from, although related to, those

[21] Although the Saladoid culture falls outside this study's temporal scope as it flourished from c. 500 BCE to 545 CE, it is nonetheless also worth acknowledging the scholarship of Lawrence Waldron, who has documented the prevalence of opossum iconography in their ceramics. As the only surviving examples of opossums in pre-conquest Caribbean art found, they provide valuable evidence of this animal's cultural history in the region where the first European encounters with Indigenous Americans took place, Furthermore, one of the European images considered here, Plumier's opossum (Fig. 9h), likely originated in Martinique, an island formerly occupied by the Saladoid, and was given an Indigenous name still in use (see analysis). Waldron notes how identifiable representations of distinctive opossum morphology were rendered, at times even to the species level; such details attest to this early culture's familiarity with these animals in real life and illustrate the depth and breadth of the ethnozoological knowledge which Europeans such as Plumier would later draw upon. See primarily *Handbook of Ceramic Animal Symbols in the Ancient Lesser Antilles* (Gainesville: University Press of Florida, 2016), and *Like Turtles, Islands Float Away: Emergent Distinctions in the Zoomorphic Iconography of Saladoid Ceramics of the Lesser Antilles, 250 BCE to 650 CE* (PhD diss., CUNY, 2010).

surrounding it in South America…and the southeastern United States."[22] In comparing and contrasting common beliefs found in these three broad geo-cultural spheres of the Americas, Munn states his aim is to reveal how "the conception of the animal in Mesoamerican mythology and iconography is a unique synthesis, created by a particular cultural context, of a widespread group of common beliefs;" in doing so, Munn says, he wishes "to suggest how…the traits of a specific animal is assumed by the imagination of different cultures in different ways."[23] Munn's arguments at times echo concepts of convergent versus divergent evolution in biology, leaning into the idea that the development of specific iconographies can be analogized with speciation.[24] This, in turn, links Munn's work to modern cultural evolution theory.[25]

Meanwhile, Alfredo López Austin's *The Myths of the Opossum: Pathways of Mesoamerican Mythology* recruits the opossum to be "[our] guide in the home of the gods," using its myth cycle to investigate the survival and resilience of Mesoamerican tradition.[26] Austin identifies as the most important of these myths, "widespread and rich in its variants," as the casting of the opossum "as a kind of New World Prometheus" who steals fire from its otherworldly keepers and gifts it to humans.[27] Austin also articulates an interest in the intrinsic

[22] Henry Munn, "The Opossum in Mesoamerican Mythology," *Journal of Latin American Lore* 10, no. 1 (1984): 25.

[23] Munn, "The Opossum in Mesoamerican Mythology," 25.

[24] In biology, divergent evolution is when species from a common ancestral lineage develop distinct characteristics over time due to different selection pressures, while convergent evolution is when species from different ancestral lineages develop similar characteristics over time due to similar selection pressures.

[25] Cultural evolutionary theorists argue that many processes of cultural change share fundamental similarities to processes of biological change, and thus cultural evolution can be studied with some of the same basic scientific concepts and methods which have been developed in the field of biological evolution.

[26] Alfredo López Austin, *The Myths of the Opossum: Pathways of Mesoamerican Mythology*, translated by Thelma and Bernard Ortiz de Montellano (Albuquerque: University of New Mexico Press, 2011), 9.

[27] Austin, *The Myths of the Opossum*, 7.

connections between the study of mythology and iconography, and asserts that reconstructing mythological order and interpreting iconography can be investigated in tandem as "a reciprocal process of elucidation."[28] Austin's monograph is both more recent and more comprehensive than Munn's article, though he does cite Munn multiple times in his expanded investigation of the opossum's Mesoamerican legacy. Austin also provides valuable insights into how pre-conquest Mesoamerican narratives were transformed by the influx of Christian ones, which are especially relevant to the early colonial images identified in this study.

Carolyn Baus Czitrom's "Significance of the Opossum in the Mesoamerica World" also documents the opossum's place in Mesoamerican myth, cosmology, traditional medicine, and contemporary ethnography, but it is more focused on iconography than Munn and Austin's broader cultural histories.[29] Czitrom's paper includes chronological tables documenting 50 works from the Preclassic (2000 BCE-250 CE), Classic (250-900 CE), and Postclassic (900-1521 CE) periods identified as opossums, primarily from the collection of Mexico City's Museo Nacional de Antropologia (MNA). Czitrom divides these into two broad categories: Group I, the "realistic" images, and Group II, the "deity" images. Czitrom observes that the opossum developed multiple symbolic meanings across time and cultures and suggests that this was specifically because of its suite of distinct biological characteristics.

[28] Austin, 2.

[29] Carolyn Baus Czitrom, "Significance of the Opossum in the Mesoamerica World," in *The Symbolism in the Plastic and Pictorial Representations of Ancient Mexico: A Symposium of the 46th International Congress of Americanists, Amsterdam 1988*, ed. Jacqueline de Durand-Forest and Marc Eisinger (Bonn: Holos, 1993), 319-338.

Opossum Iconography Across Visual Media[30]

Mesoamerican depictions of opossums are encountered in two main forms: as book illustrations (in codices), and three-dimensional objects either as standalone figures or iconographic elements (ceramics, sculpture, etc.). Karl Taube's "Ritual Humor in Classic Maya Religion" includes an extended discussion of opossums in both forms of media as entertainers associated with Maya God N, such as the four Opossum Mams found in the *Dresden Codex* (Fig. 4a).[31] Agnieszka Brylak also considers the opossum's entertainer iconography, specifically as it relates to associations with sexuality and fertility, further identifying it as one of the animal aspects of the Aztec deity Techalotl as well as highlighting its appearance in the Aztec *Codex Borbonicus* as part of a festival parade of "lustful animal" actors (Fig. 4b).[32]

Mesoamerican Codices

There is a dedicated body of scholarship focused on decoding the Mesoamerican Maya, Aztec, and Mixtec codices, which reveal that opossum imagery is present in multiple manuscripts from all three cultures, both in glyph and figural form (see Fig. 5 for a full list). Works by Eduard Seler, W. Stempell, and Alfred Tozzer and Glover Allen focus on the animal

[30] In addition to the opossum iconography covered here, it should be noted that some scholars have suggested that the Yapok, aka the Water Opossum (*Chironectes minimus*) (illustrated in Fig. 16) is one of the primary inspirations for the Aztec cryptid creature known as Ahuitzotl. The similarities are especially noticeable in the Ahuitzotl glyph of the Aztec ruler of the same name (r. 1486-1502), found in visual media dating from the late fifteenth into the post-conquest sixteenth centuries. However, since the merits of this theory would require its own separate detailed analysis to properly elucidate, this iconography will not be included here. See Henry B. Nicholson and Eloise Quiñones Keber, *Art of Aztec Mexico: Treasures of Tenochtitlan* (Washington, D.C.: National Gallery of Art, 1983), 52, 120, which refers to an unpublished manuscript by J. Eric S. Thompson ["Myth, Metaphor and Other Factors in Maya Representations of Fauna with Special Reference to the Water Opossum"] in support of this identification; Matthew McDavitt, "Water-dog Detective," Mexicolore, April 6, 2010, https://www.mexicolore.co.uk/aztecs/aztefacts/water-dog-detective, and Yuri Escalante Betancourt, "El *Ahuítzotl*. Animal Asesino del Agua," *Arqueología Mexicana* VI, no. 35 (Enro-Febrero 1999): 57-61, who also presents the Nutria (*Myocastor coypus*) and a mythologized "water dog" as other likely components.

[31] Karl Taube, "Ritual Humor in Classic Maya Religion," in *Studies in Ancient Mesoamerican Art and Architecture: Selected Works by Karl Andreas Taube* (San Francisco: Precolumbia Mesoweb Press, 2018), 118-149.

[32] Agnieszka Brylak, "Truhanería y Sexualidad: Techalotl Entre los Nahuas Prehispánicos," *Itinerarios: Revista de Estudios Lingüisticos, Literarios, Históricos y Antropológicos* 21 (2015): 57-78.

iconography within these manuscripts, and each include opossum identifications.[33] Scholarship by Gabrielle Vail and Christine Hernandez focused on the pre-conquest Maya codices also provides identifications and interpretations of opossum iconography in those books.[34] Other studies focused on specific codices offer further insight into the multiple symbolic meanings opossums took on in these works.[35]

Mesoamerican Ceramics, Sculpture, Etc.

Scholarship on opossum imagery in other media is scattered across a wide array of sources pertaining to archeological site inventories and/or regional iconography. A number of scholars have noted the prevalence of opossum iconography at various archeological sites in Mexico dating as far back as the Formative/Preclassic (2000 BCE-250 CE) up until the time of conquest. In some cases, there is a high degree of localization noted for this iconography. For example, Michael D. Lind's quantitative analysis of polychrome pottery found that while 50% of Cholula Catalina Polychrome tripod vessels had opossum head supports, none of the Oaxaca Pilitas Polychrome ones did.[36] Similarly, Rachael Wedemeyer's study of figurines found at Cerro

[33] Eduard Seler, "The Animal Pictures of the Mexican and Maya Manuscripts," in *Collected Works in Mesoamerican Linguistics and Archaeology*, Vol. V, ed. Frank Comparato (Culver City: Labyrinthos, 1996), 165–340; W. Stempell, "Die Tierbilder der Mayahandschriften," *Zeitschrift für Ethnologie* 40, no. H. 5 (1908): 704-743; Alfred Tozzer and Glover Allen, *Animal Figures in the Maya Codices* (Cambridge: Harvard University, 1910).

[34] Gabrielle Vail and Christine Hernández, *Re-creating Primordial Time: Foundation Rituals and Mythology in the Postclassic Maya Codices* (Boulder: University Press of Colorado, 2013), and *The Maya Codices Database*, Version 5.0, 2018, http://www.mayacodices.org/.

[35] See for example Jill Leslie McKeever, *Codex Vindobonensis Mexicanus I: A Commentary* (Albany: Institute for Mesoamerican Studies, SUNY Albany, 1978), and Robert Lloyd Williams, *Lord Eight Wind of Suchixtlan and the Heroes of Ancient Oaxaca: Reading History in the Codex Zouche-Nuttall* (Austin: University of Texas Press, 2009), who both identify opossums as participants in pulque ceremonies as a companion of the maguey goddess; and Christopher L. Moser, "Human Decapitation in Ancient Mesoamerica," *Studies in Pre-Columbian Art and Archaeology* 11 (1973): 28-31, who highlights a pictorial sequence in the Aztec *Codex Fejérváry-Mayer* depicting an opossum deity decapitating a human opponent in ritual combat.

[36] Michael D. Lind, "Cholula and Mixteca Polychromes: Two Mixteca-Puebla Regional Sub-styles," in *Mixteca-Puebla: Discoveries and Research in Mesoamerican Art and Archaeology*, ed. H. B. Nicholson and E. Quinones-Keber (Culver City: Labyrinthos, 1994), 92.

de la Virgen and Río Viejo found that opossums were common at the first site, but completely absent at the second site; as these sites were in close enough proximity to each other to share a similar faunal profile, Wedemeyer suggests the opossum (and a handful of other zoomorphs unique to only one site) may have been a local community icon or town banner.[37] A number of scholars further observe that at some sites the highest densities of opossum figures were found in domestic contexts, and connect these to fire, fertility, and curing rituals (e.g., Fig. 6a).[38]

Opossum imagery has also been identified in a variety of mortuary goods recovered from archeological excavations; scholarship by Proyecto Tlatelolco's director Salvador Guilliem Arroyo serves as the primary documentation of one of the most well-known examples, identified as a rattle in the form of a mother and child opossum (Fig. 6b).[39] Still other scholars have linked specific ceramics featuring opossum iconography with Maya God N and God D.[40] Lastly, classic works by Frank Boos and Alfanso Caso and Ignacio Bernal documenting Zapotec urns are

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[37] Rachel Wedemeyer, *Fragments of Identity: A Study of Ceramic Figurines from the Terminal Formative Period in the Lower Río Verde Valley, Oaxaca, Mexico* (Undergraduate Honors Thesis, University of Colorado Boulder, 2018), 194-5, 205.

[38] See David M. Carballo, *Urbanization and Religion in Ancient Central Mexico* (Oxford: Oxford University Press, 2016); Jamie E. Forde, "The Polychrome Ceramics of Tututepec (Yucu Dzaa), Oaxaca, Mexico: Iconography and Ideology," *Ancient Mesoamerica* 27, no. 2 (2016): 389-404; Jan Olson, "A Socioeconomic Interpretation of Figurine Assemblages from Late Postclassic Morelos, Mexico," in *Commoner Ritual and Ideology in Ancient Mesoamerica*, ed. N. Gonlin and J. C. Lohse (Boulder: University Press of Colorado, 2007), 251-79; Michael E. Smith, "Domestic Ritual at Aztec Provincial Sites in Morelos," in *Domestic Ritual in Ancient Mesoamerica*, ed. P. Plunket (LA: UCLA, 2004), 93-114; Rebecca Storey, Gina M. Buckley, and Douglas J. Kennett, "A Glimpse of the People of Altica: Osteological and Isotopic/Radiocarbon Analysis," *Ancient Mesoamerica* 30, no. 2 (2019): 355-368.

[39] Salvador Guilliem Arroyo, "Figurillas de Tlatelolco," *Arqueología* 17 (1997): 126-7; additional details in Leonardo López Luján and Salvador Guilliem Arroyo, "Mexica Textiles: Archaeological Remains from the Sacred Precincts of Tenochtitlan and Tlatelolco," in *PreColumbian Textile Conference VII / Jornadas de Textiles PreColombinos VII*, ed. Lena Bjerregaard and Ann Peters (Lincoln, NE: Zea Books, 2017), 144-9.

[40] Erik Boot, "At the Court of Itzam Nah Yax Kokaj Mut: Preliminary Iconographic and Epigraphic Analysis of a Late Classic Vessel," Maya Vase Database, 2008, http://www.mayavase.com/God-D-Court-Vessel.pdf; Susan Milbrath, Carlos Peraza Lope, and James John Aimers, "Mayapan's Chen Mul Modeled Effigy Censers: Iconography and Archaeological Context," *Ancient Maya Pottery: Classification, Analysis, and Interpretation*, ed. James John Aimers (Gainesville: University Press of Florida, 2013), 203-228; Elizabeth H. Paris, Eric Taladoire, and Thomas A. Lee Whiting, "Return to Moxviquil: Form and Function in a Small Maya City," *Ancient Mesoamerica* 26, no. 1 (2015): 81-112.

valuable for dedicating entire chapters to the "Opossum God" of Oaxaca (Figs. 6c, 6d), whose distinctive regional iconography includes both idiosyncratic elements and ones which can be directly linked to both earlier and later cultures.[41]

Andean Art

With the exception of those from the Manteño-Huancavilca culture, which was still extant at the time of the Spanish Conquest, most of the identified Andean works are from earlier cultures which predate the scope of the present study. Nevertheless, the regional scholarship provides a useful model for pursuing a more comprehensive and zoologically-informed analysis of other Indigenous American visual records. Andean opossum iconography has been primarily documented in the cultures of coastal Ecuador, within scholarship dedicated to properly identifying and classifying the region's zoomorphic iconography. This scholarship is also noteworthy for regularly including the scientific names of animal taxa as part of this cataloging.

Andrés Gutiérrez Usillos' comprehensive catalog of pre-conquest Ecuadorian zoomorphic iconography stands out amongst these works and includes extended discussion about the prevalence and meaning of opossum iconography.[42] Remarking that opossums are "often unjustly forgotten or displaced by the importance conferred on the feline," Usillos offers a list of diagnostic features to identify images as likely opossums, and expresses amazement that this iconography is not only repeated over and over again in the Ecuadorian region, but exhibits

[41] F. H. Boos, *The Ceramic Sculptures of Ancient Oaxaca* (New York: A. S. Barnes & Co., 1966); Alfonso Caso and Ignacio Bernal, *Urnas de Oaxaca* (Durango: Instituto Nacional de Antropología e Historia, 1952).

[42] Andrés Gutiérrez Usillos, *Dioses, Símbolos y Alimentación en los Andes: Interrelación Hombre-Fauna en el Ecuador Prehispánico* (Quito: Editorial Abya Yala, 2002).

"extraordinary diffusion…from Mesoamerica to Peru."[43] Like previously discussed Mesoamerican scholars, Usillos credits the opossum's unique suite of morphological and behavioral characteristics as having inspired its diversity of symbolic meanings. Usillos further addresses the regional overlap in opossum and coati iconography, both in terms of image (e.g., the paws-to-snout gesture) and symbolism (e.g., agricultural fertility). Usillos observes that opossums are amongst the most frequently depicted zoomorphs in Manteño-Huancavilca ceramics, found on bottles, figurines, stamps, and ladle censers (Fig. 7a).

Maria Ugalde's monograph on Tolita iconography includes a quantitative analysis of the relative distribution of zoomorphic characters, which reveals that opossums are the third most frequently represented animals behind felines and crocodilians.[44] Ugalde cites Usillos' previous work and seconds his observation that opossums were not only one of the most commonly represented characters in Tolita iconography, but also one of the most versatile, depicted in a variety of different activities in both naturalistic and anthropomorphized forms. Once again, Ugalde suggests that "it is surely to [its] very particular characteristics that the opossum owes its leading role in the iconography and mythology of American cultures."[45] While the Tolita culture

[43] Usillos, *Dioses, Símbolos y Alimentación en los Andes*, "la zarigueya un animal muchas veces injustamente olvidado, o desplazado por la importancia conferida al felino," 302, and "Otro rasgo sorprendente de esta iconografia tan poco considerado por los investigadores, es la de su extraordinaria difusión. Encontramos repetido el mismo esquema descrito, desde Mesoamérica hasta el Perú," 584 (English translations used in text are my own). Usillos even suggests that the opossum was one of the original inspirations for the "Moon Animal," a mythological creature with a composite zoomorphic form best known from Moche art, but which likely had origins dating back to the Chavín; this theory is discussed and supported in María Fernanda Ugalde, "Difusión en el Periodo de Desarrollo Regional: Algunos Aspectos de la Iconografía Tumaco-Tolita," *Bulletin de l'Institut Français d'Etudes Andines* 35, no. 3 (2006): 399-401.

[44] María Fernanda Ugalde, *Iconografía de la Cultura Tolita: Lecturas del Discurso Ideológico en las Representaciones Figurativas del Desarrollo Regional* (Bonn: Deutschen Archäologischen Instituts / Reichert Verlag Wiesbaden, 2009); data chart on page 79.

[45] Ugalde, *Iconografía de la Cultura Tolita*, "A estas características tan particulares seguramente les debe la zarigüeya su rol protagónico en la iconografía y la mitología de varias culturas americanas," 85 (English translation used in text is my own).

falls outside this study's temporal scope, Ugalde also briefly covers the continuation of this iconography into the later Manteño-Huancavilca culture, reporting on the prevalence of opossum imagery on their seals, whistles, vessels, and ladle handles (Fig. 7a).[46]

Two other scholars merit attention here. The first is Elka Weinstein, whose study of Chorrera ceramics identifies opossums amongst the assemblage of zoomorphic characters.[47] Weinstein notes that these ceramics were likely all mortuary goods, although some may have also had ritual function before being interred, and connects these to what is known about the opossum's connections to fertility cults and their past and present symbolic associations with life, death, and rebirth. The second is Johannes Wilbert, who cataloged thousands of Guangala and Manteño-Huancavilca spindle whorls with zoomorphic designs, with the opossum identified as one of the most frequently depicted animals (Fig. 7b).[48] Wilbert says these spindle whorls were likely associated with a "cult of fertility," and that "ambiguous" animals and those with dualistic life/death symbolism were favored subjects.[49] Wilbert dedicates a section to opossum iconography and proceeds to relate how "the peculiar characteristics and habits of this unique New World marsupial" could easily inspire associations with fertility, ambiguity, and duality.[50] Wilbert also observes that some opossums were depicted upside down, perhaps to symbolize

[46] Ugalde, 86-7.

[47] Elka Weinstein, "The Serpent's Children: The Iconography of the Late Formative Ceramics of Coastal Ecuador" (PhD diss., University of Toronto, 1999).

[48] Johannes Wilbert, *The Thread of Life: Symbolism of Miniature Art from Ecuador* (Washington, D.C.: Dumbarton Oaks, Trustees for Harvard University, 1974); opossums, 82-5.

[49] Wilbert, *The Thread of Life*, 31-2.

[50] Wilbert, 82-5.

their behavior of "playing dead," and some appear to represent the Yapok, aka Water Opossum, which has a distinctive black and grey/white banded pelage and webbed feet (see Fig. 2).[51]

Weinstein and Wilbert both draw upon ethnographic analogy to make their interpretations, and each provides a defense of its methodological validity. Wilbert asserts "the validity of interpretation by analogy with New World cultures finds support in an increasing body of evidence for pre-Hispanic contact and even a common archaic substratum between the Andes and Mesoamerica," while Weinstein similarly cites "continuities in cosmology and symbolism which are apparent in the archeological record through time throughout the region."[52] These two studies thus show how, when practiced judiciously, ethnographic analogy can be used to help elucidate meaning in zoomorphic iconography.

Early Colonial Art

In addition to opossums found in pre-conquest Indigenous American art, there are at least three cases of opossums which appear in sixteenth-century early colonial projects illustrated by Nahua artists who were under the direction of Spanish missionaries, making these rare examples of "hybrid" opossum art from the period. The first two can be found in mural cycles at the Augustinian monastery in Malinalco (Fig. 8) and the Casa del Deán ("the home of the dean," the urban residential palace of the dean of the cathedral) in Puebla (Fig. 9), both in Mexico. A monograph by Jeanette Favrot Peterson provides a detailed account of the Malinalco project's history and iconography, including identifications of many of the biota depicted in what are

[51] Wilbert also claims one of the spindle whorls represents a mother opossum with a baby on its back (p. 84, Fig. 108); however, the rendering of the long trunk-like nose suggests it was more likely to represent one of the four native species of Anteaters (*Myrmecophaga*, *Tamandua*, and *Cyclopes* spp.), all of whom carry a single offspring on their backs.

[52] Wilbert, 10; Weinstein, "The Serpent's Children," ii.

called the "paradise garden" frescoes found in the lower cloister.[53] Likewise, Penny C. Morrill's monograph is dedicated to the two surviving mural cycles found in the Casa del Deán, and includes a section focused on identification of the animal figures in the *Salon of the Triumphs*.[54] Both authors attempt to make opossum identifications, although as discussed in the analysis, their choices are debatable.

The third case is *La Historia General de las Cosas de Nueva España* (*The Universal History of the Things of New Spain*), also known as the *Florentine Codex* (c. 1540/1585). This expansive twelve-volume collection was the culmination of a decades-long research project by Spanish Franciscan friar Bernardino de Sahagún (1499-1590), who, through a collaboration with his Nahua students at the Colegio de Santa Cruz de Tlatelolco, sought to produce a comprehensive Aztec cultural encyclopedia. In addition to the dual Nahuatl and Spanish text, there are over 2000 images illustrated by the Indigenous artists. While there is no scholarship specific to the male and female *tlaquatl* (opossum) found in Book 11 (*Earthly Things*, primarily a catalog of native fauna and flora) (Figs. 10a, 10b), there is a modern English language translation by Charles Dibble and J. O. Anderson (the first complete translation into any language) which includes full color reproductions of these two illustrations, along with supplementary texts detailing the general history of this unique project.[55]

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[53] Jeanette Favrot Peterson, *The Paradise Garden Murals of Malinalco: Utopia and Empire in Sixteenth-century Mexico* (Austin: University of Texas Press, 1993); animals in Chapter 5.

[54] Penny C Morrill, *The Casa del Deán: New World Imagery in a Sixteenth-century Mexican Mural Cycle* (Austin: University of Texas Press, 2014); animals in Chapter 7.

[55] Charles Dibble and J. O. Anderson, *Florentine Codex. Book 11: Earthly Things* (Salt Lake City: The University of Utah Press, 1981), 11-12, ill. 20, 21. Secondary sources include Diana Magaloni Kerpel, *The Colors of the New World: Artists, Materials, and the Creation of the Florentine Codex* (Los Angeles, Getty Publications, 2014); Jeanette Favrot Peterson and Kevin Trerraciano, eds., *The Florentine Codex: An Encyclopedia of the Nahua World in Sixteenth-century Mexico* (Austin: University of Texas Press, 2019); and Gerhard Wolf, Joseph Connors, and Louis Alexander Waldman, eds., *Colors Between Two Worlds: the Florentine Codex of Bernardino de Sahagún* (Florence: Kunsthistorisches Institut in Florenz, Max-Planck-Institut, 2011).

European Visual Records

General Observations and Known Iconographic Studies

Scholarship on the European visual record of opossums is more prolific than its counterpart, with a number of issues across science, culture, and art considered. It is also here that we find the only published studies solely dedicated to historical opossum iconography. Eastman's "Early Portrayals of the Opossum," while over a century old, is still a valuable source for visual records and historiographic context, and as previously mentioned, even briefly touches upon Indigenous iconography. Susan Scott Parrish's "The Female Opossum and the Nature of the New World" is a modern study unique in its methodological approach, applying a feminist lens to investigate how opossum iconography was connected to a larger European campaign of gendering nature and promoting maternal ideals.[56] Parrish also makes the astute observation that even though "both sexes possessed anatomical attributes that might have suggested a range of mythical constructs," that "it was almost exclusively the female and, in particular, her organs of generation and gestation" that early modern scientists focused on.[57]

Origin and Dissemination of the First European Image and Other Early Oddities

Beyond the above pair of focused studies, one must comb through general works on early modern European natural, cultural, and artistic history to find additional considerations of opossum visual records. By far the most commonly encountered topic is that of the earliest depictions by Europeans following reports of the first encounters with the previously unknown

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[56] Susan Scott Parrish, "The Female Opossum and the Nature of the New World," *The William and Mary Quarterly* 54, no. 3 (1997): 475-514. Parrish also discusses the opossum in her book *American Curiosity: Cultures of Natural History in the Colonial British Atlantic World* (Raleigh: UNC Press Books, 2012), with additional insights on how opossum depictions evolved in tandem with the scientific evolution of natural history such as "the Enlightenment reconstruction of the opossum, the American animal that for Renaissance writers had typified the New World's powers for wonderful monstrosity, exemplifies this shift in the late seventeenth century from an irruptive to an orderly natural world and this shift's reorientation of American nature in particular," 54-5.

[57] Parrish, "The Female Opossum and the Nature of the New World," 475.

creature.[58] Of special interest is the oldest known surviving image, which was in the form of a 1516 map icon (Fig. 11a). Later dubbed a "*Simivulpa*" (Latin for "ape-fox"), it is a key image in the opossum's iconographic history; it not only continued to serve as a "New World" icon on later maps but was also copied widely in zoological texts, emblem books, and other print media of the period, even making its way onto the ceiling of a Scottish castle (Fig. 15a). Scholarship by Gaetano Ferro et al., Wilma George, and Chet Van Duzer consider this image's place in the history of cartography as a map icon, while a number of other works reference it as part of the discussion on the creation and dissemination of the earliest European images of American animals.[59] This larger body of scholarship addresses various aspects of how this early visual record reflects European accumulation and transmission of knowledge about novel animals during their initial exploration and subsequent colonization of the Americas, including the role this influx of new information and species played in the development of early modern zoology.[60] These sources collectively demonstrate applying a methodological combination of iconography

[58] In addition to the *Simivulpa* discussed in this section, some sources suggest that a second creature known as the *Su* may have also been based in part on a wildly inaccurate description of an opossum. However, the main connection made to the opossum is the carrying of the babies on its back, and this trait is also common to other creatures far more likely to have been inspirations for this cryptid, such as the Giant Anteater (*Myrmecophaga tridactyla*) or some now-extinct species of Ground Sloth (Folivora). As I agree with those who suggest such animals as more likely inspirations for the *Su*, its image will not be covered in this study.

[59] Gaetano Ferro, Luisa Faldini, Marica Milanesi, and Gianni Eugenio Viola, *Columbian Iconography*, trans. Luciano F. Farina and Carla Onorato Wysokinski (Rome: Istituto Poligrafico e Zecca Dello Stato, Libreria dello Stato, 1996), 546-7; Wilma George, *Animals and Maps* (Berkeley: University of California Press, 1969), 23, 61-3, 68, 70, 74, 77-8, 83-5, 94, 98, 184-5, 187, 190, 195, 204, 206, 209; Wilma George, "Sources and Background to Discoveries of New Animals in the Sixteenth and Seventeenth Centuries," *History of Science* 18, no. 2 (1980): 80-8; Chet Van Duzer, *Martin Windemuller's' Carta marina' of 1516: Study and Transcription of the Long Legends* (Cham: Springer Nature, 2020), 22-3 and 91-6.

[60] In addition to the two sources cited in the next paragraph, I have identified several sources which cover this general topic, though each only contains a short consideration of opossum images embedded in the larger discussion. These sources include: Ernesto Capanna, "South American Mammal Diversity and Hernandez's Novae Hispaniae Thesaurus," *Rendiconti Lincei* 20 (2009): 39–60; Charles R. Eastman, "Beginnings of American Natural History," *The American Museum Journal* 15 (1915): 349-355; Hugh Honour, *The New Golden Land: European Images of America from the Discoveries to the Present Time* (New York: Pantheon Books, 1975), 40; and Urs B. Leu, "Konrad Gessner und die Neue Welt," *Gesnerus* 49, no. 3-4 (1992): 279-309.

and visual cultural studies, with some also touching upon postcolonial perspectives. Their discussion also tends to intersect with the history of science, allowing for at least some degree of scientific methodology to enter into the conversation.

A common theme in this scholarship is how observers struggled to describe a previously unknown form of animal, and how image makers in turn produced strange and inaccurate illustrations based on these accounts. Miguel De Asúa and Roger French's *A New World of Animals: Early Modern Europeans on the Creatures of Iberian America* (which also features Nieremberg's opossum on the cover; see Fig. 13c) identifies the first European written description of an opossum as one of the earliest cases of the "jigsaw animal" method of describing American fauna, which involved describing previously unknown animals by comparing various parts of their appearance to familiar animals.[61] Asúa and French also discuss how subsequent interpretation into image of such jigsaw animal descriptions could result in hybrid or chimera-like creatures barely recognizable as their real-life counterparts. Enenkel's "The Species and Beyond: Classification and the Place of Hybrids in Early Modern Zoology" explores this phenomenon in more depth from the perspective of the history of zoology and cites examples of opossum illustrations in seventeenth century natural history texts.[62]

Additional sources also include information about the creation and dissemination of early European opossum depictions, but with an emphasis on their adoption as emblems. For example, William Ashworth, a noted scholar of what he terms "emblematic natural history," discusses the opossum as an example of how "new" animals without any Classical sources to draw upon were

[61] Miguel De Asúa and Roger French, *A New World of Animals: Early Modern Europeans on the Creatures of Iberian America* (London and New York: Routledge, 2017), 13-14.

[62] Karl AE Enenkel, "The Species and Beyond: Classification and the Place of Hybrids in Early Modern Zoology," in *Zoology in Early Modern Culture: Intersections of Science, Theology, Philology, and Political and Religious Education*, ed. Karl AE Enenkel and Paul J. Smith (Leiden: Brill, 2014), 101, 136.

integrated into existing emblematic systems.[63] Victoria Dickenson and Karl Enenkel have also both considered the use of opossums as emblematic animals, especially as part of New World othering propaganda.[64] Meanwhile, Louise Rice's "Villamena's Kangaroo" is an iconographic case study which focuses on a 1602 emblem sometimes identified as a kangaroo (Fig. 12a) – a date which precedes when Europeans are known to have first traveled to Australia – and argues that rather than evidence for an earlier encounter, it is likely just another misinterpretation of a female opossum connected to earlier sixteenth century depictions (Figs. 12b, 12c).[65] This vein of analysis is understandably more art historical in its methodological focus.

In Situ European Images of Opossums

Eventually, more realistic images based on first-hand *in situ* observation – and incorporation of Indigenous knowledge and names – began to appear. Similar to the previously noted works which consider early modern European images, scholarship on these images studies the iconography of these images through a visual culture studies lens, additionally informed by an even greater degree of postcolonial perspective. As these works are generally recognized as scientific in nature, they also include some natural history perspectives and quantitative analysis.

There are several such original images (along with their subsequent iterations) which are of interest to the present study, though most have only been investigated by one or two scholars in the literature. Fernández de Oviedo's (1478-1557) unpublished sketch of a Caribbean *Churcha*

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[63] William Ashworth, "Emblematic Natural History of the Renaissance," in *Cultures of Natural History*, ed. N. Nardine, J.A. Secord, and E.C. Spary (Cambridge: Cambridge University Press, 1996), 17-37, and "The Revolution in Natural History: Natural History and the Emblematic World View," in *The Scientific Revolution: The Essential Readings*, ed. Marcus Hellyer (Malden: Blackwell Publishing, 2003), 130-156.

[64] Victoria Dickenson, "Emblematic Animals," in *Drawn from Life: Science and Art in the Portrayal of the New World* (Toronto: University of Toronto Press, 1998), 19-44; Karl AE Enenkel, "Camerarius's Quadrupeds (1595): A Plinius Emblematicus as a Mirror of Princes," in *Emblems and the Natural World*, ed. Karl AE Enenkel and Paul J. Smith (Leiden: Brill, 2017), 132-9. Enenkel's book also features an early opossum image derived from the original map icon on the cover.

[65] Rice, "Villamena's Kangaroo."

(Fig. 13a) is documented in Daymond Turner's investigation of the "forgotten treasure" of Oviedo's original images.[66] Hans Staden's (1525-1576) Brazilian *Serwoy* illustration (Fig. 13b) is briefly covered by both Eastman and Hartman. Juan Eusebio Nieremberg's (1595-1658) extraordinary *Tlaquatzin* woodcut from either Mexico or Central America (Fig. 13c) is highlighted by José Ramón Marcaida as one of forty "object-images of knowledge" in the recent *New World Objects of Knowledge: A Cabinet of Curiosities*.[67] Information on the Brazilian *Taibi / Carigueya* and *Aguaja* illustrations usually attributed to Georg Marcgrave (1610-1644) and Albert Eckhout (1610-1665) (Figs. 13d, f, g) can be found in the small body of literature dedicated to the seventeenth-century zoological illustrations from the Dutch Brazil court and works featuring iterations of these images (e.g., the *Opassum* in Fig. 13e, the earliest found image labeled with the now-standard English common name derived from Powhatan).[68] A 2011 paper by Theodore W. Pietsch reports on a previously unpublished illustration of a *Manicou* by Charles Plumier (1646-1704), a French friar who recorded extensive observations of the fauna and flora of the Caribbean during three trips to the region (Fig. 13h).[69] Pietsch's focus is on

[66] Daymond Turner, "Forgotten Treasure from the Indies: The Illustrations and Drawings of Fernández de Oviedo." *The Huntington Library Quarterly* (1985): 1-46; opossum, 33-4.

[67] José Ramón Marcaida, "Opossum," in *New World Objects of Knowledge: A Cabinet of Curiosities*, ed. Mark Thurner and Juan Pimentel (University of London Press, 2021), 183–86.

[68] See M. Boeseman, L.B. Hultquist, M.S. Hoogmoed, and C. Smeenk, "Seventeenth Century Drawings of Brazilian Animals in Leningrad"; Rebecca P. Brienen, "From Brazil to Europe: The Zoological Drawings of Albert Eckhout and Georg Marcgraf," in *Early Modern Zoology: The Construction of Animals in Science, Literature and the Visual Arts*, eds. Karl AE Enenkel and Paul J. Smith (Leiden: Brill, 2007), 273-314; Cristina Ferrão and José Paulo Monteiro Soares, *Brasil-Holandês / Dutch-Brazil*, 5 vols. (Rio de Janeiro: Editora Index, 1995); Cláudia Philippi Scharf, "Libri Principis e as Ilustrações de Fauna do Brasil Holandês: Fatura, Técnicas, Materiais e Autores" (PhD diss., Universidade Federal da Bahia, 2019); Peter Whitehead and Marinus Boeseman, *A Portrait of Dutch 17th Century Brazil: Animals, Plants, and People by the Artists of Johan Maurits of Nassau* (Amsterdam: North-Holland Publishing Company, 1989).

[69] Theodore W. Pietsch, "Charles Plumier's 'Manicou Caraibarum' (c. 1690): A Previously Unpublished Description and Drawing of the Common Opossum, *Didelphis marsupialis* Linnaeus, 1758," *Archives of Natural History* 38, no. 1 (2011): 77-87.

"emphasi[zing] the originality and scientific accuracy of Plumier's account," making this a useful example of fully integrating a scientific lens into an art historical analysis.[70]

Lastly, Maria Sibylla Merian's (1647-1717) "Rat de Forest" (also known as Merian's Opossum) (Fig. 13i) from Suriname is given its own chapter by Hartman, who analyzes its charming but inaccurate depiction of the how young were carried and traces how subsequent zoological texts would nonetheless copy Merian's composition and present it as fact even into the twentieth century (see Fig. 16a for a nineteenth century example, and Fig. 14b for its insertion into the Seba plates). Sleigh's *Paper Zoo* also presents Merian's image, offering a feminist reading of its symbolism by suggesting that "traveling alone with her daughter in South America, perhaps she found the image comforting or even a proud emblem of self-sufficiency."[71] Reitsma and Ulenberg report this plate was one of a dozen found in Merian's studio after her death and inserted into the posthumous 1719 edition of *Metamorphosis insectorum Surinamensium*, and suggest that her daughter Johanna may have had a hand in its composition.[72]

Ex Situ **Opossum Specimen Illustrations**

Tyson's Dissection Images

Parrish highlights Edward Tyson's (1651-1708) scientific illustrations of a dissected female and male Virginia Opossum for the Royal Society of London, presented in 1698 and 1704 respectively – the first of their kind ever published (Fig. 14a).[73] Parrish thus presents these images as the opossum's official inauguration into the "new science" of the Enlightenment. Parrish also points out this was one of the few times when the male opossum's unique anatomy

[70] Pietsch, "Charles Plumier's 'Manicou Caraibarum,'" abstract.

[71] Sleigh, *The Paper Zoo*, 60.

[72] Reitsma and Ulenberg, *Maria Sibylla Merian & Daughters*, 240.

[73] Parrish, "The Female Opossum and the Nature of the New World."

received any significant attention from the European chroniclers, and perhaps the first time it was explicitly represented in European visual media – and even here, its publication was treated essentially as an epilogue to the significantly more detailed account of the female's anatomy.

Seba's Opossums

One of the most studied works of illustrated natural history is the massive *Locupletissimi rerum naturalium thesauri accurata descriptio, et iconibus artificiosissimis expressio, per universam physices historiam* (*Accurate Description of the Wealthiest Treasure of Things*), aka simply the *Thesaurus*. It was commissioned to catalog the famous natural history cabinet of Dutch apothecary Albertus Seba (1665-1736) and published in four large folio volumes between 1736-1765 (the last two posthumously), with some copies later hand colored. There is a robust body of scholarship on this work which straddles both natural history and art history, as this pictorial inventory continues to hold both scientific and artistic value into the present day.[74]

Included amongst the 449 plates (created by a workshop of over a dozen artists) are four featuring illustrations both male and female and adult and juvenile opossum specimens of multiple species (Fig. 14b), some of which would be lifted for use in other print media well into the nineteenth century (Fig. 16a). As such, this one work is a singularly important source for studying the visual record. There has also been an ongoing taxonomic debate in the scientific

[74] An invaluable resource is Müsch, Rust, and Willmann's *Cabinet of Natural Curiosities: Locupletissimi Rerum Naturalium Thesauri 1734-1765: Based on the Copy in the Koninklijke Bibliotheek, The Hague* (Cologne: Taschen, 2011); this modern reproduction of The Hague's original hand-colored copy includes extensive notes and additional scholarly essays which inform both scientific and artistic reading of these images.

literature about the identification of Plate 39 and its status as a type specimen.[75] Following this continuing scholarly exchange provides a valuable lesson in how scientific methodology can be applied to the reading of historical opossum images.

What About Non-Print Media?

In sharp contrast to the prevalence of hand-crafted works in the Indigenous American visual record, an exhaustive search through the European (and postcolonial American) visual record has found the opossum to be almost entirely absent outside of print media prior to the early twentieth century. Thus far only a handful of examples have been found, all but one of which are clearly lifted from an earlier natural history print illustration. Apart from the handful of works noted below, opossums appear to be missing as identified subjects in early modern European non-print media. Odder still is the fact that only one of these examples may be an original image based on observation of real animals, even though there is evidence that live opossums did eventually make their way to Europe for public exhibition and sale, and of course, there were Europeans settling in the Americas and creating art there as well.[76]

The derived images include the previously mentioned opossum emblem on the ceiling of the Long Gallery in Earlshall Castle, located in Fife, Scotland, documented by Michael Bath in

[75] "Type specimens" are officially designated taxonomic references; see the International Code of Zoological Nomenclature (https://code.iczn.org/) for more information. For the controversy over the identification and status of Plate 39, see Cayo Augusto Rocha Dias, Guilherme Siniciato Terra Garbino, and Fernando Araújo Perini, "On the Identity of *Didelphis marsupialis* Linnaeus 1758," *Mammalia* 82, no. 6 (2018): 626-631; Anderson Feijó and Robert S. Voss, "A Neotype for *Didelphis marsupialis* Linnaeus, 1758," *American Museum Novitates* 2019, no. 3923 (2019): 1-12; and Newton Gurgel-Filho, Anderson Feijo, and Alfredo Langguth, "Pequenos Mamíferos do Ceará (Marsupiais, Morcegos e Roedores Sigmodontíneos) com Discussão Taxonômica de Algumas Espécies," *Revista Nordestina de Biologia* 23, no. 2 (2015): 3-150.

[76] Christopher Plumb, "Exotic Animals in Eighteenth-century Britain" (PhD diss., University of Manchester, 2010), 52, 55. Based on what I have found from the twentieth century, I suspect there are at least some opossums in earlier colonial European and postcolonial American folk art and landscape art out there, but to date I have not been able to track down any.

Renaissance Decorative Painting in Scotland (Fig. 15a).[77] There also are two found in Jan van Kessel the Elder's (1626-1679) *The Four Continents* series (1666), one in *America* based on Marcgrave's opossum and noted by Benjamin Schmidt (Fig. 15b), and one in *Asia* based on Nieremberg's opossum and documented by Marcaida (Fig. 15c).[78] Then there is a micromosaic plaque from 1797 attributed to Andrea Mazzesi (b. 1700s), clearly based off Merian's image (Fig. 15d); this unique piece is part of a private auctioneer's collection and does not appear to be published anywhere in the literature.[79]

Finally, there is a little-known oil painting of a Virginia Opossum family by the Florentine artist Bartolomeo Bimbi (1648-1729; active in the Medici court from 1670) (Fig. 15e). This may be an original image, as it predates the only published natural history print illustration found of similar composition by Martin Elias Ridinger (1730-1781) (Fig. 15f).[80] However, other than being documented in a single exhibition catalog, this piece appears wholly absent from the literature, and its exact origins remain a mystery.[81]

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[77] Michael Bath, *Renaissance Decorative Painting in Scotland* (Edinburgh: National Museums of Scotland, 2003), 156-7.

[78] Marcaida, "Juan Eusebio Nieremberg y la ciencia del Barroco," 229; Benjamin Schmidt, "Geography Unbound Boundaries and The Exotic World in The Early Enlightenment," in *Boundaries and Their Meanings in the History of the Netherlands*, pp. 35-61 (Leiden: Brill, 2009). Schmidt's article also provides insights into the issue of Kessel's placement of one opossum in America (correctly) and one in Asia (incorrectly) – see analysis.

[79] Alessandra Di Castro, *Micromosaic Plaque Depicting a Family of Philander Opossum*, 1797. Micromosaic, 7 9/10 × 10 1/5 in (20 × 26 cm). Artsy [online database]. https://www.artsy.net/artwork/andrea-mazzesi-micromosaic-plaque-depicting-a-family-of-philander-opossum.

[80] The existence of this later illustration by Ridinger adds another layer of mystery: did Ridinger see Bimbi's painting, or a copy of it, or did both Ridinger and Bimbi work from an earlier image which remains unaccounted for?

[81] Mrilena Mosco, *Natura viva in Casa Medici: Animal Paintings in the Medici Collection [National Academy of Design, New York, July 3 – September 10, 1986]* (Florence: Centro Di/Stiav spa, 1986), 52-3. Unfortunately, Bimbi's work appears poorly represented in English language scholarship in general, and this painting will not be covered further in this study.

Research Methodology

The preceding literature review revealed that much of the existing scholarship pertaining to the historical visual record of opossums is embedded within larger studies, with no single comprehensive study on the subject available. Furthermore, this scholarship is fragmented along both cultural and disciplinary lines, hindering the ability to understand both how Indigenous and European visual records intersected and interacted, and how all such images were produced via the combined mechanisms of science, art, and culture. This study offers an inclusive, fully-integrated mixed methodologies study, which synthesizes scholarship from across fields and likewise gathers images from across the spectrums of both culture and media. A combination of qualitative and quantitative analysis is performed by integrating artistic, cultural, and scientific lenses, in order to present a truly holistic study of the visual record. The specific methodological strategies identified as most conducive to the goals of the study are outlined below.

Integrated Iconographical Analysis via Visual Culture Studies

As previously stated, this study is, at its core, an iconographic investigation. While any such examination of a visual record also includes some degree of formal analysis of visual elements and aesthetics, my primary goal is to interpret images and connect these images to broader historical contexts, and thus the iconological dimension of iconography is foregrounded.[82] By investigating the full range of available images, this study also falls under the umbrella of visual culture studies. This modern superfield purposefully breaks through old delineations of discipline, culture, and media, making it the ideal paradigm for pursuing a fully inclusive reading of this visual record.

[82] In traditional iconographic analysis, iconology is the third stage after the describing and classifying which focuses on interpreting via consideration of cultural, social, and historical contexts.

Visual culture studies also freely utilizes other methodologies, allowing for the integration of other relevant critical lenses such as feminism and postcolonialism. As has already been demonstrated by Parrish's scholarship, it is through a feminist lens that one can better understand both how opossums became a symbol of model maternity on both sides of the Atlantic, and how each realm also developed their own additional gendered associations.[83] As an animal which has been portrayed by both native American and colonizing European cultures and was part of the Columbian exchange, a postcolonial lens can also provide valuable context to a comparative reading of the visual record, especially in light of the fact that Europeans specifically included opossums in their wider campaign of othering the New World. Furthermore, the postcolonial perspective can promote giving equal weight to Indigenous American and European visual records, as it rejects the monopoly of the "Western" canon and instead foregrounds cultural diversity in the study of creative works.[84]

Identifying Cross-Cultural Currents and Syncretism

As previously discussed, the historical visual record of opossums is split between the Indigenous American and European realms in the literature, with most scholarship limited to only considering one or the other. I bridge this divide by investigating iconography from both sides of the Atlantic. This enables comparing and contrasting representations both within and between biogeocultural spheres, as well as identifying cross-cultural currents and syncretism. These elements, in turn, can be analyzed through an understanding of how both convergence and divergence manifest as transformational processes in visual culture.

[83] Parrish, "The Female Opossum and the Nature of the New World."

[84] In addition to direct considerations of visual culture, I will also be applying knowledge gleaned from supplementary sources which record the opossum's cultural connotations in both Indigenous American and Colonial European oral and written traditions.

In addition to the general insights on cross-cultural exchange offered by applying a postcolonial lens, seminal studies specific to investigating syncretic processes in visual culture are consulted, such as Dean and Liebsohn's critical analysis of the use of hybridity as a conceptual framework, and Keating's advancement of the term metamorphosis to describe the transformation of objects through trans-cultural mobility.[85] Scholarship by Elizabeth Hill Boone and Donald Robertson on pre- versus post-conquest Mexican visual culture, as well as previously cited works covering the extant early colonial examples in this study, also include extended discussion of these concepts and are thus helpful for thinking through this angle of analysis.[86] Additional reference sources on material and scientific cultural exchange in the early modern Atlantic world also provide useful background information for grounding this study.[87]

Connecting the Images to the Real-Life Animals

Finally, scientific knowledge is applied to the readings of opossum images, in recognition of the fact that all have a real-life animal at their core. Beyond just making taxa identifications when possible, applying knowledge about opossum zoology provides valuable insight into

[85] Carolyn Dean and Dana Leibsohn, "Hybridity and its Discontents: Considering Visual Culture in Colonial Spanish America," *Colonial Latin American Review* 12, no. 1 (2003): 5-35, and Jessica Keating, "Metamorphosis at the Mughal Court," *Art History* 38, no. 4 (2015): 732-747.

[86] Elizabeth Hill Boone, "Pictorial Documents and Visual Thinking in Postconquest Mexico," in *Native Traditions in the Postconquest World: A Symposium at Dumbarton Oaks*, ed. Elizabeth Hill Boone and Tom Cummins (Washington, D.C.: Dumbarton Oaks, 1998), 149-99; Donald Robertson, *Mexican Manuscript Painting of the Early Colonial Period: The Metropolitan Schools* (Norman: University of Oklahoma Press, 1994).

[87] Daniela Bleichmar, Paula De Vos, Kristin Huffine, and Kevin Sheehan, eds., *Science in the Spanish and Portuguese Empires, 1500–1800* (Stanford: Stanford University Press, 2008); Jaime Marroquín Arredondo and Ralph Bauer, eds. *Translating Nature: Cross-cultural Histories of Early Modern Science* (Philadelphia: UPenn Press, 2019); Daniela Bleichmar and Peter C. Mancall, eds., *Collecting Across Cultures: Material Exchanges in the Early Modern Atlantic World* (Philadelphia: UPenn Press, 2011); Peter C. Mancall, *Nature and Culture in the Early Modern Atlantic* (Philadelphia: UPenn Press, 2018).

interpreting these images.[88] For example, familiarity with marsupial biogeography in general and opossum biogeography specifically is essential to mapping out the relatively late origins and awkward development of the European record, as well as its relation to the later Australasian record. Likewise, it is only through understanding the peculiarities of the marsupial reproductive system that one can fully grasp why pouches so confounded early European illustrators who were working from second-hand descriptions. Familiarity with morphological differences between opossums and similar-looking sympatric animals can also help discern which one is likely being depicted, and correct misidentifications in the record (such as in the case of the British Museum coatis mislabeled as opossums).

The Place of Ethnozoology and the History of Zoology in Scientific Identification of Images

Critical to interpreting opossum images in the Indigenous American visual record is the need to apply an informed ethnozoological lens. There are deeply-rooted connections between these cultures and their native animals, which permeate through both natural and supernatural associations. Even those depictions which appear to be naturalistic still tend to be connected to their otherworldly associations; conversely, even those forms which are fully deified often still have identifiable elements of naturalism. Composite animal imagery is also common in some cultures, and thus one must be on the lookout for opossum iconography entwined in such constructions. Furthermore, it is important to recognize that Indigenous cultures work within their own established systems of taxonomy which are under no obligation to conform to our modern scientific classifications. For example, while modern science recognizes that marsupial

[88] The following scientific texts will serve as the primary zoological references for the study, which will aid in applying scientific methodology to the reading of the images: C. Hugh Tyndale-Biscoe, *Life of Marsupials* (Collingwood: CSIRO publishing, 2005); Ronald M. Nowak, *Walker's Mammals of the World: Monotremes, Marsupials, Afrotherians, Xenarthrans, and Sundatherians* (Baltimore: JHU Press, 2018); Robert S. Voss and Sharon A. Jansa, *Opossums: An Adaptive Radiation of New World Marsupials* (Baltimore: Johns Hopkins University Press, 2021); and D. E. Wilson and R. A. Mittermeier, eds. *Handbook of the Mammals of the World: 5. Monotremes and Marsupials* (Barcelona: Lynx Edicions, 2015).

opossums are only distantly related to procyonid coatis, and thus places them in separate clades, it is also quite reasonable to accept that since these animals also share a number of key morphological, behavioral, and ecological similarities, that they could have also been sensibly classified together under another culture's own system.

Of course, even on the European and postcolonial American side, one must be cognizant of "folk taxonomy," especially given the fact that the opossum was first encountered and described before the advent of modern zoology (and was, in fact, one of the animals which precipitated its development). A working knowledge of the history of zoology is needed for sorting through the numerous names given to opossums in the visual record and matching them up to their generally accepted modern day equivalents. Even visual records which already have scientific names attached can be troublesome, as many of these names predate standardized classification (and even after standardization, names have continued to be revised). The written record can be further complicated by the fact that when Europeans first encountered small Australasian marsupials, they labeled many of them as "opossums" as well; it was not until much later that science figured out this radiation of marsupials was only distantly related and that new taxonomic classifications were needed.[89]

[89] In modern science, the common name "opossum" is applied exclusively to American marsupials, while "possum" refers to certain distantly related orders of Australasian marsupials; however, "'possum" is also a popular term for the Virginia Opossum in U.S. English vernacular. Such inconsistences and confusion in the application of common names illustrates why it is important to also cite scientific names in scholarship.

Chapter 3: Indigenous American Opossum Iconography

The Prevalence and Diversity of Indigenous Opossum Iconography Before and After Conquest

Analysis of Pre-Conquest Iconography

As revealed in the literature review, a number of scholars have felt compelled to comment on the multiplicity of the opossum's iconography in the pre-conquest Americas and how it transcended time, culture, and media across a wide span of geography.[90] Opossums play important roles in foundational sacred narratives, often as the bringer of fire, corn, and/or pulque (a traditional alcoholic beverage made from fermented maguey sap) to the first humans; in the K'iche' Maya *Popol Vuh*, it is also the first named animal persona of the grandfather deity Xpiyacoc.[91] They have cosmological connections with the moon, Venus, and the Pleiades, and especially the first light of dawn. They have been linked to multiple Mesoamerican deities including Quetzalcoatl, Tlaloc, Techalotl, Mayahuel, and Maya God N and God D, as well as shamanic transformation. They are associated with agricultural fertility, especially maize and maguey. They also symbolize human fertility and sexuality, often in gender-based duality: pregnancy, childbirth, and maternal care as female, potency and lust as male. The male opossum specifically is also connected to ritual entertainment, old age, and death and resurrection. Lastly,

[90] The opossum's many and varied symbolic identifications listed in this paragraph are all detailed in Austin, *Myths of the Opossum*, as well as being collectively documented by the scholarship covered in the Indigenous American visual record portion of the literature review.

[91] The creator grandparents Xpiyacoc and Xmucane are referred to by several paired titles, including two sets of animal personas: Hunahpu [O]Possum and Hunahpu Coyote, and Great White Peccary and Coati. Hunahpu Opossum presided over the dawn before the first sunrise, and the opossum is still associated with the darkness of night just before dawn in extant cultures such as the Tzotzil. Hunahpu Opossum is referred to as both "Grandfather" and "Old Man," and this persona is connected to the "aged deity" persona of Maya God N, who in turn sometimes takes the form of an opossum; the four Opossum Mams in the *Dresden Codex* are linked to this aspect of God N. See Karen Bassie, "Maya Creator Gods" (Mesoweb, 2002), and Taube, "Ritual Humor in Classic Maya Religion."

opossums are invoked in curing rituals and utilized in traditional medicine, with their tails ascribed an expansive list of healing properties, including for maternity care.[92]

What each of these scholars also asserts is that this symbolic versatility was directly related to the opossum's distinctive suite of zoological characteristics, features these cultures were presumably long familiar with given that Indigenous Americans had shared the landscape with them for millennia. In other words, opossums were encoded into Indigenous ethnozoological knowledge bases. It is, in fact, not difficult to match up each of the above symbolic associations with real-life opossum traits. For example, their rapid senescence (the average life expectancy in the wild for most species is less than two years), combined with their general appearance and movement (whiskers, snaggleteeth, awkward gait, and in some of the better-known species, grey/white fur) can be related to human old age and death, while their spells of thanatosis ("playing dead") can be related to death and resurrection. Their nocturnal and crepuscular habits can be connected to their cosmological associations, and combined with their alternating ground-dwelling and arboreal habits, also make them fitting mediators between the underworld and terrestrial realms. Their bare, usually prehensile tail is often featured in the fire theft myth, as it was used to carry the fire away, resulting in the hair being singed off (though some versions say it was the pouch which was used to spirit away embers).[93] Their agricultural associations are readily connected to their real-life fondness for raiding human crops and food stores (their thievery skills enhanced by their dexterous paws and climbing abilities), including the eating of corn and drinking of maguey sap. The connection to entertainers and ritual

[92] Hernandez and Sahagún both recorded long lists of medical uses for opossum tail, and sometimes its fat; many of these were related to acts of purging, expulsion, resolving blockage, etc., which included aiding mothers in childbirth and milk production.

[93] Austin, *The Myths of the Opossum*, 7.

clowning can be easily understood by observing their often-comical antics and propensity for mischief (and in areas where they were kept as pets, such behavior was likely observed up close and often), combined with an awkward threat display that resembles a wide grin as they hiss and bare their many teeth (50, the second highest number known in land mammals).

Last but certainly not least, there is the matter of their unique marsupial reproductive system, which inspired the gendered associations with human sexuality. Their robust fertility and fecundity and extended maternal care were invoked in matters of female fertility and maternity (Fig. 6a). Interestingly, however, the female pouch, arguably the single most notable feature of those marsupial species that possess one, is rarely directly referenced in oral traditions, and not at all in visual media.[94] Of those few surviving pieces which depict a mother opossum with young, those young are shown in the later stage when they switch to riding on the mother's back (Fig. 6b).[95] This absence from visual culture is indeed curious. Waldron offers the observation that, at least in South America, "mythic treatments of the opossum sometimes seem to go past the animal's distinguishing marsupial pouch to the deeper implication of it," citing for example myths which connect the opossum's bearing of tiny offspring with the gift of painless childbirth.[96] Still, this apparent disinterest in explicitly depicting the female's reproductive

[94] Contrary to popular belief, not all female marsupials are pouched, and there are several genera of pouchless opossums whose attached nursing young are not enclosed in any sort of protective structure. However, nearly all of the larger and most commonly known species are pouched, including the Virginia Opossum (Fig. 2).

[95] Smith offers one likely reason for why there are so few surviving pieces which explicitly depict female opossums in general, noting that these were more likely to be in the form of small figurines of primarily domestic use (fertility and curing rituals, children's toys, etc.), which in turn were more likely to be thrown away in the household trash if they were broken or otherwise spent (or perhaps disposed of during the New Fire Ceremony). Smith also distinguishes between the "great and little traditions of Mesoamerica," corresponding with the official state and private domestic realms respectively, and observes that by and large early colonial chroniclers almost exclusively documented the former, thus making archeological excavations one of the few ways to learn more about the latter. Likewise, it appears that male opossum imagery was more likely to be utilized in the former and female in the latter, further complicating our efforts to better understand the gendered symbolism of opossum iconography. See Michael E. Smith, "Domestic Ritual at Aztec Provincial Sites in Morelos."

[96] Waldron, *Handbook of Ceramic Animal Symbols in the Ancient Lesser Antilles*, 72.

anatomy stands in sharp contrast to what later happened in Europe, where the novelty of this previously unknown part made it a frequently depicted (and oft-exaggerated) feature.

On the other hand, the male's unique anatomical trait of a bifurcated penis and anteriorly positioned scrotum not only was the likely inspiration for the connections made to human male sexual potency and fertility, but may have also been occasionally depicted or otherwise referenced in ceramic figures.[97] It may have also played a role in connecting opossum iconography to the divinity of corn; as explained by Elaine Schele, a bifurcated penis resembles the structure of double-eared corn, a naturally-occurring mutation which some Mesoamerican cultures regard as a good omen assuring a fruitful crop for the following year.[98] This realization adds another dimension of meaning to the Zapotec "Opossum God" urn in Fig. 6c, which is depicted with two ears of corn; other urns from this same culture have been found depicting anthropomorphic forms with a single ear of corn as a clear phallic symbol.[99]

As previously reported, in addition to these gendered iconographies, scholars have observed certain opossum parts were schematized into standardized iconographies. Most prevalent amongst these is a circumocular marking, a feature present to varying degrees in many

[97] Both Usillos and Ugalde reference ceramic figures which appear to depict male opossum anatomy; however, other than one grainy black and white photo in Usillos' work, I have thus far not been able to locate images of any of the cited examples to confirm this. Waldron also mentions that the bifurcated penis was connected to the birth of twins in some regions, and that the double-pronged spears of the Yekuana tribe were symbolically connected to this feature (*Handbook*, 72).

[98] Schele's paper is focused on another male animal with a two-pronged penis, the snake, and suggests that the snake hemipenis is present in Mesoamerican iconography, offering a number of examples that appear to reference such a part. Whether they are in fact all meant to represent snake anatomy, or perhaps opossum anatomy, or just the concept of a forked male organ in general, is of course up for debate; regardless, it seems reasonable to accept that these cultures knew of this particular anatomical peculiarity in certain animals and could naturally associate it with the look of the double-eared corn mutation, as well as invoke it in human male virility. See Elaine Schele, "Potential Artistic Representations of the Snake Hemipenis in Mesoamerican Art" (FAMSI, 2007), http://research.famsi.org/aztlan/uploads/papers/schele-snake-hemipenis.pdf.

[99] See, for example, item Am1946,19.6 in the British Museum: https://www.britishmuseum.org/collection/object/E_Am1946-19-6.

species (Fig. 2), usually depicted in codices and painted ceramics as a thick and often teardrop-shaped black eye mask (Figs. 4a, 4b, 6b). Other commonly occurring iconographies are wide, teeth-baring grins (with or without paws-to-snout gesture); long, bare, and sometimes coiled tails (although in many effigies this feature is absent); bulbous noses; and the central head stripe of the *Didelphis* genus (which in the distinctive Zapotec iconography is often depicted by a ridged helix) (see Figs. 4, 6, and 7 for examples).

Post-Conquest Iconographic Disappearance

Unfortunately, this rich iconographic tradition almost entirely disappears shortly after conquest. Thus far, the only opossum found in the post-conquest codices is the previously noted costumed character in the *Codex Borbonicus* (Fig. 4b). Apart from this single image and the trio of Indigenous-Spanish colonial examples discussed next, thus far no other examples of opossums have been found in early modern Indigenous art dated past 1521. Opossum iconography in any notable quantity is not found again until its re-emergence in postcolonial cultures, on a much smaller and limited scale, usually as minor figures in folk art.[100]

Olson's study of pre- versus post-conquest figurine assemblages in commoner and elite Morelos households offers some sobering quantitative data to back up this observation. It is reported that even in the Postclassic-B Period (c. 1440-1540, i.e., just before and after conquest), 26.6% of commoner households in Yautepec had opossum figurines, along with 7.7% of elite households, with both classes also possessing a variety of other zoomorphic figures including birds, monkeys, lizards, rabbits, felines, and dogs. However, in the Colonial Period (1540-1650)

[100] Of course, as Robertson observes, folk art existed all through the colonial period as well, and it was in these arts that some remnants of the complex iconography and pantheon of pre-conquest times was saved, although its subject matter was often Christianized (Robertson, *Mexican Manuscript Painting of the Early Colonial Period*, I). It is thus reasonable to suggest that the opossums were taking refuge there all along, rather than just having suddenly re-appeared in the postcolonial age, although thus far I have not been able to find any surviving examples from before the early twentieth century.

households of both classes, the *only* zoomorphic figurines still found were dogs.[101] There is thus a rapid and total iconographic extinction reported in this locale – a story which appears to have been repeated again and again in conquered regions.

The Presence of Opossum Iconography in Early Colonial Art

Austin chronicles how at least some of the ancient Mesoamerican myths of the opossum survived the conquest, though they were converted into new Christianized contexts. For example, he relates how the opossum was recruited into the story of the Nativity, creating a syncretic myth: now he used his tail to steal fire from an old woman to bring back and warm the cold manger, and when his tail hair was burned off in the process, he exclaimed "oh Jesus, oh Jesus," which then became the name of the Christ child.[102] The opossum's pre-conquest symbolic associations with both fruitfulness and resurrection also naturally fit into Christian theology, which could explain how they appear to have ended up on at least two murals painted by Nahua artists for Spanish missionaries.

The Malinalco and Casa del Deán Murals

In Mexico, there are two rare examples of preserved early colonial mural cycles, at Malinalco and the Casa del Deán. In both cases, these sixteenth century paintings were created by newly-evangelized Nahua under the direction of Spanish missionaries, utilizing a combination of Indigenous and European artistic styles and iconography. Furthermore, in both cases, the Christian-themed scenes were populated with native American fauna and flora. As previously noted, Peterson and Morrill's monographs attempt to identify the cast of animal characters in

[101] Olson also notes that pre-conquest elite households had fewer zoomorphic figures in general, and that dogs were by far the most common of these in the Postclassic-B (61.5%), further supporting the theory that small opossum figurines were primarily utilized in commoner domestic rituals, especially by and for women.

[102] Austin, *The Myths of the Opossum*, 215, citing James M. Taggart, who records the Huitzilan version of the story in full. This version ends with the opossum becoming martyred as it tries to steal a chicken to feed Mary. See *Nahuat Myth and Social Structure* (Austin: University of Texas Press, 2010), 103-4.

each respective mural cycle, and both include opossum identifications. However, in each case, these identifications are uncertain, and even after applying an informed zoological lens to these images, I find these identifications difficult to confidently make. However, what I believe to be the most likely cases do not match up with their top choices, as elaborated on below.

Malinalco

Peterson identifies two figures as opossums (Figs. 8a, 8b), but for some reason, is more confident in the first identification, even while admitting that two important features are missing, the ears and tail. Furthermore, the legs appear far too long, and the muzzle also does not conform to opossum morphology as strongly as Peterson suggests. The figure may instead be an Agouti (*Dasyprocta* spp.), a native rodent species which is relatively large, long-legged, small-eared, and tailless, or perhaps some sort of canine whose ears have worn off and tail is obscured, such as a miniature Xolo.[103] On the other hand, the second figure, which Peterson expresses uncertainty over on account of its shorter snout and it allegedly looking proportionately more like how rats were depicted in the *Florentine Codex*, seems a far more likely candidate to actually be an opossum. From the relatively shaggy body versus bare prehensile tail, to the grasping hands and feet (there even appears to have been an attempt to depict its back "thumb"), to the actually present and correctly-shaped ears and bared mouthful of teeth, this figure presents a far more believable opossum-like morphology, even in spite of the short snout.

But perhaps the strongest piece of evidence is its size proportional to the fruit it is holding and eating, a fact Peterson also acknowledges. What exactly this fruit is remains uncertain; Peterson identifies it as a pomegranate (*Punica granatum*), introduced from the Mediterranean

[103] The Xolo, aka the Mexican Hairless Dog, is an ancient Mesoamerican breed and important figure in Aztec tradition, and today is the national dog breed of Mexico.

region, but others have identified it as guava (*Psidium guajava*), a native fruit.[104] In either case, it is a fruit large enough to rule out a smaller rodent. As this is a "paradise garden" – that is, a proxy for the Garden of Eden – the fruit trees are clearly being utilized as Christian symbolism, as are the animals eating its fruit. If the fruit is indeed pomegranate as Peterson claims, this certainly would strengthen the opossum case: in Christianity, pomegranates are linked with fertility and resurrection, two of the opossum's most prevalent pre-conquest Indigenous symbolic values as well. But even if the fruit is guava, or any other kind of fruit for that matter, the general symbolism of fruit equating to fruitfulness still supports the opossum's presence.

Casa del Deán

The animal figure identified by Morrill as an opossum (Fig. 9a) is even more problematic than Peterson's first candidate from Malinalco. Morrill's primary piece of evidence is the bare tail; yes, it is bare, but also depicted rather small, thin, and curly, which in addition to being rather un-opossum-like is not how it was ever depicted in pre-conquest images.[105] The other evidence given is its possession of a guitar; Morill cites a Mazatec myth about a guitar-playing opossum. However, such a myth must have only been constructed post-conquest, as the guitar arrived with the Spanish; it is unclear how old this tale is and if it yet existed when this mural was made, which would seem important to know to positively make this connection.

On the other hand, Morrill identifies two images as possible coatis, neither of which is very convincing; however, one seems much more likely to actually be an opossum, based on a combination of its physical features and jewelry (Fig. 9b). The ears, while admittedly a bit larger

[104] Carmen Zepeda and Laura White, "Herbolaria y Pintura Mural: Plantas Medicinales en los Murales del Convento del Divino Salvador de Malinalco, Estado de México," *Polibotánica* 25 (2008): 183, Fig. 6.

[105] Interestingly, in Audubon's famous image of the Virginia Opossum (Fig. 16b), the tail is depicted with similar curl – but it is curled around a branch to illustrate its prehensile quality, whereas in this figure it is drawn like a spring, in the manner one might represent a domestic pig's little curly tail.

and longer than a typical opossum, are certainly nothing like a coati, whose ears are small and round (Fig. 3).[106] Likewise, while the tail is only nominally like that of an opossum, it is nothing like a coati, which is thick, furry, and usually held upright. However, it is the necklace this figure wears which most strongly suggests it was meant to represent an opossum. The teardrop-shaped pendant is readily recognizable as an *oyohualli*, an ornament with a long pre-conquest history in Mesoamerica. Its exact meaning remains uncertain – Taube connects it to sensuality, pleasure, and dance, while Michael Coe relates it to more overt sexuality and sexual pleasure, and, given its shape, the female vulva.[107] Regardless, the animals most often seen wearing it in early Indigenous art are monkeys and opossums.[108] As seen in Fig. 4a, one of the Opossum Mams in the *Dresden Codex* wears it on its breastplate, as does one of the Zapotec effigies in Fig. 6d, along with the plumbate ware opossum in Fig. 6e, whose likeness appears to have circulated around the region.[109]

Morrill is uncertain if the animal's cup is meant to contain cocoa, with the bag in turn containing cocoa beans, or pulque, since it looks similar to pulque cups depicted in the codices. If it is the latter, this again would strengthen the case for the opossum identification, as this is

[106] Young opossums do often have ears which stick out more and look proportionally larger and longer than when they are adults. There is also iconographic precedent for opossum ears to be exaggerated in this way, as Wilbert observed this tendency in the Manteño-Huancavilca spindle whorls; see Fig. 7b for an example.

[107] Taube, "Ritual Humor in Classic Maya Religion," 151; Donna Urschel, "Love & War: Shell Pendant Reveals Clues to Ancient Toltec Culture," *Library of Congress Information Bulletin* 68, no. 6 (June 2009): https://www.loc.gov/loc/lcib/0906/toltecs.html.

[108] For monkeys, see Taube, 151; for opossums, see Figs. 4a, 6d, 6e.

[109] Plumbate ware was widely traded regionally during the Early Postclassic (900-1200 CE), and this figure must have been produced in some quantity as I have found almost identical figures in a number of other collections. While this zoomorph has also been repeatedly misidentified as a coati in those collections, Austin correctly recognizes it as an opossum (*Myths of the Opossum*, 326, Fig. 15b).; see the figure label for more information in support of this identification.

one of its common pre-conquest symbolic associations.[110] However, the other possible "coati" figure (which also barely resembles a coati but is not particularly opossum-like either) is shown with this same kind of cup, adding to the uncertainty. Each of these three figures' placement in the mural cycle does not help much either; the pendant-wearing one is found in the "Triumph of Death," while the guitar-playing and cup-bearing ones are found in "The Triumph of Eternity." In further support of the identification of the guitar-playing figure as an opossum, Morrill asserts that the opossum's perceived resurrection after a spell of thanatosis "is reflective of the theme that is central to the mural cycle: Christ's victory over death in the Resurrection brings the gift of redemption and eternal life to all believers. For this reason, the artists chose to place the opossum above the triumphal figure of Eternity."[111] However, there can be an equally strong case made for the opossum's inclusion in the Death mural. The scene features both Death riding a chariot with the Moerae, the three Greek goddesses of Fate who were also said to be the daughters of Night, and a funeral procession. As previously noted, opossums had strong pre-conquest symbolic associations with both night and death, and there are numerous examples of opossum-shaped funerary urns and other mortuary goods, with its image even carved into a human skull in one unique example (Fig. 6f).[112]

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[110] As Morrill notes, pulque itself underwent a symbolic transference during the early colonial period, coming to symbolize the wine of the Holy Eucharist; as it was a sacred drink to the Aztecs pre-conquest, and one specifically associated with the concept of divine blood, it was a relatively straightforward convergence of beliefs. See Morrill, *The Casa del Deán*, Chapter 7.

[111] Morrill, 187.

[112] Fig. 6f shows a closeup of the jaw of a carved skull featured in the Casa del Medrugo's *Amos por Siempre: El Misterio De Los Craneos Zapotecas* exhibition, titled *El Señor Que se Marcha* (*The Lord Who Leaves*). As described in the official exhibition material, "the carving on the jaw has the image of an opossum marsupial, which in Mixtec culture is related to death." It is dated to c. 900-1521 (pre-conquest). Unfortunately, I have not been able to find any additional literature on this piece other than what was given in the exhibition. See https://www.youtube.com/watch?v=A1pQGCvhoFk (virtual video tour) and https://artsandculture.google.com/asset/the-lord-who-leaves-unknow/GgH4ZbRuu9hmLw?hl=en (virtual exhibitions pages on Google Arts & Culture).

Unfortunately, there are multiple layers of uncertainty in these images which hinder any definitive conclusions. In addition to the previously noted issue of some regional iconographic overlap in opossum and coati imagery, the entire assemblage of animal characters in this mural cycle is rendered in a highly idiosyncratic style, with the identifications of several other figures also difficult to confidently make. The tails in particular often seem mismatched to the animals they are attached to, suggesting that perhaps some intentional composite zoomorphic iconography was being utilized. In one particularly confusing case, an animal which in all other respects is clearly a rabbit is depicted with a long, furry tail; but the only rabbit-like creature with such a tail is the Viscacha (*Lagidium* spp.), found only in parts of South America. Morrill suggests this was perhaps meant to be an attached monkey tail, as both the rabbit and monkey in this mural are depicted as scribes and there is also pre-conquest iconography linking the two animals together in scribe symbolism. However, the mural's actual monkey figure is rendered with a very different tail – and one of the few which are morphologically accurate – while the rabbit tail looks more like the one attached to the "coati" figures. Lastly, as Morrill cautions, it is important to recognize that these murals underwent extensive renovations in 2010 and some of the animal images may have had key physical features altered; regrettably, the pendant-wearing figure is one of these, as Morrill includes images from before and after restoration which shows both its snout and tail had been retouched, amongst other alterations (Fig. 9c). As Morrill further notes, the murals may have been previously retouched at other points over the centuries as well, making the original appearances of these animals even less certain.

The Florentine Codex

There is no such uncertainty with the identifications of the two opossum images in the *Florentine Codex* (Fig. 10), as they appear with this animal's entry in the main text. They are

found in Book 11, *Earthly Things*, dedicated to cataloging the Aztecs' native fauna and flora. The twelve-volume work was the mastermind of Sahagún, a Spanish missionary, but was created in conjunction with his Nahua students, who aided in collecting and translating Indigenous knowledge (collected via a Sahagún-designed questionnaire sent out to village elders) and also created all the illustrations. The work is seemingly an exemplar of the hybridity of post-conquest codices; the artists worked in a mix of Indigenous and European styles, using a combination of Indigenous and European pigments and inks, and the text was presented both in Nahuatl (written by the students) and Spanish (as translated by Sahagún). However, while classified as a codex, it was fundamentally different than other post-conquest codices, in both purpose and design; specifically commissioned as an encyclopedic ethnography, its approach to organization of knowledge was modeled primarily on earlier classical and medieval European sources. This, in turn, makes the animal section reminiscent of a medieval Bestiary.

The two small images of a male and female opossum are both strangely portrayed as plain grey canine-like quadrupeds. However, one can observe that this rendering is very similar to several of the other mammals illustrated immediately before and after, including the coati, raccoon, skunk, and various rodents, all also presented as little grey quadrupeds without any identifying pelage markings. Given that so many of the other animals in this volume are represented with reasonably accurate morphology, colors, and markings, this lack of detail seems puzzling. However, Kerpel's account of the book's production history offers some clues. It is reported that work on Book 11 was disrupted in August 1576 by an epidemic which may have killed over eighty percent of the region's Indigenous population and claimed the lives of many of Sahagún's students (presumably including some of the artists).[113] Furthermore, during this crisis,

[113] Kerpel, *The Colors of the New World*, 50-1.

their pigment supply was exhausted (the images in the second half of the book are, in fact, rendered in only black and white because of this).[114] Despite the probable lack of both pigments and trained artists, there was still an effort made to differentiate between the different animals via adding a few defining features to the otherwise generic quadruped model; for the opossums, this can be seen in the rendering of its tail and, in the case of the female, the addition of babies poking out of the pouch. The text, which was likely already written before the plague hit, is much more illuminating, as it documents the Aztec's ethnozoological knowledge, including detailed information on the medicinal use of opossum tail.

Summary

In each of these early colonial examples, we find Indigenous American artists who were already being acculturated by a European, Christian education tasked with creating images in the service of Spanish missionaries. As this art visibly combined Indigenous and European technique and iconography, its visual style is often characterized as "hybrid."[115] However, it should be recognized that there were already rich traditions of both mural painting and illuminated manuscript production in pre-conquest Mesoamerica, which in a number of ways paralleled Europe. Thus, these works are perhaps better characterized as products of artistic confluence, rather than "the seamless fusion, or joining, of two opposing identities" Keating suggests the term "hybrid" often implies.[116] Likewise, in their incorporation of native American nature into imported Euro-Christian frameworks, there was not just simple mixing of iconographies, but

[114] Kerpel, 50-1.

[115] See Dean and Leibsohn, "Hybridity and its Discontents."

[116] Keating, "Metamorphosis at the Mughal Court," 745.

rather active transfer and re-contextualization. Keating argues that such processes are inherently generative, and thus better understood as "metamorphic" rather than "hybrid."[117]

Furthermore, as Peterson points out, how these processes played out for specific fauna and flora iconographies in the early colonial period was directly influenced by biogeography; that is, whether the taxon was previously known to only one continent or the other or was common to both.[118] For those taxa already known to both cultures, "acculturative solutions varied," depending on whether there was a convergence of similar meanings which could be easily fused, or a divergence which had to either co-exist or otherwise be reconciled.[119] However, a European import such as the pomegranate did not have any prior meaning in the Americas, and thus the Indigenous artists transferred its pre-existing Christian symbolism directly into the new colonial murals. On the other hand, an American endemic such as the opossum did not have any prior meaning to Europeans, and thus its inclusion in the murals was dependent on the Indigenous artists understanding how its pre-existing Indigenous symbolism was transformable into new Christianized contexts. And because the opossum had so many pre-conquest symbolic associations, it was not difficult to find at least a few which were readily compatible with Christian theology, especially with regards to fruitfulness and resurrection.

Furthermore, Europeans quickly developed an intense interest in the opossum following their "discovery" of it, as it was for them not only a new animal, but one with a previously unheard-of anatomical feature. This burgeoning curiosity not only assured the creature would

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[117] Keating, 733, 746.

[118] Peterson, *The Paradise Garden Murals of Malinalco*, Chapter 5.

[119] Peterson, 123. In the case of butterflies, there were convergent beliefs across Indigenous American and European cultures about them representing souls of the dead (120). Falcons likewise had associations with kingship on both sides of the Atlantic; however, their depiction on the murals eating captured prey is suggested by Peterson to emphasize their additional Indigenous associations with warriors and blood sacrifice (116, 120-1).

receive a substantial text entry in the *Florentine Codex*'s animal catalog, but also compelled depictions of both the male and female, and specifically, a female with young in its pouch. This form of representation was new for the opossum in the Americas; side-by-side depictions of male and female opossums appear wholly absent from pre-conquest iconography, as are female opossums with young still in the pouch. As discussed in the next section, there were also numerous attempts on the European side to depict this novel creature and its unique anatomy, with mixed results; and the success of those results can be related to the degree of the artists' exposure to Indigenous knowledge.

Chapter 4: European Opossum Iconography

The First European Image and Other Misinterpretations of Female Opossums

The *Simivulpa*

As previously noted, the earliest surviving European opossum image is in the form of a map icon found on the Waldseemüller *Carta Marina Navigatoria* map of 1516 (Fig. 11a). Van Duzer provides a translation of its accompanying legend: "An animal that looks like this is found here; it has a bag under its belly where it carries its offspring, and it only allows them out for nursing. One such animal was given to the King of Spain in Granada."[120] As Van Duzer notes, both the description and the reference to the King of Spain was taken directly from contemporary published narratives of Vicente Yáñez Pinzón's (1462-1514) voyage of 1499-1500, during which the first known European exploration of Brazil was made. The most common version of this story, later translated in John Ogilby's (1600-1676) *America* (1671), went as follows:

> Between these Trees he saw as strange a Monster, the foremost part resembling a Fox, the hinder a Monkey, the Feet were like a Mans, with Ears like an Owl; under whose Belly hung a great Bag, in which it carry'd the Young, which they drop not, nor forsake till they can feed themselves. Pinzon caught one of them with three Young, which died in the Voyage, but the Dam he presented alive Granada to the King.[121]

Another version of this narrative was published by Peter Martyr d'Anghiera (1457-1526) in the form of a letter he had written to Cardinal Ludovico D'Aragon (1474-1519), notable for the additional information that both men had at some point examined a dead specimen:

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[120] Van Duzer, *Martin Waldseemüller's 'Carta marina' of 1516*, 93.

[121] Translation from John Ogilby, *America: Being the Latest, and Most Accurate Description of the New World* (London, 1671), 59, https://quod.lib.umich.edu/e/eebo2/A53222.0001.001/1:5.3.3?rgn=div3;view=fulltext. Ogilby's book also included an illustrated plate imagining this encounter, using the Waldseemüller image as the template for this "monster" – see Fig. 11c.

> An extraordinary animal inhabits these trees, of which the muzzle is that of the fox, while the tail resembles that of a marmoset, and the ears those of a bat. Its hands are like man's, and its feet like those of an ape. This beast carries its young wherever it goes in a sort of exterior pouch, or large bag. You have seen one of these animals, at the same time that I did. It was dead, but you have measured it, and you have wondered at that pouch or curious stomach with which nature has provided this remarkable animal for carrying its young and protecting them either against hunters or beasts. Observation has proven that this animal never takes its young out of this pouch save when they are at play or nursing, until the time comes when they are able to fend for themselves. The Spaniards captured one such with its young, but the little ones died one after another, on shipboard. The mother survived a few months, but was unable to bear the change of climate and food.[122]

Van Duzer theorizes that the map icon was based on an even earlier, now lost original image, which is quite plausible; however, whomever did first draw it must have been working from a second-hand description rather than an actual specimen, given its wildly inaccurate, monstrous appearance. While the above narratives suggest at least a few privileged Europeans in Spain and Italy had a chance to see one of these very early specimen imports, most Europeans were left to try to imagine its appearance based on the jigsaw animal descriptions from the earliest travelers, and later, this first visual interpretation of those descriptions. Iterations of this image were subsequently spread across Europe through various media, where two young were soon added: first via other maps, then in early zoological texts, followed by emblem books and other print illustration, and in at least one case, even into fine art (Figs. 11b, 11c, 15a).

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[122] Translation from Peter Martyr d'Anghiera, *De orbe novo*, trans. Francis Augustus MacNutt (New York: Putnam, 1912), https://www.gutenberg.org/files/12425/12425-h/12425-h.htm.

No version of Pinzón's narrative claims any presence or help from local natives when he found and captured the opossum mother and young, and no name for it, Indigenous or otherwise, is recorded. It was simply referred to as a "monster" or "beast." It was later dubbed a *Simivulpa* (Latin for "ape-fox") by Conrad Gessner (1516-1565) in his landmark *Historia animalium* animal encyclopedia (five volumes, published 1551-1587), considered a foundational text in the field of modern zoology. The opossum was the only one of the newly reported American animals Gessner included in his first edition of 1551, and its entry was illustrated with the Waldseemüller image. Gessner clearly had yet to see the animal for himself.

Rice observes that he and other naturalists also struggled with the fact that there was no record of this animal in canonical Classical sources such as Aristotle and Pliny, and it was this complete absence of ancient authority that forced them to "resort to a simplistic kind of comparative anatomy" when describing it.[123] At the same time, the fact that the opossum was such an unprecedented peculiarity forced them to question those old paradigms of natural order and construct their own authority based upon newly gathered information. Gessner asserted such authority when he gave this "beast" its own name, although as Rice notes, in doing so he also "perpetuated the notion of its hybridity even while legitimizing the animal with a Latin name."[124]

Other Strange Pouched Beasts

While the *Simivulpa* image was widely distributed, there are a few other examples of images which appear to have been independently created based on attempts to interpret the early chimeric descriptions. Etienne Delaune's allegorical representation of America in *The Four Quarters of the World* series (1575) features a quadruped beast being subdued by a nude female

[123] Rice, "Villamena's Kangaroo," 389.

[124] Rice, 390.

figure, whom Parrish describes as a sort of hybrid of the Classical figure of Diana and a stereotyped Indian Huntress (Fig. 12a).[125] The only indication that this animal was likely meant to represent a "monstrous" opossum is the presence of a small pouch with a baby peeking out.

A similar example can be found in on the title page of Cornelis de Jode's *Speculum orbis terrae* atlas from 1593 (Fig. 12b). Once again, an invented opossum emblem represents America, this time looking somewhat like a camel, but with a front pouch containing two young signifying its identification as a marsupial. It is this image which Rice believes served as the main inspiration for Francesco Villamena's 1602 "kangaroo" image (Fig. 12c), a theory further bolstered by the fact that both images also feature pairings with lions (although in the case of the atlas, the pairing is only superficial, as they are on opposite sides of a "four corners of the world" composition, with the lion representing Africa). Rice is correct to assert that its resemblance to a kangaroo is in all likelihood just uncanny coincidence, as there is no credible evidence suggesting that Europeans had yet seen any Australasian marsupials.

The Impact of Direct Observation and Integration of Indigenous Knowledge

While the earliest European opossum images were odd and inaccurate portrayals based on second-hand descriptions, eventually more realistic images also began to appear.
While the above images were all produced by Europeans who likely had never actually seen an opossum and only knew of its existence through second-hand knowledge transmitted via early traveler reports, Europeans who traveled to the Americas and had seen the animals for themselves also began to create their own images. The scientific accuracy of these images benefitted from not only the knowledge gained by direct observation, but also from direct interaction with Indigenous knowledge. These European chroniclers not only applied Indigenous

[125] Parrish, "The Female Opossum and the Nature of the New World," 486-7.

names to these animals' images, but also made sure to cite information said to have been taken directly from conversations with the local peoples.

Oviedo *Churcha* (Caribbean, early 1500s, original sketch unpublished)

While Fernández de Oviedo's eyewitness chronicles of the Spanish colonization of the Caribbean, *Historia general y natural de las Indias*, were widely read as they were published in the mid-sixteenth century, the volume on land mammals was originally published without any of his illustrations included. Daymond Turner's investigation of the "forgotten treasure" of Oviedo's art includes the revelation that not only did Oviedo provide an important early first-person account of an opossum, but also sketched it.[126] Tragically, as Turner reports, the originals of this and his other drawings are now lost. However, Turner provides the details of an eighteenth-century manuscript stored in the archives of the Real Academia de la Historia (RAH) Madrid which appears to have faithfully copied Oviedo's original illustrations, including his opossum (Fig. 13a). Turner also brings attention to the fact that the illustrated nineteenth century edition of Oviedo's "complete" oeuvre of over 50 books, published between 1851-1855 and the edition whose images are the best-known today, not only grossly altered many of Oviedo's original published images, but appears to have used stock images to populate the land mammals volume. As seen in Fig. 13a, this was especially unfortunate in the case of the opossum, which was absurdly illustrated with what appears to be an Australian kangaroo.

Although just a rough sketch, Oviedo's image still manages to convey a better understanding of the opossum's marsupium as a pouch with an incised opening, rather than a bag or sack as it was erroneously described and illustrated as the *Simivulpa*. In his text (which was published), Oviedo not only reports on his own experiences with opossums raiding his chicken

[126] Turner, "Forgotten Treasure from the Indies;" opossum, 33-4.

coops, but also gives the local Indigenous name for the animal. This model of asserting authority via a combination of eyewitness reports and reporting Indigenous names and knowledge would become the common model for later opossum accounts and their accompanying images.

Staden *Serwoy* (Brazil, published 1557)

Hans Staden's woodcut image of an opossum (Fig. 13b) can be found in his book *Warhaftige Historia und beschreibung eyner Landtschafft der Wilden Nacketen, Grimmigen Menschfresser-Leuthen in der Newenwelt America Gelegen* (*Hans Staden's True History: An Account of Cannibal Captivity in Brazil*), a sensationalized chronicle of his time as a captive of the Tupinambá in Brazil which he illustrated himself. Like Oviedo, Staden's description included both his own eyewitness account and collected Indigenous knowledge, including applying the local Indigenous name for the animal. Staden's simple line composition depicts the opossum as some sort of cross between a rodent and weasel; still, it is a significant improvement from the *Simivulpa* in terms of morphological accuracy, especially in its rendering of long tail and inclusion of whiskers, as well as its treatment of the pouch. Like Oviedo, Staden clearly understood that this pouch was not some hanging bag, but rather an incised opening, which he represents here with a simple line (and, interestingly and rare for the period, no visible young).

Nieremberg *Tlaquatzin* (published 1635; original from Hernandez expedition c. 1570-77?)

The woodcut illustration of a mother opossum with young is a standout image in Juan Eusebio Nieremberg's expansive *Historia naturae* of 1635 (Fig. 13c). Marcaida's chapter recounts the tale of the opossum as the ultimate New World jigsaw animal, making Nieremberg's depiction so important to the history of early modern zoology. It is the earliest surviving European example of a wholly naturalistic image of a "real" opossum, with a highly

detailed rendering of morphology. The long curly fur suggests it may be a Woolly Opossum (*Caluromys* spp.), although the overall body shape suggests one of the larger *Didelphis* species.

Furthermore, Marcaida points out that Nieremberg's opossum was the model for one of the few known examples of an opossum in early modern European art outside print media, found in Jan van Kessel's *The Four Continents* series (Fig. 15c) – which is, curiously enough, placed in Asia rather than America. Although Schmidt only mentions Kessel's placement of the Marcgrave opossum in America (see next section), his article also speaks to the issue of Nieremberg's opossum being placed in Asia, as he characterizes this series' "haphazard assembly of exotica from around the globe [in which] objects are in disarray and, in a crucial sense, decentered" as typifying the "mix and match quality" of Dutch iconography from this period, as objects from the Dutch West India East India Companies "merge[d] into a single exotic world" in both physical collections and in visual media."[127] Both opossums, along with the entire sprawling cast of "exotic" animals Kessel populated his *Four Continents* series with, are thus employed as props to other the non-European world.

Although Nieremberg never traveled out of Spain, Marcaida explains that he had full access to the voluminous records from Francisco Hernández's (1514–87) scientific expedition to New Spain from 1570-1577. Much of Nieremberg's detailed description of the opossum is taken directly from Hernández's own account – it was Hernández who first recorded the local Aztec name for the animal and the many medicinal properties attributed to the tail. Hernandez also appears to be the first European to have described how it could "play dead" – a behavioral trait which, as previously noted, native populations had been familiar with for millennia and referenced often in myths and legends and their associated imagery.

[127] Schmidt, "Geography Unbound," 55-9.

Although this illustration is attributed the Flemish woodcut artist Christoffel Jegher (1596–1652), it very likely was derived from an unpublished illustration in Hernandez's expedition records. Marcaida's own dissertation is focused on the *Historia naturae*, and in it he notes that Hernandez had employed local artists to aid in illustrating the native biota he documented; this means that the opossum image may have well originated from an Indigenous American artist.[128] However, such attributions can ultimately only be conjecture, as sadly most of Hernandez's original records were destroyed in a fire in 1671.

Marcgrave and Eckhout *Taibi / Carigueya* and *Aguaja* (c. 1637-44)

Out of the short-lived colony of Dutch Brazil in the seventeenth century came an exceptional cache of images of native fauna, flora, and peoples, which were commissioned by the governor of the colony, Prince Johan Maurits van Nassau-Siegen (r. 1637-1643).[129] Scholars observe that included in this visual record of colonial natural history are some of the earliest known full-color *in situ* depictions of a number of native American animals by Europeans, including opossums (Figs. 13d, f, g) – most of which also have their local Indigenous names recorded. The artistic quality and scientific accuracy of these zoological images can be attributed both to the fact that Maurits made sure that both skilled artists and scientists were in his court, and that they in turn interacted with local Indigenous knowledge.

This included the naturalist George Marcgrave and physician Willem Piso (1611-1678), whose work led to the highly influential *Historia Naturalis Brasiliae* (1648), the first published natural history of Brazil. Marcgrave and Piso also extensively studied and recorded Indigenous

[128] José Ramón Marcaida, "Juan Eusebio Nieremberg y la Ciencia del Barroco. Conocimiento y Representación de la Naturaleza en la España del Siglo XVII" (PhD diss., Universidad Autónoma de Madrid, 2011), 168, 194.

[129] Information about the Dutch Brazil collection given in this section is detailed in Cristina Ferrão and José Paulo Monteiro Soares, *Brasil-Holandês / Dutch-Brazil*, and Peter Whitehead and Marinus Boeseman, *A Portrait of Dutch 17th Century Brazil*.

knowledge. Marcgrave also illustrated many of the specimens he studied, and the watercolor from *Libri Principis* (1637/1644) of the *Taibi* or *Carigueya* (White-eared Opossum, *Didelphis albiventris*) in Fig. 13d is usually attributed to him.[130] This image was later translated into a poor-quality woodcut in *Historia Naturalis Brasiliae* – with the addition of two young by Piso – and it was this version of the image which was subsequently lifted for use in other texts and widely circulated. This includes Charles de Rochefort (1605-1683), who used it to illustrate "L'Opassum" in his own book *Histoire naturelle et morale des iles Antilles de l'Amerique* (1658) (Fig 13e); this is the earliest illustration found referencing the now-standard English name derived from Powhatan, first recorded in the early 1600s by John Smith (as *Opassum*) and William Stratchey (as *Aposoum*).[131] However, it appears that Kessel may have seen the original watercolor, given its similar coloration in the *Four Continents* series (this time placed correctly in the America panel) (Fig. 15b).

The Dutch Brazil colony's court talent also included the painters Albert Eckhout, to whom most of the zoological, botanical, and ethnographic paintings are attributed to, as well as Frans Post (1612-1680), who painted landscapes. Figs. 9f and 9g are both often attributed to Eckhout (he rarely actually signed his works), as are the majority of the images in the *Theatrum Rerum Naturalium Brasiliae* collection (1637/1644). His painting of the White-eared Opossum is especially stunning, both outshining Marcgrave's version and rivaling Nieremberg's opossum for

[130] Some sources identify both Fig. 9d and 9f as the similar-looking Common Opossum (*Didelphis marsupialis*), aka the Black-eared Opossum, which is possible, as not all individuals actually have black ears (*Didelphis* coloration exhibits a high degree of intraspecific variation, which can complicate identification). Marcgrave's images are labeled with both the *Taibi* and *Carigueya* names at various points, and he also recorded a third local name in his text, *Iupatiima*.

[131] In the 1661 English translation of this work, *The History of the Caribby Islands*, the mammal labels are mixed up, with the opossum mislabeled as the muskrat and the agouti mislabeled as the opossum.

the title of the most scientifically accurate depiction from this period.[132] It should also be noted that there is a good chance Marcgrave and Eckhout's images of this animal were based upon the same individual, as it has been observed that their respective outputs appear to "refer to a same basic nucleus of models" collected for the court – many of which were likely live captive or dead specimens procured from local Indigenous traders.[133]

Plumier *Manicou* (Martinique, c. 1690, unpublished)

Charles Plumier's opossum illustration (Fig. 9h) was found amongst the nearly 6000 illustrations of flora and fauna Plumier observed during his three expeditions to the Caribbean. As Pietsch reports, while many of his flora records were published, most of his fauna records were not, including this image.[134] It is also interesting to note that since this image was never published, it never found its way into fine arts as the previous examples all did. Plumier, who supported the development of universal taxonomy a century before Linnaeus finally codified such a system, appears to have recorded two proto-scientific names on the page, *Manicou Caraibarum* and *Carigueya Marcgravii*, combining Indigenous and Latin nomenclature.[135] *Manicou* comes from its local Indigenous name (still in regional use), which was combined with the geographical epithet; the second name is of course a direct citation of Marcgrave's *Carigueya*

[132] Of course, his work benefits from being in an original in full color; one can only imagine how good the original illustration of Nieremberg's opossum was, it may well have been on the level of Eckhout's.

[133] Dante Martins Teixeira, "The Image of Paradise: An Iconography of Dutch-Brazil (1624-1654) on the New World's Fauna and Flora," in *Brasil-Holandês / Dutch-Brazil*, eds. Cristina Ferrão and José Paulo Monteiro (Rio de Janeiro: Editora Index, 1995), 141-183.

[134] Plumier's work as "the king's botanist" was much wider known in his time, as it remains today; the flowering plant genus *Plumeria* (also their common name) is even named for him.

[135] Parrish relays the fascinating fact that Benjamin Smith Barton, an early nineteenth century American naturalist, also constructed a hybrid Indigenous-Latin scientific name for the opossum – even though by this time the Linnaean scientific name *Didelphis marsupialis* was in standard use (along with the recently distinguished northern variety, *Didelphis virginiana*). Parrish attributes his "nomenclatural revolt" to his belief in "the descriptive imperfection of European-derived names," and instead asserted that the Lenape name *Woapink* – "white-face" – was superior. See Parrish, "The Female Opossum and the Nature of the New World," 510.

from Dutch Brazil. While Plumier could not help but indulge in the older tradition of the jigsaw animal description at first, describing it as looking like a composite of a rat, fox, monkey, and badger, his image is a far cry from the old *Simivulpa* construction, being readily recognizable as a real-life opossum (likely *Didelphis marsupialis*). Likewise, his written description is not copied from Marcgrave or any other previous authors, but rather is full of original – and generally scientifically accurate – observations.

While Plumier's opossum is clearly drawn "from life," is not depicted as actually alive, but rather as a specimen, preserved in the tradition of the paper zoo. Plumier's opossum is thus posed in such a way as to make visible each of the animal's notable morphological traits he describes in the accompanying text, including its delicate ears, prominent rows of teeth, thick scaly tail, five-toed feet (including an accurate rendering of its clawless hind "thumbs"), and of course, the pouch, spread open just enough to see the teats inside. Plumier also makes sure to note a few of its behavioral traits – the mother's constant carrying of its young, its propensity to kill livestock, and its relative slowness while on the ground versus its great agility in the trees. While Plumier likely observed living animals for himself, it is also likely that he drew upon local ethnozoological knowledge when recording these behaviors, especially given the fact he referenced its Indigenous name (a fact rarely mentioned in writings about Plumier's many "discoveries" of the Caribbean's native flora and fauna).

Merian "Rat de Forest" (c. 1699, published posthumously 1719)

Merian's image of a Murine Mouse Opossum (*Marmosa murina*, also known as Merian's Opossum) from Suriname (Fig. 13i) deviates from the above examples in that it does not apply an Indigenous name, nor does it directly cite Indigenous knowledge in the text. However, it has been well-documented that Merian did consult Indigenous sources – in fact, she even went so far

as to bring an Indigenous woman back with her to Amsterdam to help her complete the entries for her book *Metamorphosis insectorum Surinamensium* after illness forced her to return home.[136] It should thus be understood that her first-hand observations of Suriname wildlife, including this opossum family, were absolutely aided by Indigenous knowledge.

Merian's opossum is also unusual in that it appears to be the only mammal she ever depicted in her work. Merian mainly focused on small fauna, especially insects and their associated flora; furthermore, this plate was even not originally included in her published work, but rather was inserted into a posthumous edition. Could it have been that, as Sleigh suggests, Merian felt compelled to deviate from her usual subject matter and portray this particular mammal because of some affinity she felt with it as a strong, protective mother traveling through the forest with her own daughter? If she did wish to convey a more symbolic sense of opossum maternity, this could also help explain her choice to eschew a more scientifically-accurate portrayal of how the babies rode on their mother in favor of dabbling in some "nature-faking" to produce a more idealized image of the relationship.

However, it remains uncertain if this image was even the sole creation of Maria; Reitsma and Ulenberg instead refer to it as a creation of the Merian Studio, referencing the fact that illustrating was the family business, with both her daughters actively contributing to the creative output.[137] They report the opossum plate was one of several found in Maria's workshop after her death, and speculate that her older daughter Johanna may have had a heavy hand in some or all of them. It is also not clear where the accompanying text originated from; it may well have been

[136] Reitsma and Ulenberg, *Maria Sibylla Merian & Daughters*, 198, 205-6.

[137] Reitsma and Ulenberg, 240.

cobbled together by the publisher based on notes left behind, which could also explain why the Indigenous name was never given.[138]

As detailed by Hartman, this particular image and its little fiction of the babies' tails all neatly wrapped around the mother's erect tail would subsequently find its way into not only works of art such as Mazzesi's mosaic (Fig. 15d) but also in scientific works, with the fanciful depiction and description left intact and repeated as fact. Iterations of this image can be found in natural history and zoological texts all through the eighteenth, nineteenth, and even twentieth centuries (Fig. 16a), thus perpetuating the mistaken notion that opossum litters really did ride around on their mother's back in such an organized and secure fashion, rather than the more chaotic reality of babies clinging on to wherever they can (as seen in the family in Fig. 2).

The Disconnect Between Ex Situ European Science and In Situ Indigenous and Local Knowledge

The problem of European zoology's disconnect from Indigenous and local knowledge outside Europe goes back to the discipline's earliest pioneers such as Gessner and Ulisse Aldrovandi (1522-1605), who never traveled outside Europe and thus based their knowledge of "exotic" animals on a combination of second-hand reports, paper zoo and cabinet specimens, and the occasional live animal either obtained via trade or observed in a private menagerie. This is how the *Simivulpa* version of the opossum became the standard published image in the early animal encyclopedias, even while more scientifically accurate images were being produced by others who had had the benefit of seeing the animals for themselves in the Americas.

As the field of zoology continued to develop in the seventeenth and eighteenth centuries as a part of the "new science" of Europe, the problem of marsupial classification continued to perplex scientists, making access to opossum specimens valuable. While each of the previously

[138] Reitsma and Ulenberg do mention the Surinamese name is *Awari* on page 240, though it is not clear if this fact was taken from any of Merian's unpublished manuscripts or was simply supplied by the authors.

cited naturalists had actually travelled to the Americas and seen living specimens in their natural environments, these scientists mostly relied on *ex situ* study of preserved specimens, removed from both their original ecological and cultural contexts and recontextualized as raw physical data for advancing (European) science.

Tyson's Dissected Opossum Specimens (female published 1698, male published 1704)

Tyson published descriptions of his opossum dissections included highly-detailed scientific illustrations of their anatomy, including the respective reproductive systems (Fig. 14a). Thus, nearly two centuries after Europeans were first confronted with the existence of marsupials, their mysterious structures of the unique bifurcate reproductive organs and marsupium pouch were finally laid bare for all to see. Tyson's second paper also included an essay on the classification of terrestrial mammals, which Asúa and French suggest "[was] prompted by the difficulties of pinning down the opossum in the current taxonomic schemes."[139] It is further observed that the American animals figured prominently in this essay, and thus, "this is a telling example of how the[se] new animals stimulated the creation of new taxonomical schemes" – especially the opossum.[140]

While the collection, inspection, and dissection of specimens allowed European scientists to become intimately familiar with opossum morphology and anatomy, which subsequently informed their proper scientific classification under the new Linnean system, to fully understand their behavior and ecology still required observation of living animals in their natural environments. Indigenous American cultures obviously had millennia of data in their ethnozoological knowledge database; they had long known about not only both female and male

[139] Asúa and French, *A New World of Animals, 225*.

[140] Asúa and French, 225.

opossum physical features, but also the key features of their entire life history. Early European chroniclers of the Americas, such as those covered in this study, subsequently bolstered their short stints of *in situ* observation with gleaning of this Indigenous knowledge, resulting in a better understanding of opossums as living animals.

The Seba Opossum Specimens (published 1735)

In contrast, the opossum images in Seba's *Thesaurus*, rendered from lifeless specimens plucked from their native land and shipped across the ocean to be collected and displayed, suffered from a clear lack of such understanding. While the ability to observe preserved specimens up close allowed illustrators to render a high degree of morphological and anatomical accuracy, the absence of both first-hand live observation and Indigenous knowledge about the animals and their places of origin – combined with a clear motivation to display and emphasize the novel female marsupium – led to misattributed geographical origins, unnatural postures, and inaccurate coloration.[141] For example, the female opossum depicted in Plate 39 (Fig. 14b, bottom right) is shown sitting upright holding fruit, with marsupium fully open – a pose unlikely to ever happen in real life. Its plain brown coloring also lacks any defining pelage variations such as facial markings; also unique to this hand-colored copy, its nails have been painted to look like they have blue nail polish on them, an idiosyncratic artistic flourish with no basis in reality.

Still, Seba's opossum specimens would later be studied by Linnaeus as part of his landmark systematic classification of life, and as previously noted, Plate 39 still serves as an official type specimen. Furthermore, as with Merian's opossum, these illustrations were subsequently lifted for use in other texts, resulting in the odd depiction of female opossums as kangaroo-like bipedal creatures well into the nineteenth century (Fig. 16a). These scientifically

[141] The lack of some colorists' access to the original specimens was likely also a factor.

inaccurate images continued to circulate even as more Europeans permanently settled in the Americas and became familiar with the opossum's true living appearance and behavior for themselves, just as Indigenous Americans had long before them; and, as detailed by Parrish, there would soon be a new generation of colonial European-American naturalists who would begin to challenge the detached knowledge of the continental European establishment and call out these misrepresentations. Eventually, of course, more naturalistically rendered opossums would take their rightful place in the rich tradition of American wildlife art (Fig. 16b).[142]

[142] These opossums from John James Audubon's (1785-1851) *The Viviparous Quadrupeds of North America* (1845-8) are amongst the most famous. It should be noted that, like most of his images, they were likely rendered from already dead specimens; his innovation was to use a system of wires and pins to pose specimens in lifelike positions based upon observations of living animals. (He was also infamous for often eating them after and adding descriptions of their taste to the species account!)

Chapter 5: Suggestions for Further Study and Conclusion

There remains much work to be done with regards to recognizing and understanding historical opossum iconography on both sides of the Atlantic. This includes filling in knowledge gaps of other regional iconographies beyond the Mesoamerican and Andean realms where opossums are known to have cultural significance, especially in the Southeastern United States and Amazonia. Early Spanish colonial art also remains poorly studied, and, as evidenced by the murals of Malinalco and Casa del Deán, may be holding a wealth of native species iconography. Likewise, there may be unidentified opossums still lurking in the background of early modern European fine art, especially in Renaissance and Baroque depictions of courtly menageries and natural history cabinets and animal-centric scenes from Greco-Roman (e.g., Orpheus playing for the animals) and the Christian (e.g., the Garden of Eden and Noah's Ark) traditions. Lastly, there is a need to reassess previous taxa identifications in scholarship, especially with regards to the confusion and conflation of opossums and coatis in both Indigenous American and European visual records. This should include further research into clarifying the overlaps and distinctions in opossum and coati cultural significance and related iconography across the significant stretch of geography where the two animals are sympatric.

Of course, such research would serve an important purpose beyond just correcting museum records and identifications in scholarship; it would be part of the broader effort to recover the Indigenous ethnozoological knowledge lost in centuries of conquest and colonization. As discussed in this study, although some of this knowledge was undoubtedly permanently lost along with the scores of peoples who perished in the aftermath of European conquest, there remains much embedded in both the historical record (visual and textual) and in the collective cultural memory of the descendants of the survivors to be explored. In the case of

the latter, the visual record can help fill in important gaps in that memory, which in the case of the opossum, has led to a significant loss of cultural reverence in modern times. For example, as reported in a study of contemporary attitudes towards the opossum in the Mexico's Puebla Mixteca region, while the opossum's reputation as a trickster and thief remains well intact, the often-heroic contexts of these attributes from the old myths – the opossum tricked and stole to help humans! – have been largely forgotten.[143] This has left local communities to view wild opossums with varying degrees of indifference, fear, and disgust. And as further reported, this has led to persecution of local opossum populations, which, in turn, can have long-term ecological consequences. The study's authors thus argue that the recovery and revitalization of Indigenous cultural and ethnozoological knowledge can play a key role in conservation programs, especially in efforts to center Indigenous stakeholders as partners in the protection and recovery of local biodiversity – after all, their native fauna and flora suffered in tandem with the native human populations during centuries of European habitat destruction and wholesale exportation of nature.

To this end, there should be more joint consideration of pre-conquest Indigenous American and post-conquest Colonial and European visual records, as knowledge of the former can help inform efforts to recover Indigenous knowledge and history from the latter. As Olarte observes, there has been a conscious push in scholarship to employ a postcolonial lens to move away from old narratives about the "discovery" of America by Europeans, and instead seek a "symmetrical vision" which uses both European and Indigenous voices to frame it as an

[143] D. S. Estrada-Portillo, O. C. Rosas-Rosas, F. Parra-Inzunza, J. D. Guerrero-Rodríguez, and L. A. Tarango-Arámbula. "EL CARÁCTER SIMBÓLICO COMO FACTOR DE CONSERVACIÓN DEL COYOTE (Canis latrans Say) Y TLACUACHE (Didelphis virginiana Kerr) EN LA MIXTECA POBLANA, MÉXICO." *AGROProductividad* 11, no. 6 (2018), https://www.revista-agroproductividad.org/index.php/agroproductividad/article/view/434.

encounter of two worlds.[144] While Olarte readily acknowledges that "the history of the peoples of the Iberian Atlantic is a history of encounters, of cultural interaction, and the idea of hybrid or mestizo cultures is a reality in the history of the Atlantic world," he also questions if achieving a truly symmetrical narrative is possible, given the inherently unbalanced power dynamics of colonization: "this desired symmetry poses serious methodological and historiographical problems since native voices and perspectives, in most cases, can only be reconstructed through narratives or interpretations or, if you will, de-constructions of European narratives."[145]

The visual records of animals endemic to the Americas can provide a strong foundation upon which to build a more symmetrical narrative of cultural encounter, because a clear spatial and temporal point of contact can be established. Because Europeans would not have known of these animals prior their ability to cross the Atlantic, nor could they have influenced the production of their images by Indigenous Americans, a clear pre- versus post-contact lens to be applied to the visual records of each biogeocultural sphere. (Conversely, the same principle applies to animals not native to the Americas and thus unknown to Indigenous Americans prior to their importation by Europeans.) Such zoological images are especially relevant to the study of the Columbian exchange, as they are vital evidence in the quest to trace how both physical nature and ideas about the natural world were transported and transformed across the Atlantic.

In the case of the opossum, we find an animal which has both a rich pre-conquest cultural history in the Americas, and a uniquely influential post-conquest cultural history in Europe, making it an especially compelling iconographic case study. There is ample evidence to suggest

[144] Olarte, "Scientific Practices in the Sixteenth-Century Iberian Atlantic," 155.

[145] Olarte, 155. Olarte also observes another layer of asymmetry in the form of a longstanding scholarly neglect of the contributions of early Spanish and Portuguese colonial science to the development of modern science in Europe; as the earliest appropriators of Indigenous American knowledge, the understudy of these sources can impede the recognition of the contributions of Indigenous knowledge to the development of these sciences as well.

that many Indigenous American cultures across this animal's expansive range have been well familiar with them since their earliest times, including having intimate knowledge of their life history and unique marsupial traits, and that it is this reservoir of ethnozoological knowledge which inspired the multiplicity of qualities attributed to them in lore and prescribed to them in ritual and medicine – and, in at least some regions, their roles in visual culture. In those cultures where pre-conquest examples of opossum imagery survive, the visual record provides valuable supporting evidence for not only their multifaceted cultural significance, but also the depth and breadth of that underlying scientific knowledge. This, in turn, can support the assertion that, even in the face of rapid and widespread iconographic extinction following conquest and colonization, at least some Indigenous opossum iconography was preserved through its transfer into the nascent Colonial visual record via missionary projects illustrated by Indigenous artists, who used their agency to incorporate native animal imagery into these works.

Furthermore, the production of European images also greatly benefitted from tapping into this rich ethnozoological knowledge base. Indigenous knowledge can not only be found embedded in the early modern European visual record, but the discernable improvement this knowledge had on the scientific accuracy of these images can be cited as evidence of the still underappreciated influence the appropriation of this knowledge had on the development of modern zoological science. As Europeans tried to make sense of this strange new animal, with a wholly novel feature, connected to a previously unknown reproductive system, the combination of direct *in situ* observation and interaction with local Indigenous knowledge brought with it a new depth of understanding. For Europeans, the marsupials were an entirely new branch of the mammal tree to puzzle over, but for Indigenous Americans (and as Europeans would later find out, Australasians as well), they were one of its oldest and well-known roots.

Illustrations

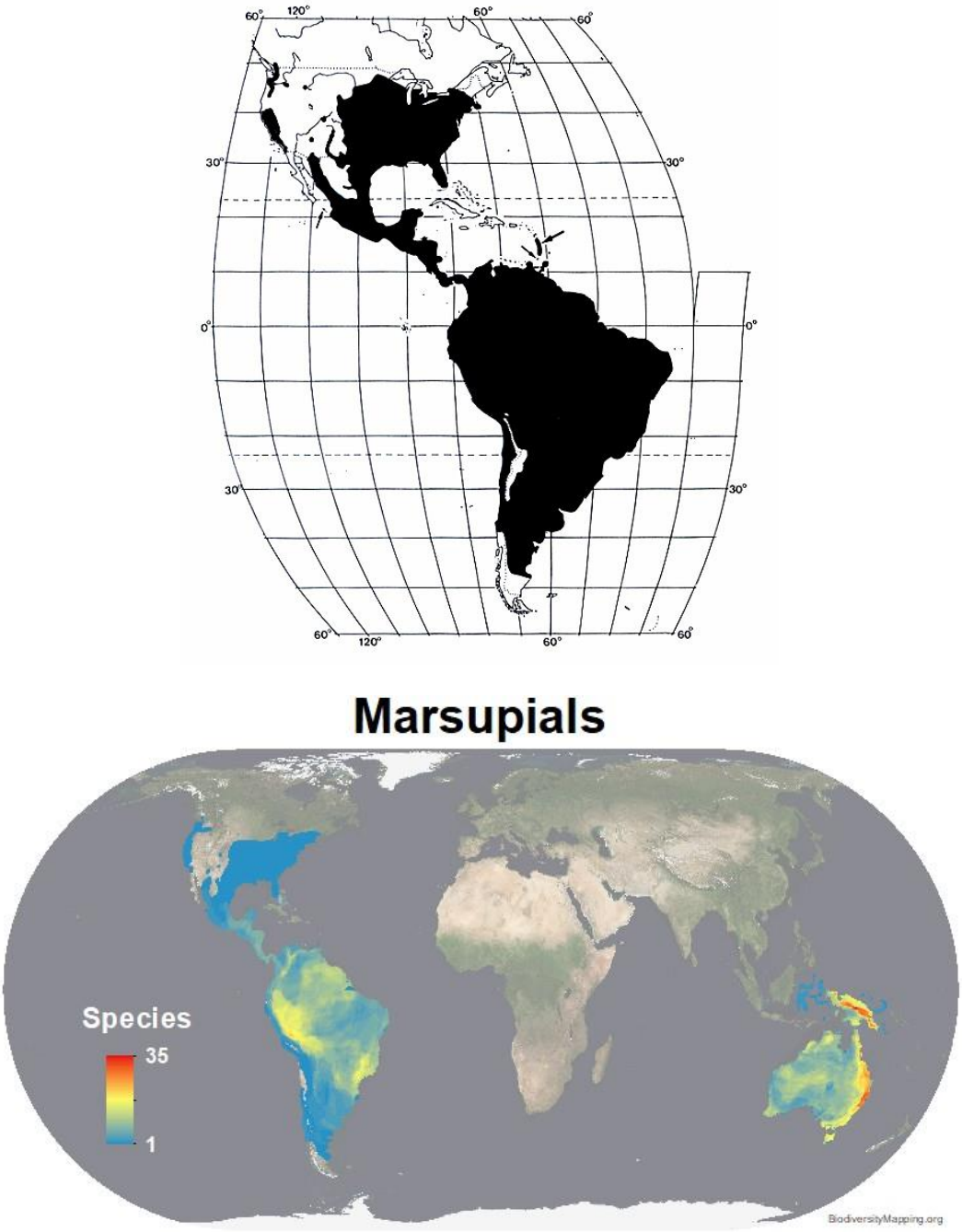

Fig. 1: Opossum Biogeography

Top map: range and distribution of Opossums (Order Didelphimorphia) in the Americas. http://people.wku.edu/charles.smith/faunmaps/Didelphinae.htm [Charles H. Smith/Educational Use]
Bottom map: global distribution of Marsupials (Infraclass Marsupialia). https://biodiversitymapping.org/index.php/mammals/ [BiodiversityMapping.org/Educational Use]

Fig. 2: Opossums of North America

Top: the eight native opossum species of Mexico.
[Infographic via INBio Costa Rica, for Educational Use]
Bottom: Virginia Opossum (*Didelphis virginiana*), the only species found north of Mexico, which also ranges as far south as Costa Rica.
https://mdc.mo.gov/discover-nature/field-guide/virginia-opossum [Jim Rathert/CC-0]
https://www.flickr.com/photos/hobbitstee/41082373671/ [Hobbitstee Wildlife Refuge/CC-BY-2.0]

a  b 

c 

Fig. 3: Coatis vs. Opossums

Fig. 3a: One of a collection of anonymous 18th century illustrations identified in their original album as peccaries, and by later by British Museum curatorial notes as "more likely some form of opossum," but which are actually coatis.
https://www.britishmuseum.org/collection/object/P_SL-5261-143 [British Museum/CC BY-NC-SA-4.0]

Fig. 3b: The White-nosed Coati (*Nasua narica*), the only coati species found north of South America. Key morphological differences in coatis versus opossums include the tail, which is furred, not prehensile, and often carried upright; the ears, which are smaller and rounder; and the snout, which is more elongated, flexible, and ends in an upturned, black nose. (Coatis also lack pouches, and do not carry their young on their backs.)
https://www.inaturalist.org/observations/92618489 [Alex Lamoreaux/CC-BY-NC]

Fig. 3c: Maya effigy vessel from Kaminaljuyu, Guatemala, Preclassic, c. 1000 BCE-250 CE. Featured in the 1998-1999 Exhibition *Maya* (Palazzo Grassi, Venice), exhibited alongside the vessel in Fig. 6e, with both identified in the official catalog as "a red coati or possum" (Schmidt, p. 519, 25); however, here there was a clear effort to distinguish it as a coati via the longer, narrower, upturned snout, and smaller, rounder ears.
https://www.facebook.com/munaegt/photos/5103614339658672/ [MUNAE/Educational Use]

Fig. 4: Earliest and Latest Known Examples of Opossums in Mesoamerican Codices

Fig. 4a: Opossum Mam in the *Dresden Codex*, Maya, c. 11th-12th century, p. 26. http://www.famsi.org/mayawriting/codices/pdf/3_dresden_fors_schele_pp25-35.pdf [FAMSI/CC-0]

Fig. 4b: Costumed character identified as an opossum (center) in procession with a bat (top) and coyote (bottom) in the *Codex Borbonicus*, Aztec, c. 1st quarter 1500s (previously classified as pre-conquest, but recent scholarship suggests very early post-conquest), p. 30. https://commons.wikimedia.org/wiki/File:Codex_Borbonicus_(p._30).jpg [Wikimedia Commons/CC-0]

CODEX	PAGE #
MAYA [PRE-CONQUEST]	
Dresden	7*, 25-28, 36, 51*, 55*, 56*, 60*
Madrid	24, 25, 87, 88, 90
Paris	2*, 3, 5*, 6*, 8, 10, 23*
MIXTEC [PRE-CONQUEST]	
Vindobonensis Mexicanus 1	13, 20
Zouche-Nutall	3, 76
AZTEC [PRE-CONQUEST]	
Borgia	59
Fejérváry-Mayer	30, 33, 38-43
Vaticanus B	9
AZTEC [POST-CONQUEST]	
Borbonicus	30

GLYPH ONLY

Fig. 5: Full List of Opossum Images Found in Mesoamerican Codices

[created by author]

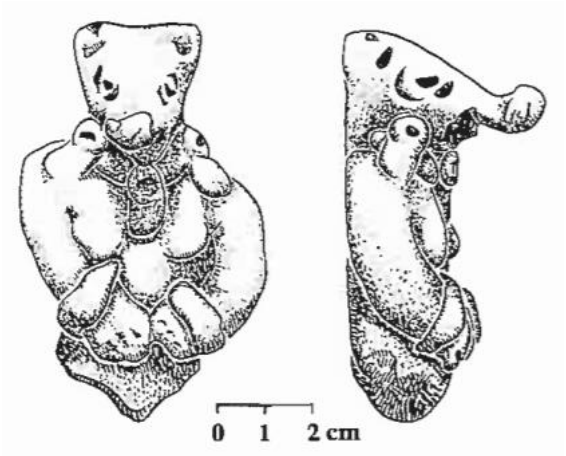

Figure 16.12. Animal figurine with opossum-like face and female human body.

a

b

c

d

e

f

Fig. 6: Opossums in Pre-conquest Mesoamerican Ceramics and Sculpture
(*see next page for labels*)

Fig. 6a: Figurine with an opossum face and pregnant female human body found at Chalcatzingo, Middle Formative, c. 1000-400 BCE; illustrated in Grove (1987) and cited by Olson (2007). http://www.famsi.org/research/grove/chalcatzingo/grove_ch16.pdf [Grove/Educational Use]

Fig. 6b: Ceramic rattle from Tlatelolco depicting a mother opossum with baby on back, Late Postclassic, c. 1454 CE; found in an offering basket buried with a ritually decapitated 3-year-old girl. https://www.researchgate.net/publication/329704246_Mexica_Textiles_Archaeological_Remains_from_the_Sacred_Precincts_of_Tenochtitlan_and_Tlatelolco/figures [Luján/Educational Use]

Fig. 6c: Zapotec "Opossum God" urn with two ears of corn, Monte Alban Epoch III-B, c. 500-1000 CE; originally cataloged in Caso & Bernal (1952) and currently in the MNA collection. https://www.flickr.com/photos/101561334@N08/9768138871/in/album-72157635553602941/ [Gary Todd/CC-0]

Fig. 6d: Zapotec "Opossum God" urn with *oyohualli* pendant and both opossum and earspool-adorned human pairs of ears from Miahuatlán, before 1521 (epoch undetermined); originally cataloged in Caso & Bernal (1952) and Boos (1966), current location unknown. https://pueblosoriginarios.com/textos/urnas/urnas-oaxaca.html [Caso & Bernal/Educational Use]

Fig. 6e: Tohil plumbate ware effigy vessel (found in a Maya grave), Terminal Classic - Early Postclassic, c. 800-1200 CE. Featured in the 1998-1999 Exhibition *Maya* (Palazzo Grassi, Venice), exhibited alongside the vessel in Fig. 3c, with both identified in the official catalog as "a red coati or possum" (Schmidt, p. 519, 26); however, here there was a clear effort to distinguish it as an opossum via the shorter, wider snout and larger, ovoid ears. Furthermore, it is adorned with an *oyohualli* pendant, and accessories similar to those found in Oaxaca "Opossum God" urns (including the extra pair of earspool-adorned human ears as seen in Fig. 6d). Plumbate ware was manufactured for regional trade, and a number of similar vessels of this same design are found in other collections, although they are almost always identified as a coati. However, Alfredo López Austin identifies it as an opossum in his book: see *Myths of the Opossum*, 326, Fig. 15b. https://www.lacma.org/sites/default/files/Children-of-the-Plumed-Serpent-image-sheet-3.26.12.pdf [LACMA/Educational Use]

Fig. 6f: Closeup of the jaw of a carved skull titled *El Señor Que se Marcha* (*The Lord Who Leaves*), Mixtec-Zapotec, Oaxaca-Puebla, c. 900-1521 CE. This piece was featured in the Casa del Medrugo's *Amos por Siempre: El Misterio De Los Craneos Zapotecas* exhibition, with the description "the carving on the jaw has the image of an opossum marsupial, which in Mixtec culture is related to death." https://www.youtube.com/watch?v=A1pQGCvhoFk [Museo Casa del Mendrugo/Educational Use]

Fig. 7: Opossums in Manteño-Huancavilca (Ecuador) Iconography

Fig. 7a: Opossum effigy vessel with the paws-to-snout gesture, c. 800-1530 CE; documented by both Usillos and Ugalde, last known location Museo del Banco Central, Quito. https://books.google.com/books?id=ykweCbmY-8gC [Usillos/Educational Use]

Fig. 7b: Spindle whorls with opossum designs, c. 800-1530 CE; illustrated in Wilbert. https://archive.org/details/wilbert-the-thread-of-life/page/83/mode/1up [Wilbert/CC-BY-NC-ND-4.0]

Fig. 8: Malinalco Opossum Candidates

Two animal figures in the paradise garden murals of Malinalco, c. 1535/1585, identified by Peterson as possible opossums:
Fig. 8a: The less likely of the two, may instead be an agouti or canine.
Fig. 8b: The more likely of the two based on morphology and size (see analysis).
Mural photos: https://www.flickr.com/photos/eltb/albums/72157629114034706/page2
[Catedrales e Iglesias / CC-BY-2.0]
Figure photos:
https://ombligomx.org/2020/02/17/fauna-prehispanica-en-los-murales-del-convento-de-malinalco/
[OmbligoMx / CC-BY-NC-2.5-MX]

a

b

Fig. 9: Casa del Deán Opossum Candidates
(see next page for labels)

Animal emblems in the *Salon of the Triumphs* murals of Casa del Deán, c. 1584:

Fig. 9a: Animal from "The Triumph of Eternity;" identified by Morrill as an opossum, but questionable.
Fig. 9b: Animal from "The Triumph of Death" (shown before and after 2010 restoration); identified by Morrill as a coati, but more likely an opossum (see analysis).
Mural photos:
http://mexicosmurals.blogspot.com/2020/04/puebla-la-casa-del-dean-muralsthe.html
http://mexicosmurals.blogspot.com/2020/04/puebla-la-casa-del-dean-muralsthe_13.html
[Juan Carlos Varillas & Niccolo Brooker/Educational Use]
Figure photos: from Morrill (1987), pp. 183, 185, 187 [Morrill / Educational Use]

a

b

Fig. 10: *Florentine Codex* Opossums

Tlaquatl (opossum) illustrations in the *Florentine Codex*, Book XI (*Earthly Things*), c. 1540/1585:
Fig. 10a: male
Fig. 10b: female with young in pouch
http://teca.bmlonline.it/ImageViewer/servlet/ImageViewer?idr=TECA0001504065&keyworks=Bernardino%20de [BML/CC-0]

a 

b 

c 

Fig. 11: The First European Image (*Simivulpa*)
(see next page for details)

Fig. 11a: Map icon from Waldseemüller's *Carta Marina Navigatoria*, 1516, the earliest known European opossum image.
https://artsandculture.google.com/asset/marine-navigation-chart-carta-marina-navigatoria-mart%C3%ADn-waldseem%C3%BCller/0QGgr-F52ltotw
[Biblioteca del Instituto Geográfico Nacional/CC-BY-4.0-IGN.ES]

Fig. 11b: An iteration of Waldseemüller's image used to illustrate the opossum in Gessner's *Historia animalium*, 1551. It was the only one of the newly reported American animals included in the first edition, and he gave it the name *Simivulpa* ("ape-fox").
https://www.loc.gov/resource/rbctos.2017gen04347v1/?sp=1027&r=-0.731,0.576,2.463,0.932,0
[LOC/CC-0]

Fig. 11c: Illustrated plate depicting the story of Pinzón's men capturing an opossum family (modeled after the *Simivulpa* image) while exploring Brazil in 1500, from Ogilby's *America*, 1671.
https://digitalcollections.nypl.org/items/82e68640-c5d4-012f-5fa2-58d385a7bc34/book#page/11/mode/2up [NYPL/CC-0]

a **b** **c**

Fig. 12: Other Strange Pouched Beasts (European Misinterpretations of the Marsupium)

Fig. 12a: "Americca," from Deluane's *The Four Quarters of the World*, 1575. https://www.nga.gov/collection/art-object-page.47807.html [NGA/CC-0]

Fig. 12b: Title page detail from de Jode's *Speculum orbis terrae*, BGE Fa 164, 1593. http://institutions.ville-geneve.ch/en/bibliotheque-de-geneve/collections/rare-books/strong-points/ [BGE/CC-0]

Fig. 12c: Detail from Villamena's "Thesis print of Don Fernando Fernandez de Cordoba for his philosophy defense at the Collegio Romano," 1602. https://brill.com/view/book/edcoll/9789047408741/B9789047408741-s017.xml [Rice/Educational Use]

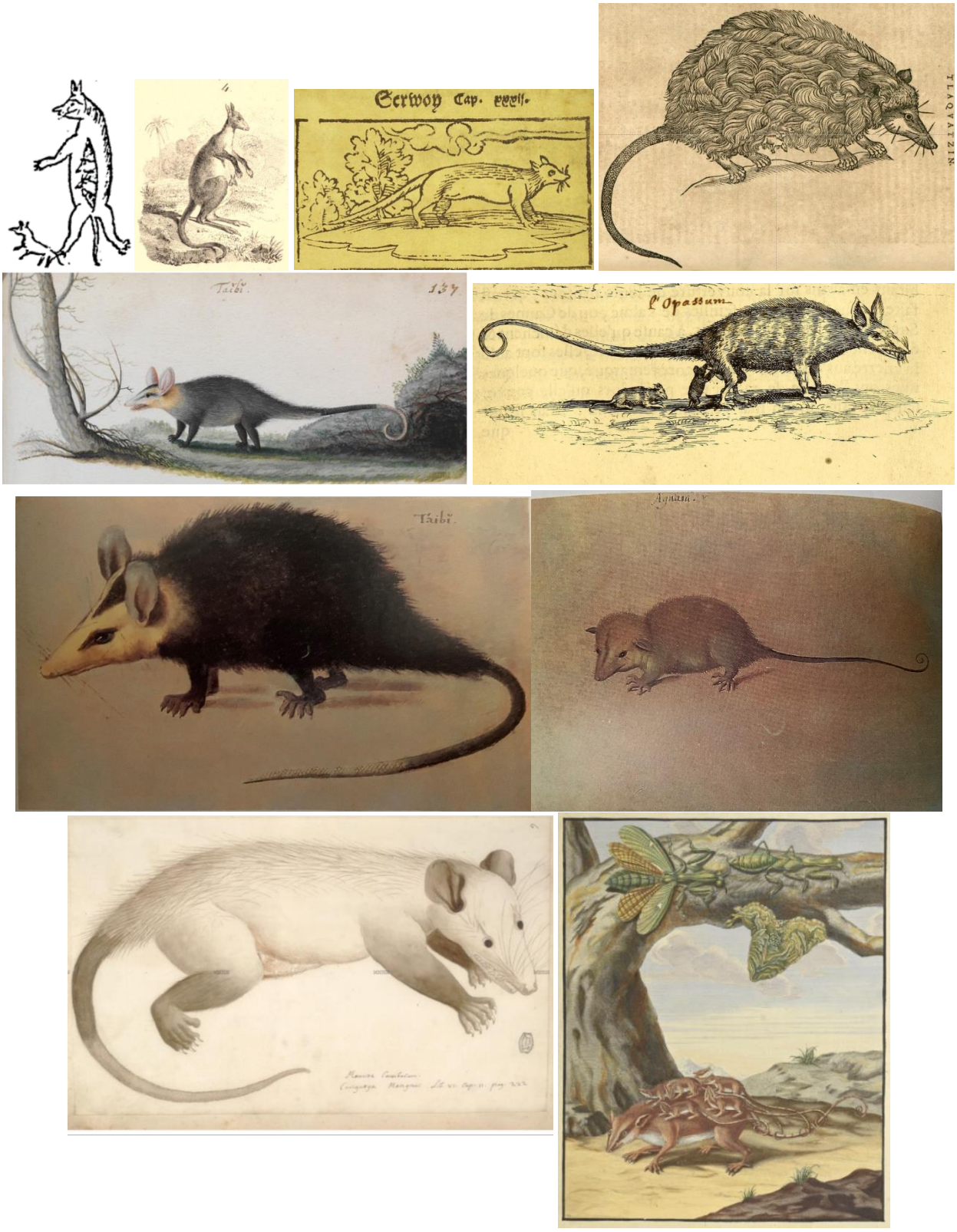

Fig. 13: Early Modern European Images Based on First-hand *In Situ* Observation and Application of Indigenous Knowledge *(see next page for labels)*

Fig. 13a: (L) *Churcha* (opossum) by Fernández de Oviedo, unpublished sketch for *Historia general y natural de las Indias* (first published 1535), as copied into the eighteenth-century "Muñoz Manuscripts." [RAH Madrid/Educational Use]
(R) The stock image of an Australian kangaroo used to represent the American opossum in the nineteenth century illustrated Ríos edition.
https://www.biodiversitylibrary.org/item/57174#page/759/mode/1up [BHL/CC-0]

Fig. 13b: *Serwoy* (opossum) woodcut illustration in Staden's *Warhaftige Historia*, 1557.
https://archive.org/details/staden/page/n175/mode/2up [Archive.org/CC-0]

Fig. 13c: *Tlaquatzin* (opossum, possibly *Caluromys* spp.) woodcut illustration in Nieremberg's *Historia naturae*, 1635.
https://www.loc.gov/exhibits/exploring-the-early-americas/interactives/historia-naturae/3.html [LOC/CC-0]

Fig. 13d: *Taibi/Carigueya* (likely White-eared Opossum, *Didelphis albiventris*) watercolor from the Dutch Brazil court attributed to Marcgrave in *Libri Principis*, 1637/1644.
https://repositorio.ufba.br/handle/ri/32344

Fig. 13e: *Opassum* (opossum) woodcut illustration in Rochefort's *Histoire naturelle et morale des iles Antilles de l'Amerique*, 1658, the earliest illustration found using the now-standard English name *Opossum* (derived from Powhatan); this image was copied from Marcgrave and Piso's book, which in turn was an iteration of Marcgrave's original watercolor (Fig 13d).
https://www.biodiversitylibrary.org/item/124496#page/145/mode/1up [BHL/CC-0]

Fig. 13f: *Taibi* (likely White-eared Opossum, *Didelphis albiventris*) painting from the Dutch Brazil court attributed to Eckhout in *Theatrum* (1637/1644).
[Image from 1995 facsimile collection, *Brasil-Holandês / Dutch-Brazil* – Educational Use]

Fig. 13g: *Aguaja* (likely Bare-tailed Woolly Opossum *Caluromys philander*) drawing from the Dutch Brazil court attributed to Eckhout in *Theatrum*, 1637/44.
[Image from 1995 facsimile collection, *Brasil-Holandês / Dutch-Brazil* – Educational Use]

Fig. 13h: *Manicou* (likely Common Opossum, *Didelphis marsupialis*) drawing by Plumier from an unpublished manuscript, BNF Plumier MS 27, c. 1690.
https://bibliotheques.mnhn.fr/EXPLOITATION/infodoc/digitalCollections/viewerpopup.aspx?seid=MNHN_MS27 [BNF/CC-0]

Fig. 13i: "Rat de Forest" (Murine Mouse Opossum, *Marmosa murina*) family, detail from plate 66 of Merian's *Metamorphosis insectorum Surinamensium*, posthumous 1719 edition.
https://www.biodiversitylibrary.org/item/278206#page/209/mode/1up [BHL/CC-0]

Fig. 14: Early Modern European Images of *Ex Situ* Opossum Specimens
(see next page for labels)

Fig. 14a: Tyson's images of female and male Virginia Opossum (*Didelphis virginiana*) dissections for the Royal Society of London, the first published scientific illustrations of their anatomy, 1698 and 1704.
https://royalsocietypublishing.org/doi/10.1098/rstl.1698.0023
https://royalsocietypublishing.org/doi/10.1098/rstl.1704.0014
[Royal Society/Educational Use]

Fig. 14b: Seba's opossum specimens illustrated in Tabs. 31, 36, 38, and 39 of *Thesaurus*, Vol. 1, 1735.
https://www.biodiversitylibrary.org/item/127667 [BHL/CC-0]

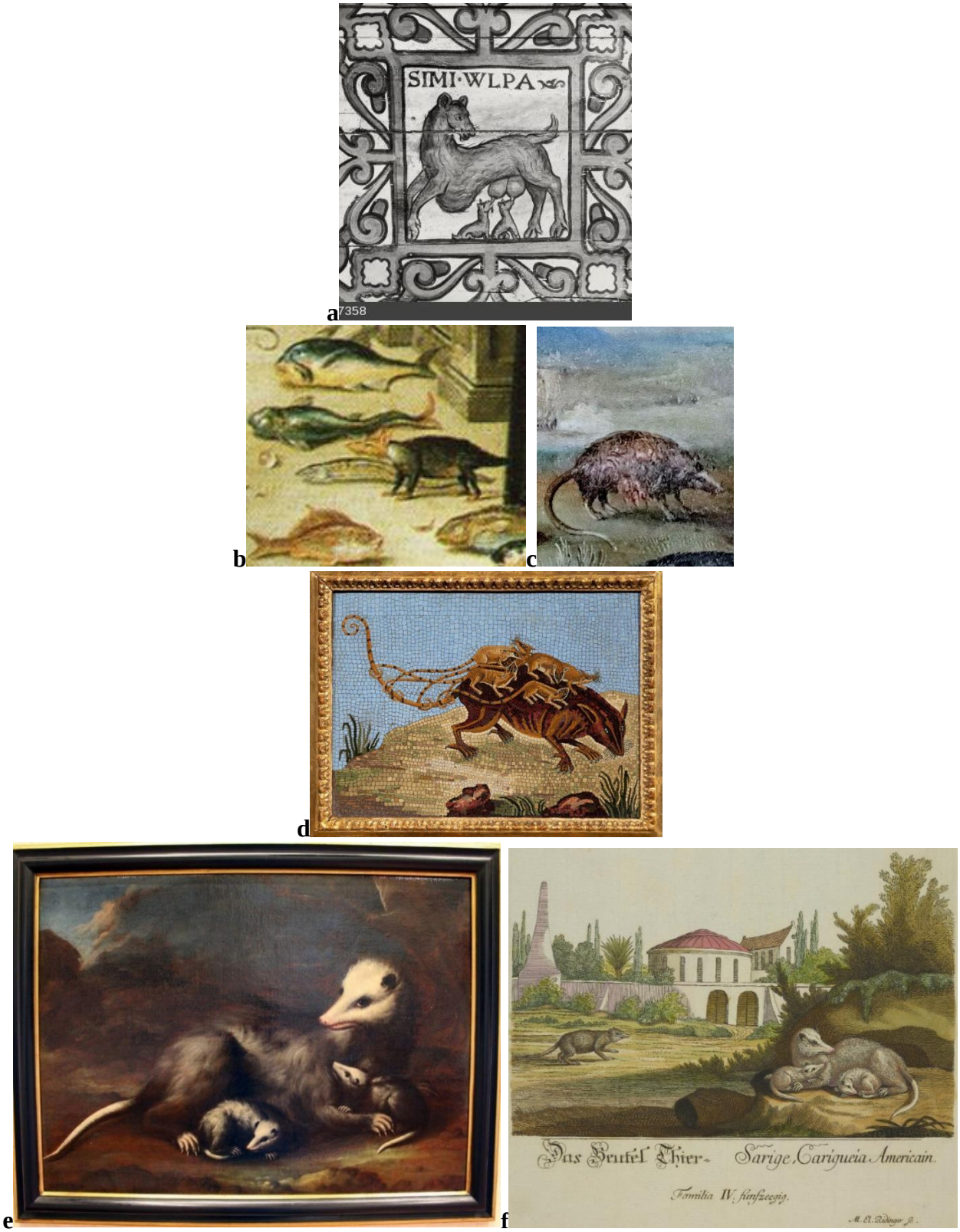

Fig. 15: Opossums in Early Modern European Art ***(see next page for labels)***

Fig. 15a: *Simivulpa* found on the Long Gallery ceiling in Earlshall Castle, Scotland, 1620; this figure was copied from Topsell's *The History of Four-footed Beasts*, 1607, which was taken from Gessner, which in turn was taken from Waldseemüller.
https://canmore.org.uk/collection/2107358 [HES/Educational Use]

Fig. 15b: Opossum in Kessel's *The Four Continents: America*, 1666, based on Marcgrave's opossum.
https://www.pubhist.com/w8548 [PubHist/CC-0]

Fig. 15c: Opossum in Kessel's *The Four Continents: Asia*, 1666, based on Nieremberg's opossum.
https://www.flickr.com/photos/mazanto/47949147623/in/album-72157631304799244/
[Jean Louis Mazieres/CC-BY-NC-SA-2.0]

Fig. 15d: Micromosaic plaque of an opossum family by Mazzesi, 1797, based on Merian's opossums.
https://www.artsy.net/artwork/andrea-mazzesi-micromosaic-plaque-depicting-a-family-of-philander-opossum [Alessandra Di Castro/Educational Use]

Fig 15e: Virginia Opossum family, portrait in the Medici collection by Bimbi, c. 1670-1729.
https://commons.wikimedia.org/wiki/File:Bartolomeo_bimbi,_opossum_con_due_piccoli.JPG
[Wikimedia Commons/CC-BY-SA-3.0]

Fig 15f: Virginia Opossum family, plate from the Ridingers' *Das in Seiner Grossen Mannigfaltigkeit Und in Seinen Schönen Farben Nach Original-Zeichnungen Geschilderte Thier-Reich*, 1768; this image appears similar to Bimbi's earlier composition, suggesting either that Bimbi's was an original image that was copied by Ridinger, or both artists copied an earlier still-unaccounted for image.
https://polona.pl/item/mabsupiale-americanum-oder-carigueya-das-beutel-thier,MzE1OTExNzc/0/#info:metadata [Polona/CC-0]

Fig. 16: Nineteenth Century Derived Vs. Original Opossum Images

Fig. 16a: "Quadrupedes A Os Marsupiaux," Plate Mammiferes 17 in Orbigny's *Dictionnaire universel d'histoire naturelle*, 1841, an example of a European nineteenth century natural history text still using Seba's (top) and Merian's (bottom) images.
https://www.biodiversitylibrary.org/item/275639#page/101/mode/1up [BHL/CC-0]

Fig. 16b: "Virginia Opossum," Plate LXVI of Audubon's *The Viviparous Quadrupeds of North America*, 1845-1848, an American nineteenth century natural history text with original, observation-based illustrations.
https://www.biodiversitylibrary.org/item/108514#page/145/mode/1up [BHL/CC-0]

Bibliography

Arredondo, Jaime Marroquín, and Ralph Bauer, eds. *Translating Nature: Cross-cultural Histories of Early Modern Science*. Philadelphia: University of Pennsylvania Press, 2019.

Arroyo, Salvador Guilliem. "Figurillas de Tlatelolco." *Arqueología* 17 (1997): 111-138.

Ashworth, William. "Emblematic Natural History of the Renaissance." In *Cultures of Natural History*, edited by N. Nardine, J.A. Secord, and E.C. Spary, 17-37. Cambridge: Cambridge University Press, 1.996.

Bassie, Karen. "Maya Creator Gods" Mesoweb, 2002. https://www.mesoweb.com/features/bassie/CreatorGods/CreatorGods.pdf. Accessed April 30, 2022.

Bath, Michael. *Renaissance Decorative Painting in Scotland*. Edinburgh: National Museums of Scotland Pub., 2003.

Benson, Elizabeth P. *Birds and Beasts of Ancient Latin America*. Gainesville: University Press of Florida, 1997.

Betancourt, Yuri Escalante. "El *Ahuítzotl*. Animal Asesino del Agua." *Arqueología Mexicana* VI, no. 35 (Enro-Febrero 1999): 57-61.

Bleichmar, Daniela, Paula De Vos, Kristin Huffine, and Kevin Sheehan, eds. *Science in the Spanish and Portuguese Empires, 1500–1800*. Stanford: Stanford University Press, 2008.

Bleichmar, Daniela, and Peter C. Mancall, eds, *Collecting Across Cultures: Material Exchanges in the Early Modern Atlantic World*. Philadelphia: University of Pennsylvania Press, 2011.

Boeseman, M., L.B. Holthuis, M.S. Hoogmoed, and C. Smeenk. "Seventeenth Century Drawings of Brazilian Animals in Leningrad." *Zoologische Verhandelingen* 267, no. 28.xii (1990): 1-189, figs. 1-43. ISSN 0024-1652. Seventeenth-century-drawings-of-Brazilian-animals-in-Leningrad.pdf (researchgate.net). Accessed April 30, 2022.

Boone, Elizabeth Hill. "Pictorial Documents and Visual Thinking in Postconquest Mexico." In *Native Traditions in the Postconquest World: A Symposium at Dumbarton Oaks, 2nd through 4th October 1992*, edited by Elizabeth Hill Boone and Tom Cummins, 149-99. Washington, D.C.: Dumbarton Oaks, 1998.

Boos, F. H. *The Ceramic Sculptures of Ancient Oaxaca*. New York: A. S. Barnes & Co., 1966.

Boot, Erik. "At the Court of Itzam Nah Yax Kokaj Mut: Preliminary Iconographic and Epigraphic Analysis of a Late Classic Vessel." Maya Vase Database, 2008. http://www.mayavase.com/God-D-Court-Vessel.pdf. Accessed April 30, 2022.

Brienen, Rebecca P. "From Brazil to Europe: The Zoological Drawings of Albert Eckhout and Georg Marcgraf." In *Early Modern Zoology: The Construction of Animals in Science, Literature and the Visual Arts*, edited by Karl AE Enenkel and Paul J. Smith, 273-314. Leiden: Brill, 2007.

Brylak, Agnieszka. "Truhanería y Sexualidad: Techalotl Entre los Nahuas Prehispánicos." *Itinerarios: Revista de Estudios Lingüisticos, Literarios, Históricos y Antropológicos* 21 (2015): 57-78. ISSN 1507-7241.

Cadena, A., and Jean-François Bouchard. "Las Figurillas Zoomorfas de Cerámica del Litoral Pacífico Ecuatorial." *Bulletin de l'Institut Français d'Etudes Andines Lima* 9, no. 3-4 (1980): 49-68. http://www.ifea.org.pe/libreria/bulletin/1980/pdf/49.pdf. Accessed April 30, 2022.

Capanna, Ernesto. "South American Mammal Diversity and Hernandez's Novae Hispaniae Thesaurus." *Rendiconti Lincei* 20 (2009): 39–60. https://doi.org/10.1007/s12210-009-0003-6.

Carballo, David M. *Urbanization and Religion in Ancient Central Mexico*. Oxford: Oxford University Press, 2016.

Caso, Alfonso, and Ignacio Bernal. *Urnas de Oaxaca*. Durango: Instituto Nacional de Antropología e Historia, 1952.

Castro, Alessandra Di. *Micromosaic Plaque Depicting a Family of Philander Opossum*, 1797. Micromosaic, 7 9/10 × 10 1/5 in (20 × 26 cm). Artsy [online database]. https://www.artsy.net/artwork/andrea-mazzesi-micromosaic-plaque-depicting-a-family-of-philander-opossum. Accessed April 30, 2022.

Czitrom, Carolyn Baus. "Significance of the Opossum in the Mesoamerica World." In *The Symbolism in the Plastic and Pictorial Representations of Ancient Mexico: A Symposium of the 46th International Congress of Americanists, Amsterdam 1988*, edited by Jacqueline de Durand-Forest and Marc Eisinger, 319-338. Bonn: Holos, 1993.

De Asúa, Miguel, and Roger French. *A New World of Animals: Early Modern Europeans on the Creatures of Iberian America*. London and New York: Routledge, 2017.

Dean, Carolyn, and Dana Leibsohn. "Hybridity and its Discontents: Considering Visual Culture in Colonial Spanish America." *Colonial Latin American Review* 12, no. 1 (2003): 5-35. http://dx.doi.org/10.1080/10609160302341.

Dias, Cayo Augusto Rocha, Guilherme Siniciato Terra Garbino, and Fernando Araújo Perini. "On the Identity of *Didelphis marsupialis* Linnaeus 1758." *Mammalia* 82, no. 6 (2018): 626-631. https://doi.org/10.1515/mammalia-2017-0137.

Dibble, Charles, and J. O. Anderson. *Florentine Codex. Book 11: Earthly Things*. Salt Lake City: The University of Utah Press, 1981.

Dickenson, Victoria. “Emblematic Animals.” In *Drawn from Life: Science and Art in the Portrayal of the New World*, 19-44. Toronto: University of Toronto Press, 1998.

Eastman, Charles R. "Beginnings of American Natural History." *The American Museum Journal* 15 (1915): 349-355. https://www.google.com/books/edition/The_American_Museum_Journal/qolPAAAAYAAJ. Accessed April 30, 2022.

Eastman, Charles R. "Early Portrayals of the Opossum." *The American Naturalist* 49, no. 586 (1915): 585-594. https://www.jstor.org/stable/2456226.

Enenkel, Karl AE. "Camerarius’s Quadrupeds (1595): A Plinius Emblematicus as a Mirror of Princes." In *Emblems and the Natural World*, edited by Karl AE Enenkel and Paul J. Smith, 91-148. Leiden: Brill, 2017.

Enenkel, Karl AE. "The Species and Beyond: Classification and the Place of Hybrids in Early Modern Zoology." In *Zoology in Early Modern Culture: Intersections of Science, Theology, Philology, and Political and Religious Education*, edited by Karl AE Enenkel and Paul J. Smith, 57-148. Leiden: Brill, 2014.

Enenkel, Karl AE, and Paul J. Smith. “Zoology and the Arts.” in *Early Modern Zoology: The Construction of Animals in Science, Literature and the Visual Arts*, 7-12. Leiden: Brill, 2007.

Estrada-Portillo, D. S., O. C. Rosas-Rosas, F. Parra-Inzunza, J. D. Guerrero-Rodríguez, and L. A. Tarango-Arámbula. "EL CARÁCTER SIMBÓLICO COMO FACTOR DE CONSERVACIÓN DEL COYOTE (Canis latrans Say) Y TLACUACHE (Didelphis virginiana Kerr) EN LA MIXTECA POBLANA, MÉXICO." *AGROProductividad* 11, no. 6 (2018). https://www.revista-agroproductividad.org/index.php/agroproductividad/article/view/434. Accessed April 30, 2022.

Feijó, Anderson, and Robert S. Voss. "A Neotype for *Didelphis marsupialis* Linnaeus, 1758." *American Museum Novitates* 2019, no. 3923 (2019): 1-12. https://doi.org/10.1206/3923.1.

Ferrão, Cristina, and José Paulo Monteiro Soares. *Brasil-Holandês / Dutch-Brazil*, 5 vols. Rio de Janeiro: Editora Index, 1995.

Ferro, Gaetano, Luisa Faldini, Marica Milanesi, and Gianni Eugenio Viola. *Columbian Iconography*. Translated by Luciano F. Farina and Carla Onorato Wysokinski. Rome: Istituto Poligrafico e Zecca Dello Stato, Libreria Dello Stato, 1996.

Forde, Jamie E. "The Polychrome Ceramics of Tututepec (Yucu Dzaa), Oaxaca, Mexico: Iconography and Ideology." *Ancient Mesoamerica* 27, no. 2 (2016): 389-404. Doi:10.1017/S0956536116000213.

George, Wilma. *Animals and Maps*. Berkeley: University of California Press, 1969.

George, Wilma. "Sources and Background to Discoveries of New Animals in the Sixteenth and Seventeenth Centuries." *History of Science* 18, no. 2 (1980): 79-104. https://doi.org/10.1177/007327538001800201.

Goodrich, Thomas D. *The Ottoman Turks and the New World: A Study of Tarih-i Hind-i Garbi and Sixteenth-Century Ottoman Americana*. Wiesbadem: O. Harrassowitz, 1990.

Grove, David C., ed. *Ancient Chalcatzingo*. Austin: University of Texas Press, 1987.

Gurgel-Filho, Newton M., Anderson Feijo, and Alfredo Langguth. "Pequenos Mamíferos do Ceará (Marsupiais, Morcegos e Roedores Sigmodontíneos) com Discussão Taxonômica de Algumas Espécies." *Revista Nordestina de Biologia* 23, no. 2 (2015): 3-150. ISSN - 2236-1480. https://periodicos.ufpb.br/ojs/index.php/revnebio/article/view/25904. Accessed April 30, 2022.

Hartman, Carl G. *Possums.* Austin: University of Texas Press, 1952.

Honour, Hugh. *The New Golden Land: European Images of America from the Discoveries to the Present Time*. New York: Pantheon Books, 1975.

Keating, Jessica. "Metamorphosis at the Mughal Court." *Art History* 38, no. 4 (2015): 732-747. DOI: 10.1111/1467-8365.12178.

Kerpel, Diana Magaloni. *The Colors of the New World: Artists, Materials, and the Creation of the Florentine Codex*. Los Angeles: Getty Publications, 2014.

Lévi-Strauss, Claude. “The Opossum’s Cantata.” In *The Raw and the Cooked: Mythologiques, Volume 1*, 164-98. New York: Harper & Row, 1969.

Leu, Urs B. "Konrad Gessner und die Neue Welt." *Gesnerus* 49, no. 3-4 (1992): 279-309. https://doi.org/10.1163/22977953-0490304002.

Lind, Michael D. "Cholula and Mixteca Polychromes: Two Mixteca-Puebla Regional Sub-styles." In *Mixteca-Puebla: Discoveries and Research in Mesoamerican Art and Archaeology*, edited by H. B. Nicholson and E. Quinones-Keber, 79-99. Culver City: Labyrinthos, 1994.

López Austin, Alfredo. *The Myths of the Opossum: Pathways of Mesoamerican Mythology*. Translated by Thelma and Bernard Ortiz de Montellano. Albuquerque: University of New Mexico Press, 2011.

Luján, Leonardo López, and Salvador Guilliem Arroyo, "Mexica Textiles: Archaeological Remains from the Sacred Precincts of Tenochtitlan and Tlatelolco," In *PreColumbian Textile Conference VII / Jornadas de Textiles PreColombinos VII,* edited by Lena Bjerregaard and Ann Peters, 141-161. Lincoln, NE: Zea Books, 2017.

McKeever, Jill Leslie. *Codex Vindobonensis Mexicanus I: A Commentary*. Albany: Institute for Mesoamerican Studies, SUNY Albany, 1978.

Mancall, Peter C. *Nature and Culture in the Early Modern Atlantic*. Philadelphia: University of Pennsylvania Press, 2018.

Marcaida, José Ramón. "Juan Eusebio Nieremberg y la ciencia del Barroco. Conocimiento y representación de la naturaleza en la España del siglo XVII." PhD diss., Universidad Autónoma de Madrid, 2011. https://repositorio.uam.es/handle/10486/7757.

Marcaida, José Ramón. “Opossum.” In *New World Objects of Knowledge: A Cabinet of Curiosities*, edited by Mark Thurner and Juan Pimentel, 183–86. University of London Press, 2021. http://www.jstor.org/stable/j.ctv1vbd275.30.

Martyr d'Anghiera, Peter. *De Orbe Novo*. Translated by Francis Augustus MacNutt. New York: Putnam, 1912. https://www.gutenberg.org/files/12425/12425-h/12425-h.htm. Accessed April 29, 2022.

Mason, Peter. *Before Disenchantment: Images of Exotic Animals and Plants in the Early Modern World*. London: Reaktion Books, 2009.

McDavitt, Matthew. “Water-dog Detective.” Mexicolore, April 6, 2010. https://www.mexicolore.co.uk/aztecs/aztefacts/water-dog-detective. Accessed April 30, 2022.

Milbrath, Susan, Carlos Peraza Lope, and James John Aimers. "Mayapan’s Chen Mul Modeled Effigy Censers: Iconography and Archaeological Context." In *Ancient Maya Pottery: Classification, Analysis, and Interpretation*, edited by James John Aimers, 203-28. Gainesville: University Press of Florida, 2013.

Morrill, Penny C. *The Casa del Deán: New World Imagery in a Sixteenth-century Mexican Mural Cycle*. Austin: University of Texas Press, 2014.

Mosco, Mrilena. *Natura viva in Casa Medici: Animal Paintings in the Medici Collection [New Edition for the National Academy of Design, New York, July 3 – September 10, 1986]*. Florence: Centro Di/Stiav spa, 1986.

Moser, Christopher L. "Human Decapitation in Ancient Mesoamerica." *Studies in Pre-Columbian Art and Archaeology* 11 (1973): 1-72. https://www.jstor.org/stable/41263421.

Munn, Henry. "The Opossum in Mesoamerican Mythology." *Journal of Latin American Lore* 10, no. 1 (1984): 23-61. ISSN 0360-1927.

Müsch, Irmgard, Jes Rust, and Rainer Willmann, eds. *Cabinet of Natural Curiosities: Locupletissimi Rerum Naturalium Thesauri 1734-1765: Based on the Copy in the Koninklijke Bibliotheek, The Hague.* Multilingual ed. Cologne: Taschen, 2011.

Nicholson, Henry B., and Eloise Quiñones Keber. *Art of Aztec Mexico: Treasures of Tenochtitlan*. Washington, D.C.: National Gallery of Art, 1983.

Nowak, Ronald M. *Walker's Mammals of the World: Monotremes, Marsupials, Afrotherians, Xenarthrans, and Sundatherians*. Baltimore: JHU Press, 2018.

Ogilby, John. *America: Being the Latest, and Most Accurate Description of the New World.* London, 1671. https://quod.lib.umich.edu/e/eebo2/A53222.0001.001/1:5.3.3?rgn=div3;view=fulltext. Accessed April 30, 2022.

Olarte, Mauricio Nieto. "Scientific Practices in the Sixteenth-Century Iberian Atlantic." In *Theorising the Ibero--American Atlantic*, edited by Harald E. Braun and Lisa Vollendorf, 141-58. Leiden: Brill, 2013.

Olson, Jan. "A Socioeconomic Interpretation of Figurine Assemblages from Late Postclassic Morelos, Mexico." In *Commoner Ritual and Ideology in Ancient Mesoamerica*, edited by Nancy Gonlin and Jon C. Lohse, 251-79. Boulder: University Press of Colorado, 2007.

Paris, Elizabeth H., Eric Taladoire, and Thomas A. Lee Whiting. "Return to Moxviquil: Form and Function in a Small Maya City." *Ancient Mesoamerica* 26, no. 1 (2015): 81-112. DOI: 10.1017/S0956536115000048.

Parrish, Susan Scott. *American Curiosity: Cultures of Natural History in the Colonial British Atlantic World*. Raleigh: UNC Press Books, 2012.

Parrish, Susan Scott. "The Female Opossum and the Nature of the New World." *The William and Mary Quarterly* 54, no. 3 (1997): 475-514. http://www.jstor.org/stable/2953837.

Peterson, Jeanette Favrot. *The Paradise Garden Murals of Malinalco: Utopia and Empire in Sixteenth-century Mexico*. Austin: University of Texas Press, 1993.

Peterson, Jeanette Favrot Peterson, and Kevin Trerraciano, eds. *The Florentine Codex: An Encyclopedia of the Nahua World in Sixteenth-century Mexico*. Austin: University of Texas Press, 2019.

Pietsch, Theodore W. "Charles Plumier's ‘Manicou Caraibarum’ (c. 1690): A Previously Unpublished Description and Drawing of the Common Opossum, *Didelphis marsupialis* Linnaeus, 1758." *Archives of Natural History* 38, no. 1 (2011): 77-87. https://doi.org/10.3366/anh.2011.0006.

Plumb, Christopher. "Exotic Animals in Eighteenth-century Britain." PhD diss., University of Manchester, 2010. https://www.research.manchester.ac.uk/portal/en/theses/exotic-animals-in-eighteenthcentury-britain(efdb1f85-57db-4934-9930-08e7bc5a3e94).html. Accessed April 30, 2022.

Reitsma, Ella, and Sandrine A. Ulenberg. *Maria Sibylla Merian & Daughters: Women of Art and Science*. Amsterdam: Rembrandt House Museum, 2008.

Rice, Louise. "Villamena's Kangaroo." In *Humanism and Creativity in the Renaissance: Essays in Honor of Ronald G. Witt*, edited by Christopher S. Celenza and Kenneth Gouwens, 381-398. Leiden: Brill, 2006.

Robertson, Donald. *Mexican Manuscript Painting of the Early Colonial Period: The Metropolitan Schools*. Norman: University of Oklahoma Press, 1994.

Scharf, Cláudia Philippi. "Libri Principis e as Ilustrações de Fauna do Brasil Holandês: Fatura, Técnicas, Materiais e Autores." PhD diss., Universidade Federal da Bahia, 2019. https://repositorio.ufba.br/ri/handle/ri/32344.

Schele, Elaine. "Potential Artistic Representations of the Snake Hemipenis in Mesoamerican Art." FAMSI, 2007. http://research.famsi.org/aztlan/uploads/papers/schele-snake-hemipenis.pdf. Accessed April 30, 2022.

Schmidt, Benjamin. "Geography Unbound Boundaries and The Exotic World In The Early Enlightenment." In *Boundaries and their Meanings in the History of the Netherlands*, pp. 35-61. Brill, 2009.

Schmidt, Peter J. *Maya*. New York, NY: Rizzoli, 1998.

Seler, Eduard. "The Animal Pictures of the Mexican and Maya Manuscripts." In *Collected Works in Mesoamerican Linguistics and Archaeology*, Vol. V, edited by Frank Comparato, 165–340. Culver City: Labyrinthos, 1996.

Sleigh, Charlotte. *The Paper Zoo: 500 Years of Animals in Art*. Chicago: University of Chicago Press, 2017.

Smith, Michael E. "Domestic Ritual at Aztec Provincial Sites in Morelos." In *Domestic Ritual in Ancient Mesoamerica*, Monograph 46, edited by Patricia Plunket, 93-114. Los Angeles: The Costen Institute of Archeology, UCLA, 2004.

Stempell, W. "Die Tierbilder der Mayahandschriften." *Zeitschrift für Ethnologie* 40, no. H. 5 (1908): 704-743. https://www.jstor.org/stable/23030340.

Stone-Miller, Rebecca. *Seeing with New Eyes: Highlights of the Michael C. Carlos Museum Collection of Art of the Ancient Americas*. Atlanta: Michael C. Carlos Museum, 2002.

Storey, Rebecca, Gina M. Buckley, and Douglas J. Kennett. "A Glimpse of the People of Altica: Osteological and Isotopic/Radiocarbon Analysis." *Ancient Mesoamerica* 30, no. 2 (2019): 355-368. Doi:10.1017/S0956536118000354.

Taggart, James M. *Nahuat Myth and Social Structure*. Austin: University of Texas Press, 2010.

Taube, Karl. "Ritual Humor in Classic Maya Religion." In *Studies in Ancient Mesoamerican Art and Architecture: Selected Works by Karl Andreas Taube*, 118-149. San Francisco: Precolumbia Mesoweb Press, 2018.

Teixeira, Dante Martins. "The Image of Paradise: An Iconography of Dutch-Brazil (1624-1654) on the New World's Fauna and Flora." In *Brasil-Holandês / Dutch-Brazil*, edited by Cristina Ferrão and José Paulo Monteiro, 141-183. Rio de Janeiro: Editora Index, 1995.

Tozzer, Alfred Marston, and Glover Morrill Allen. *Animal Figures in the Maya Codices*. Cambridge: Harvard University, 1910.

Turner, Daymond. "Forgotten Treasure from the Indies: The Illustrations and Drawings of Fernández de Oviedo." *The Huntington Library Quarterly* (1985): 1-46. https://www.jstor.org/stable/3817095.

Tyndale-Biscoe, C. Hugh. *Life of Marsupials*. Collingwood: CSIRO publishing, 2005.

Ugalde, María Fernanda. "Difusión en el Periodo de Desarrollo Regional: Algunos Aspectos de la Iconografía Tumaco-Tolita." *Bulletin de l'Institut Français d'Etudes Andines* 35, no. 3 (2006): 399-401. https://doi.org/10.4000/bifea.3937.

Ugalde, María Fernanda. *Iconografía de la Cultura Tolita: Lecturas del Discurso Ideológico en las Representaciones Figurativas del Desarrollo Regional*. Bonn: Deutschen Archäologischen Instituts / Reichert Verlag Wiesbaden, 2009.

Urschel, Donna. "Love & War: Shell Pendant Reveals Clues to Ancient Toltec Culture." *Library of Congress Information Bulletin* 68, no. 6 (June 2009). https://www.loc.gov/loc/lcib/0906/toltecs.html. Accessed April 30, 2022.

Usillos, Andrés Gutiérrez. *Dioses, Símbolos y Alimentación en los Andes: Interrelación Hombre-Fauna en el Ecuador Prehispánico*. Quito: Editorial Abya Yala, 2002.

Vail, Gabrielle, and Christine Hernández. *Re-creating Primordial Time: Foundation Rituals and Mythology in the Postclassic Maya Codices*. Boulder: University Press of Colorado, 2013.

Vail Gabrielle, and Christine Hernández. *The Maya Codices Database*, Version 5.0, 2018. http://www.mayacodices.org/. Accessed April 30, 2022.

Van Duzer, Chet. *Martin Waldseemüller's 'Carta marina' of 1516: Study and Transcription of the Long Legends*. Cham: Springer Nature, 2020.

Voss, Robert S., and Sharon A. Jansa, *Opossums: An Adaptive Radiation of New World Marsupials*. Baltimore: Johns Hopkins University Press, 2021.

Waldron, Lawrence. *Handbook of Ceramic Animal Symbols in the Ancient Lesser Antilles*. Gainesville: University Press of Florida, 2016.

Waldron, Lawrence. "Like Turtles, Islands Float Away: Emergent Distinctions in the Zoomorphic Iconography of Saladoid Ceramics of the Lesser Antilles, 250 BCE to 650 CE." PhD diss., City University of New York, 2010.

Wedemeyer, Rachael. *Fragments of Identity: A Study of Ceramic Figurines from the Terminal Formative Period in the Lower Río Verde Valley, Oaxaca, Mexico.* Undergraduate Honors Thesis, University of Colorado Boulder, 2018. https://scholar.colorado.edu/concern/undergraduate_honors_theses/4f16c3527.

Weinstein, Elka. "The Serpent's Children: The Iconography of the Late Formative Ceramics of Coastal Ecuador." PhD diss., University of Toronto, 1999. https://hdl.handle.net/1807/12804.

Whitehead, Peter, and Marinus Boeseman. *A Portrait of Dutch 17th Century Brazil: Animals, Plants, and People by the Artists of Johan Maurits of Nassau*. Amsterdam: North-Holland Publishing Company, 1989.

Wilbert, Johannes. *The Thread of Life: Symbolism of Miniature Art from Ecuador*. Washington, D.C.: Dumbarton Oaks, Trustees for Harvard University, 1974.

Williams, Robert Lloyd. *Lord Eight Wind of Suchixtlan and the Heroes of Ancient Oaxaca: Reading History in the Codex Zouche-Nuttall*. Austin: University of Texas Press, 2009.

Wilson, D. E., and R. A. Mittermeier, eds. *Handbook of the Mammals of the World: 5. Monotremes and Marsupials*. Barcelona: Lynx Edicions, 2015.

Wolf, Gerald, Joseph Connors, and Louis Alexander Waldman, eds. *Colors Between Two Worlds: the Florentine Codex of Bernardino de Sahagún*. Florence: Kunsthistorisches Institut in Florenz, Max-Planck-Institut, 2011.

Zepeda, Carmen, and Laura White. "Herbolaria y Pintura Mural: Plantas Medicinales en los Murales del Convento del Divino Salvador de Malinalco, Estado de México." *Polibotánica* 25 (2008): 173-199. ISSN 1405-2768.