

The elk, the ass, the tapir, their hooves, and the falling sickness: a story of substitution and animal medical substances*

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Abstract

This article presents a preliminary survey by which to track, in the longue durée, the path of the nail of the Gran Bestia (great beast), a remedy that appeared in therapeutics on both sides of the Atlantic. The Gran Bestia is mentioned in the natural histories, books of remedies, and medical handbooks that proliferated in the Old World and European settlements from the seventeenth century onwards. From the point of view of global history, it is a revealing case from which to investigate, first, how the transfer of a name between continents involved the associated transfer of medical virtues and properties and, second, long before Linnaeus, how the commerce in medicines, skins, and other animal products contributed to associating different animal kinds from different cultural worlds. Far from human universals, the history of the great beast seems to refer to common meanings created by commerce. This article therefore argues for a new investigation into the global and transdisciplinary dimension of objects that is not limited to exclusively local traditions, and may instead reflect the living remains of a long history of exchanges, translations, and transfers that de- and re-functionalized nature in evolving geographies over several centuries.

Keywords animal-based remedies, early modern period, elk and tapir hooves, Latin America

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Introduction

Early in the 1840s, Carl von Martius, professor of botany at the Ludwig-Maximilian University of Munich, published ‘How to write the history of Brazil’, winning first prize in a contest organized by the Instituto Histórico e Geográfico (Historical and Geographical Institute) in Rio de Janeiro. In his essay, Martius emphasized that an understanding of the new South American nation’s history should be connected to the history of the exploitation of a tropical Asian tree. Although this assertion may have sounded strange to national historiographers, Martius was right. After all, Brazil was a country named after a dye of Asian origin, brazilin, which was obtained from a highly valued tree of the species *Caesalpinia sappan*. As it was used in the manufacture of European luxury textiles in early modern times, its economic importance led to the search for alternative species in other continents and eventually to the commercialization of the South American brazilwood (*Caesalpinia echinata*), a tree discovered by the Portuguese along the coast of present-day Brazil.

With his remark, Martius demonstrated that he had mastered a real understanding of his world: the foundation of Brazilian historiography could not be achieved without paying attention to the circulation of goods on a global scale, as well as to the impact that the world trade in natural history products had on the configuration of modern nations. As a botanist, Martius was well aware that nature and history were bound together and that Brazil’s nature was in some way related to Asia through the work of history.¹

Martius’ assessment had a clear message: the history and natural history of the Americas, and therefore the history of the world and of nineteenth-century nature, were the result of the crossroads of intellectual and commercial pursuits as well as the circulation of natural products on a global scale. As part of the transfer and commercialization of natural products for industry, medicine, and agriculture, dyes, hides, furs, flowers, roots, horns, and precious and semi-precious stones had connected continents and people, transferring not only names, uses, and virtues from one place to another, but also the practices and beliefs associated with them. This article argues for a new investigation into the global and transdisciplinary dimension of objects that is not limited to exclusively local traditions, and may instead reflect the living remains of a long history of exchanges, translations, and transfers that, as Martius had suggested, de- and re-functionalized the natural world in evolving geographies over several centuries.

Well before the creation of the Linnaean system, functional classification and commerce had already related natural species from different regions on the basis of common properties. Far from just being a function of analogy, this was the result of the expansion of industrial and medical applications in a context characterized by a kind of zoological and botanical shock: namely, the sixteenth-century confrontation with new flora and fauna, entirely different from those known in Europe, a process that Roger French and Miguel de Asúa have already studied.² This novelty, however, did not prevent the analogizing of Old World and New World

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- 1 Carl Friedrich von Martius, ‘Como se deve escrever a história do Brasil’, *Revista do Instituto Histórico Geográfico Brasileiro*, 6, 24, 1845, p. 391. See Maria Margaret Lopes, Mariza Corrêa, and I. Podgorny, ‘Arrows and sciences: odd displays for another Brazil, 1840–1882’, in Philip L. Kohl, Irina Podgorny, and Stefanie Gänger, eds., *Nature and antiquities: the making of archaeology in the Americas*, Tucson, AZ: University of Arizona Press, 2014, pp. 169–85, and the bibliography on Martius quoted there.
 - 2 Miguel de Asúa and Roger French, *A new world of animals: early modern Europeans on the creatures of Iberian America*, Aldershot: Ashgate, 2005.

animals, plants, and minerals. Neither did it prevent transferring the names and properties of medical substances or *materia medica* – that is, the body of collected knowledge about the therapeutic properties of any substance used for healing – to the New World’s animals, plants, and minerals. *Materia medica*, as is well known, was a kind of ever-changing annotated palimpsest, shaped by the reception and transfer of ancient, Jewish, Arabic, and Persian sources. In the context of medical substances, one can say that the fauna, flora, and minerals from the Americas were incorporated into a globalized medical universe and into a novel ordering of knowledge which, as Lorraine Daston, Katharine Park, and José María López Piñero demonstrated more than two decades ago, was also being modified by the world of new data arriving from the other side of the Pillars of Hercules.³

This article discusses a case history in the realm of animal medical substances, namely the emergence in the seventeenth century of the great beast, an animal whose hide was described as bulletproof, while its ‘nail’ (the so-called nail of the great beast) was reputed to be a remedy against epilepsy. The denomination *gran bestia*, as the elk was called in Spain and Italy, expanded to the African antelope and to the South American tapir and, as with the name, similar curative and industrial properties became attached to animals that are now classified as belonging to different families.⁴ Whether this was due to the circulation of books and drugs, semantic changes, or, as Claude Lévi-Strauss proposed, a kind of structural relationship of nature/culture that crossed and connected different peoples and cultures is a question that requires further research. This article should thus be read as a preliminary panoramic survey in mapping the historical distribution of the names and properties of a cluster composed of an illness, a hoof, and an animal. Analysing the emergence of the ‘great beast’ as the source of a remedy for epilepsy, it describes the characteristics of this ‘global’ illness as well as the problem of naming natural objects. It then considers the transfer of animal names as described by nineteenth-century zoologists once natural history separated from medicine. Paraphrasing Wolf Lepenies, the article shows that traditional natural history survived not only in literature, but also in the practices of other medical traditions.⁵

Central to the discussion is the association between epilepsy and several animal species. Specific attention is accorded to the species known today as *Alces alces*, the largest extant, semi-domesticated species in the deer family; *Tapirus terrestris*, a large herbivorous feral mammal that inhabits jungle and forest regions in South America; and the subgenus *Asinus*, in particular the ass or donkey, a domesticated member of the horse family genetically identical to the wild donkey, a single-hooved grazing animal that has been used as a working animal for at least 5,000 years. The article reflects on how those names carried with them the medicinal virtues and properties implied in the name of the substance they designated but also on how the story of nature is intimately bound up with the story of trade and eventually with the history of

3 José María López Piñero and José Pardo Tomás, *Nuevos materiales y noticias sobre la Historia de las plantas de Nueva España, de Francisco Hernández*, Valencia: Instituto de Estudios Documentales e Históricos sobre la Ciencia, 1994; José María López Piñero and José Pardo Tomás, *La influencia de Francisco Hernández, 1515–1587, en la constitución de la botánica y la materia médica modernas*, Valencia: Instituto de Estudios Documentales e Históricos sobre la Ciencia, 1996; José María López Piñero and María Luz López Terrada, *La influencia española en la introducción en Europa de las plantas americanas: 1493–1623*, Valencia: Instituto de Estudios Documentales e Históricos sobre la Ciencia, 1997; Lorraine Daston and K. Park, *Wonders and the order of nature*, Zone Books, 1998, pp. 1150–1750.

4 John Brooks, ‘The nail of the great beast’, *Western Folklore*, 18, 4, 1959, pp. 317–21; Rafael Folch Andreu, ‘Curiosidades históricas: el alce y la uña de la gran bestia’, *Farmacia Nueva*, 253, 1958, pp. 59–62.

5 Wolf Lepenies, *The end of natural history*, New York: The Confucian Press, 1980.

nation-making. These complex and interwoven processes should not therefore be confined to neatly bordered disciplinary fields.

Animal substances, animal names

Plant, mineral, and animal remedies were central to early modern therapeutics; indeed, up to the eighteenth century the whole of the natural world seemed to comprise a repository of remedies: ‘The Earth is God’s Pharmacopolion’, as the Hesse Paracelsian alchemist and physician Oswald Croll (1563–1609) put it.⁶ While much attention has been paid to botanical remedies, the same cannot be said for those of animal or mineral origin, despite the fact that they were also commonly used as charms or made into medicines to be inhaled, consumed, or applied. The status of drugs made from animals declined in European pharmacopoeia of the second half of eighteenth century, but they continued to play an important role in other medical systems, especially in China, where this is still the case. Most studies of the current uses of wild animals for traditional medicine have focused on Asia or Africa, where, far from disappearing, their use is increasing and is being carried by emigrants to new destinations. This topic, connected with the debate on how such practices affect animal conservation, has produced a vast literature. At stake is the use of such animal parts as tiger bones and rhinoceros horn, and the consumption of seahorses in Southeast Asia and especially among Chinese communities, both at home and overseas.⁷ Research on this topic is also connected with bio-piracy and the ongoing identification of animals that can be used in the pharmaceutical industry.⁸

In what is today called ‘traditional’ Chinese medicine, about 85% of remedies are derived from plants, 13% come from animals, and 2% are mineral-based, all representing a considerable volume in terms of global commerce. These figures have such a profound impact on wild fauna that conservationists regard them as a real catastrophe for the preservation of endangered species. Historical written sources from Chinese medicine also show that the list of products used has evolved throughout the centuries. While the earliest-known pharmacopoeia,

- 6 Oswald Croll, *A treatise of signatures of internal things; or, a true and lively anatomy of the greater and lesser world*, London: John Starkey and Thomas Passenger, 1669. I am very grateful to Chris Duffin for his advice and suggestions regarding this section.
- 7 Rob Parry-Jones and Amanda Vincent, ‘Can we tame wild medicine? To save a rare species, Western conservationists may have to make their peace with traditional Chinese medicine’, *New Scientist*, 157, 2115, 3 January 1998, p. 26.
- 8 See Miruna Achim, *Lagartijas medicinales: remedios americanos y debates científicos en la ilustración*, México: Conaculta/UAM Cuajimalpa, 2008. For a review, see Rômulo and Humberto Alves, ‘The faunal drugstore: animal-based remedies used in traditional medicines in Latin America’, *Journal of Ethnobiology and Ethnomedicine*, 7, 9, 2011. See also Christopher Duffin, R. Moody, and C. Gardner-Thorpe, eds., *A history of geology and medicine*, London: Geological Society of London, 2013; López Piñero and Pardo Tomás, *Nuevos materiales*; López Piñero and Pardo Tomás, *La influencia de Francisco Hernández*; López Piñero and López Terrada, *La influencia española*; Mauricio Nieto Olarte, *Remedios para el imperio: historia natural y la apropiación del Nuevo Mundo*, Bogotá: Instituto Colombiano de Antropología e Historia, 2000; Londa L. Schiebinger and Claudia Swan, *Colonial botany: science, commerce, and politics in the early modern world*, Philadelphia, PA: University of Pennsylvania Press, 2005. On the relevance of South American animals in contemporary pharmacology, see Klaus Angerer, ‘There is a frog in South America / whose venom is a cure: poison alkaloids and drug discovery’, in A. Von Schwerin, Heiko Stoff, and Bettina Wharig, eds., *Biologics: a history of agents made from living organisms in the twentieth century*, London: Pickering & Chatto Publishers Ltd, 2013, pp. 173–91; Klaus Angerer, ‘Frog tales: on poison dart frogs, epibatidine, and the sharing of biodiversity’, *Innovation: The European Journal of Social Science Research*, 24, 3, 2011, pp. 353–69. See also Judith Figueroa, ‘Tráfico de partes e individuos del oso andino *Tremarctos ornatus* en el Perú’, *Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales*, 38, 147, 2014, pp. 177–90.

dating from the first century BCE, lists 365 different plants, animals, and minerals, by the late 1990s, the number had grown to 11,559.⁹ This reflects the continuous addition of substances, products, and species to the remedies list (and their removal), as well the expansion of their complex and interactive history. As the story of the great beast reveals, very few items in the commerce of remedies can be described as ‘traditional’, a term that, in fact, masks the complexity of historical developments. If *materia medica* is a palimpsest of remedies and use, ‘traditional’ medicine as such becomes a meaningless concept. Rather than appealing to some dichotomy between modernity and tradition, this article suggests that a much more complex process of exchange, substitution, and transfer of things and knowledge about things was going on.

Until the second half of the eighteenth century, the art of healing in Europe was not divorced from the practices of natural history; both involved the description of animals’ morphologies, their inherent medicinal properties, and the study of their use by the classical authorities. Animals were, indeed, a source of remedies, commodities, and advantages for humankind. An animal was not only an organized body, endowed with sensation, and spontaneous movement, but was also the custodian of intrinsic and hidden healing virtues. In the kind of medicine championed by alchemists, it was believed that God had endowed natural objects with the keys to the mysteries of disease in a system of symbols or signatures. Through specific physical qualities, a plant, a mineral, or an animal revealed an affinity with a particular star, organ, or disease. There was a mutual analogic sympathy and harmonious concordance of natural objects with the parts of the human body. It was the physician’s job to trace the resemblances between symptoms of disease, on the one hand, and the matching virtues of natural objects, on the other, for these similarities were the signatures, the signs and symbols provided by nature, that would guide him in the search for cures. Signatures not only revealed to which part of the body certain substances were to be applied, but also demonstrated that humans could discover the true medicine for any particular ailment if only they were able to make the correct connection.¹⁰ Understanding the signatures enabled the individual to give the right name to things, as a way of regaining an Adamic language of nature. Affixing an appropriate name to a certain creature was a crucial part of natural history, which is why lexicography, exegesis of ancient texts, and philology became central to the study of nature and physics.

Nature, however, was far from being pristine for either the ancients or the moderns. The two groups shared the problem of the ‘correctness of names’.¹¹ But in the sixteenth and seventeenth centuries it was critical to reconcile the tensions between classical, medieval Christian, and Rabbinic scholarship and the zoologies arriving in the Old World in the wake of new geographical discoveries. Resolving ambiguity, synonymy, and obscurity was part of a praxis that implied the understanding of the properties of substances as expressed in different languages and stemming from different traditions.

9 Parry-Jones and Vincent, ‘Can we tame wild medicine?’, p. 26.

10 Samuel Merrill, *The moose book: facts and stories from northern forests*, New York: E.P. Dutton, 1916, p. 352; Paul Dahms, ‘Ehemalige Verbreitung, Aussterben und volkscundliche Beziehungen des Elchs in Westpreussen’, *Globus*, 74, 1898, p. 219; Kurt Quecke, ‘Die Signaturenlehre im Schrifttum des Paracelsus’, *Beiträge zur Geschichte der Pharmazie und ihrer Nachbargebiete*, 1955, pp. 41–52; Croll, *Signatures*. See also Philip C. Almond, *Adam and Eve in seventeenth-century thought*, Cambridge: Cambridge University Press, 2008, p. 138.

11 See Ben Morison, ‘Language’, in R. J. Hankinson, ed., *The Cambridge companion to Galen*, Cambridge: Cambridge University Press, 2008, pp. 116–56.

Transfer of names

In the case of the elk, we can consider the entry under *Cervus alces* in Philipp Andreas Nernnich's *Allgemeines Polyglotten-Lexicon der Natur-Geschichte (Universal polyglot dictionary of natural history)*, published between 1793 and 1798). The hooves of this animal, said to be found in northern Europe, Asia, and America, had been used in the past as a charm or as a remedy against epilepsy. With some hesitation, Nernnich remarked that some naturalists claimed to have also found the elk in the tropical forests of South America, where it was called *Danta* by the Spaniards and Portuguese, *Vagra* in Peru, *Tapiira* in Brazil, and *Maipouru* in Guiana. According to Nernnich, some others spoke of the existence of an African elk, namely the *Nokoko*, *Dante*, or *Lante* from Congo. He was very cautious about this claim, remarking on the difficulty of proving that the elk was the same animal called *alke* or *alce* by the ancients. Neither the older descriptions nor those coming from Africa and South America were sufficiently precise to assess the regions that the elk actually inhabited.¹²

From a nineteenth-century zoologist's point of view, the practice of reassigning botanical or zoological designations represented a real challenge. The German Baltic biologist Karl von Baer referred to it as *Namen-Übertragungen* ('name transfers'), namely the transfer by travellers, hunters, seamen, soldiers, naturalists, and so forth of the vernacular name of an animal living in a particular region to another seen as analogous but from another part of the world.¹³ This transfer created relationships among animals on the basis of human interactions with local fauna, revealing how classifications worked before we became used to the idea that animals and plants should be grouped on the basis of their internal anatomical characteristics. The early modern world made recourse to function as the criterion for grouping animals. As a result, one name could serve as a category for grouping together different animals and plants. The way these names travelled, over time and space, both to identify and to produce knowledge about objects of the natural world, reveals a 'decentralized' geography of knowledge.

As Nernnich's example shows, the transfer of names occurred not only across regions but also over time. Both in literary sources and in real life, the name of one species that had disappeared from a region was given to another that was perceived as analogous. Names thus passed from one animal to another, with a logic that was shaped by human interaction with nature in general, and with animals in particular. An animal or class of animals was defined and named by human uses of nature. If this animal was inserted into a circuit of commerce or exchange, it is not surprising to find that a common name was created to operate in the hubs where the trade (in the sense of exchange) occurred. Vernacular names continued to exist, as they still do today, but their use was restricted to a region or a linguistic context. The global trade networks required the creation of 'trading names' to communicate in the shared space of commerce.

In this framework, the transfer of animal names from one linguistic or cultural tradition to another followed the circuits of trade. Examples of this abound in the realm of animal–mineral medicinal substances: objects called serpent stones, bezoar stones, and eagle-stones were found

12 Philipp Andreas Nernnich, *Allgemeines Polyglotten-Lexicon der Naturgeschichte*, Hamburg, 1793, pp. 960–1.

13 Ernst von Baer, 'Über das Aussterben der Thierarten in physiologischer und nicht physiologischer Hinsicht überhaupt, und der Untergang von Arten, die mit den Menschen zusammen gelebt haben', *Bulletin de l'Académie impériale des sciences de St. Pétersbourg*, 3, 1861, pp. 1367–96. As this article discusses, transference of names is not just the case in the animal world.

throughout the Andes, and thunderstones (stone or bronze axes) connected China, Europe, and the Americas. Unlike the classification system of contemporary scientific disciplines, in the world of commerce and trade a product was defined by its use and value of exchange rather than its composition, which may have varied locally even when the name was the same.¹⁴

The particular case explored in this article indicates that there were several etymological clusters for the animal under discussion. One of them was the ‘great beast’, a name that appears in German (*größte Bestie*, actually ‘greatest beast’), Italian (*grand-bestia*, *grand-animale*), Spanish (*gran bestia*), and Portuguese (*gram-besta*). In the German/Dutch/Nordic countries, the term used refers to the miserable character of the animal (*elende Bestie*, *Elend*, *Elend Tier*). The other name used in Spain, South America, and Portugal seems to be of Arab origin: *anta* or *danta*. These differences were the result of the late medieval transfer of words and properties: according to several authors, *anta* and the several versions of this word came from the Arab *lamt* or *lamta*, which denoted the Saharan *Oryx*, a kind of antelope, namely what Nemnich quoted as *nokoko*.

In Asia, according to Nemnich, *bulan* was used in the Turkic languages for the elk. In various Altaic languages, this term (*bulān*, with phonetic variants such as *pulan* and *bolan*) means ‘elk’, ‘stag’, ‘moose’, ‘deer’, and, as Sanping Chen remarks, ‘a large wild animal ... with one horn’. Sanping Chen posits the Altaic *bulān* as the origin of the Chinese proper feminine name ‘Mulan’. In turn, this could also be included in another semantic chain, which connected a powerful mythological hero to a large member of the Cervidae family and to other herbivore ruminants that were used both as pack animals and to supply medicinal substances. From ancient times the Chinese had regarded the unicorn as a highly respected symbol and token of auspiciousness, and its horn was used against epilepsy.¹⁵ One can hypothesize that the transfer of the virtues and properties of the several animals denoted by these terms was historically articulated in the trading zones where these worlds encountered each other. Moreover, the terms did not travel in one single direction; rather, they suggest a network of movement across time.

Nineteenth-century zoologists saw the difference in vernacular and trading names as an example of the confusion resulting from the linguistic fragmentation of the natural world before the adoption of Linnaeus’ natural system late in the eighteenth century. For those interested in either the evolution or the distribution of species, these names not only created confusion; as Nemnich remarked, they expanded the geographical distribution of certain

14 The literature on bezoars is extensive. For this article, see D. W. Gade, *Nature and culture in the Andes*, Madison, WI, and London: University of Wisconsin Press, 1999; Andrés I. Prieto, *Missionary scientists: Jesuit science in Spanish South America, 1570–1810*, Nashville, TN: Vanderbilt University Press, 2011; Marcia Stephenson, ‘From marvelous antidote to the poison of idolatry: the transatlantic role of Andean bezoar stones during the late sixteenth and early seventeenth centuries’, *Hispanic American Historical Review*, 90, 1, 2010, pp. 3–39. On Asia, one relevant study is that of Peter Borschberg, ‘The Euro-Asian trade in bezoar stones (approx. 1500–1700)’, in Michael North, ed., *Artistic and cultural exchanges between Europe and Asia, 1400–1900*, Aldershot: Ashgate, 2010, pp. 29–43. See also Rachel Pymm, ‘Serpent stones’: myth and medical application’, in C. J. Duffin, C. Gardner-Thorpe, and R. T. J. Moody, eds., *Geology and medicine: historical connections*, London: Geological Society of London, 2017, pp. 163–80. On eagle-stones, see G. Baronti, *Tra bambini e acque sporche, immersioni nella collezione di amuleti di Giuseppe Bellucci*, Perugia: Morlacchi, 2008; Irina Podgornyy, ‘The name is the message: eagle-stones and materia medica in South America’, in Duffin, Gardner-Thorpe, and Moody, *Geology and medicine*, pp. 195–210. On thunder-stones, see Yi Seonbok, ‘Thunder-axes and the traditional view of stone tools in Korea’, *Journal of East Asian Archaeology*, 4, 1, 2002, pp. 293–306. See also Achim, *Lagartijas medicinales*.

15 Sanping Chen, ‘From Mulan to unicorn’, in *Multicultural China in the early Middle Ages*, Philadelphia, PA: University of Pennsylvania Press, 2012, pp. 44, 57–8.

animals, connecting what today are considered as belonging to different species, genera, and even families. The following sections of this article show how the commercialization of a remedy against epilepsy, the burnt or pounded hoof of a series of animals, contributed to the creation of an animal that in the pharmacological world of the seventeenth century was known as the ‘great beast’.

Epilepsy and animal medical substances

Epilepsy, also known as the ‘falling sickness’, was one of the world’s most intriguing maladies, characterized by the sudden onset of convulsion and seizures. Historians highlight the disease as one that for thousands of years ‘had received more attention than any other individual ailment’.¹⁶ According to historians of medicine, few diseases are clinically as clear throughout the ages as epilepsy, to the extent that it ‘has come to command over as large a host of traditions as has the universally known sensation of toothache or the equally universal process of childbirth’.¹⁷ While there was universal consensus on the seizure as a symptom of the illness, its name and treatment varied locally, as did the understanding of its nature and origins. Often seen as mystical, epilepsy was described as combining spiritual causes (possession, an effect of the devil or of a divine, mystical power) with natural ones (symptom of a brain disorder). According to the Hippocratic medical tradition, epilepsy was humoral, caused by an excess of phlegm that rushed into the blood vessels of the brain and filled the ventricles, creating pressure, which was released via a seizure. Epilepsy was considered to be cold and moist and its treatment required hot and dry substances. In the seventeenth century, when belief in the properties of the great beast’s nail spread through Europe, Asia, and the Americas, iatrochemistry proposed that epilepsy was caused by chemical forces, such as acid vapours irritating the animal spirits contained in the spinal cord and in the brain, which could be counterbalanced by the application of basic salts.

The names of epilepsy, as analysed by Kanner, also reflect the features linked to the disease, spanning everything from its capacity to arouse fear and dread to the deification of the epileptic. For example, ‘Grimm, in his *German Mythology* gives this list of terms for epilepsy: *Jammer* (misery), *Elend* (wretchedness), *böses Wesen* (bad being), *Staupe* (scourge), *Unkraut* (weed)’.¹⁸ In fact, many European languages associated epilepsy with misery and misfortune, a characteristic also attributed to the animals related to its cure, such as the ass/donkey and the elk (*elende Bestie*).¹⁹ For Kanner, Lucius Apuleius from Madaura, the author of the *Golden*

16 Leo Kanner, ‘The names of the falling sickness: an introduction to the study of the folklore and cultural history of epilepsy’, *Human Biology*, 2, 1, 1930, p. 110. Also Thomas L. Bennett, ed., *The neuropsychology of epilepsy*, New York: Springer, 1992; Owsei Temkin, *The falling sickness: a history of epilepsy from the Greeks to the beginnings of modern neurology*, Baltimore, MD: Johns Hopkins University Press, 1994.

17 Kanner, ‘Names’, p. 110.

18 *Ibid.*, p. 119.

19 Nernnich’s *Lexicon* gave a list of German terms in all branches of natural history, with their corresponding terms in eight other European and many Asian languages. For the elk, he listed: in German, *das Elendthier*, *Elenmthier*, *Ellendthier*, *das Elen*, *Elenn*, *Elent*, *Elend*, *Elendt*, *der Elenhirsch*, *die Elendkub*; in Dutch: *Eland*, *Elanddier*, *Allant*; in Danish: *Elsdyr*; in Norwegian: *Elg*, *Ellgur*, *Elsdyr*; in Icelandic: *Elgur*; in French: *eland*, *ellend*. Nernnich underscored: ‘*Von der europäischen Benennung Elend lässt sich mit Gewissheit kein Ursprung angeben* (It is not clear where the European denomination “Elend” originated)’ (p. 961). In German, *Elend* (originally meaning ‘foreign’), is now a synonym for misery; as an adjective (*elend*) it also means sick. The German term *Elen* (meaning elk) is considered a borrowed word from the old Lithuanian *ėhnislėlėnis* (deer).

Ass, was one of the first to describe the occurrence of epileptic seizures in animals, in this case donkeys. Later, the elk was also described as being affected by that disease, and in 1732 Johann Zedler's *Universal lexicon* clearly stated that the elk was given the name 'Elend' because it suffered daily from the falling sickness ('*Der Name Elend aber soll ihm gegeben worden sein, weil es täglich die fallende Sucht bekommt*'). Some claimed, however, that the elk was able to cure itself by putting the hoof of its left hind leg into its ear.²⁰ The logic followed that, if the nail cured its owner, it could also cure humans who ingested it or wore it as an amulet.

There were, of course, many other treatments for the 'falling sickness', which included personal care and ancient pharmaceutical therapies. Pedanius Dioscorides' *Materia medica*, the first extensive European pharmacopoeia, dating from the first century and translated frequently throughout the centuries that followed, mentioned forty-five remedies for epilepsy. Of these, twenty-eight were found in the contemporary arsenal of remedies and seventeen belonged either to magic or to what late in the seventeenth century was called *Dreckapotheke* (literally 'dirt pharmacy', specifically the use of human and animal excrements and other substances of animal origin, such as pus, blood, mucus, mumia, bones, nails, and hair, to cure internal or external diseases). Over time, pharmacological treatises added new products as new geographies were incorporated into the commerce of remedies. The well-known *De materia medica* (originally a Greek manuscript, translated into Arabic in the tenth century and later into Latin) was a compilation of existing remedies from different origins. Its second book describes animal-derived remedies, including those from seahorses, elephant tusks, and worms. Subsequent editions in modern European languages refer to the hooves and roasted liver of asses as substances that could be used to treat the falling sickness, or *gota coral*, as it was called in Spanish. Specifically, a daily drink made of vinegar, horse spavins (excrescences of bony growth), and two spoonful of the ass's burnt hoof was said to cure epilepsy.

The book's Spanish translations by Andrés Laguna in 1555 and by Francisco Suárez de Ribera in 1733 are full of the translators' own comments and marginalia, including Greek words, comments on the animal name, and questions about terminology.²¹ Translation implied comparing vernacular or ancient animal names with the known local species and substances, a task that was often elusive. For that reason, translators listed names in order to link the 'unknown' term (namely, a word arriving from another cultural context and/or language) with the depiction of a 'real' creature or object – one which belonged to the actual or potential experience of the reader. However, in the chapter called 'De las uñas de los asnos y de las cabras' ('On the nails of the asses and goats'), Laguna seemed certain about the meaning of the term used in the existing manuscripts and previous printed versions. It was the ass, that hapless animal (*asno desventurado*), which even after death continued to serve man.²²

As the paradigmatic beast of burden, the ass was a pack animal but also the symbol of the exploitation of the poor. A suffering animal, the humble, sober, obedient, and industrious ass

20 Edward Topsell, *The history of four-footed beasts and serpents. Describing at large their true and lively figure, their several names, conditions, kinds, virtues (both natural and medicinal) collected out of the writings of Conradus Gesner and other authors*, London: Cotes, 1658. The same description, also based on Gesner, can be found in Adam Lonitzer and Peter Uffenbach, *Kreuterbuch*, Frankfurt, 1630, pp. 612–13.

21 On Laguna's translation of Dioscorides, see T. Hernando, 'Vida y labor médica del doctor Andrés Laguna', in *Dos estudios históricos (Vieja y nueva medicina)*, Madrid: Espasa Calpe, 1982, pp. 81–204.

22 A. Laguna, *Pedacio Dioscorides Anazarbeo, acerca de la materia medicinal y de los venenos mortíferos*, Salamanca: Mathias Gast, 1636, p. 146. See also F. Suárez de Ribera, *Pedacio Dioscorides Anazarbeo, anotado por el doctor Andres Laguna, nuevamente ilustrado y añadido, demostrando las figuras de plantas y animales en estampas finas y dividido en dos tomos*, Madrid: Fernández de Arrojo, 1733.

worked hard to avoid a destiny of penury.²³ As Juan Cascajero reminded his readers, the ancient world was a world of asses, since the animal was an essential component of Roman and Greek economic and family life. The donkey tended to be overexploited as a beast of burden while alive, so its bones, meat, tails, and nails were used for a variety of purposes other than consumption once it died. On the other hand, the ass's hide, at least in the Spanish world, was associated with the bravery of soldiers, since the stretched hide was used to make drums and encourage men in war. In the words of the liberal cleric and journalist Pérez Ramajo (1772–1831), '*El pellejo del Asno hace guerreros: ser un héroe tan solo pende a veces del rumor de la piel de un Asno muerto*' ('The hide of the ass makes warriors: to be a hero at times only depends on the noise of the skin of a dead ass').²⁴

In early modern societies, many animal, mineral, and vegetable substances were reputed to be antiepileptic remedies. Of animal origin, the hoof of the ass was joined by earthworms, powdered human skull, scrapings of human vertebrae, human brain, unicorn horn, and burnt ivory.²⁵ These substances were mentioned in books; as objects, they were found in every curiosity cabinet or druggist's shop of the period, such as the Jan van der Mere museum of Delft and the apothecaries of Lewes and Saxony. Although learned physicians in the eighteenth century denounced these remedies as useless, many remained in use.²⁶ However, neither the elk nor the tapir (nor the great beast) can be found in Dioscorides' early modern editions. The transfer of the antiepileptic properties of the ass's nails and the properties of the ass in general to the elk and other animals is a story that took another path.

The emergence of the great beast

Early in the 1580s, the Milanese physician Apollonius Menabenus, former *protomedico* of John III Vasa of Sweden, published a treatise in Latin to discuss the anatomy and virtues of the elk, which, according to him, deserved the name of *magnum animal* or great beast. The elk, mentioned by Caesar in *De bello Gallico*, was an animal that few early modern naturalists and physicians from southern Europe had seen with their own eyes.²⁷ Abundant in Scandinavia, the Baltic regions, Prussia, and Russia, it was one of 'the wonders of the North', those lands only vaguely known to the sixteenth-century learned Mediterranean world.²⁸

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- 23 Juan Cascajero, 'Apología del asno: fuentes escritas y fuentes orales tras la simbología del asno en la Antigüedad', *Gerión*, 16, 1998, pp. 11–38.
- 24 Manuel Lozano Pérez Ramajo, *El asno ilustrado, o sea apología del asno: con notas y el elogio del rebuzno por apéndice*, Madrid: s.n., 1837, p. 28.
- 25 Samuel Auguste Tissot, 'De l'épilepsie: spécifiques inutiles', in *Traité de l'épilepsie*, Paris: Didot, 1770, pp. 353–8; Edward H. Sieveking, *On epilepsy and epileptic form seizures, their causes, pathology, and treatment*, London: Churchill, 1861, pp. 310–21.
- 26 David Murray, *Museums, their history and their use*, vol. 1, Glasgow: MacLehose, 1904, p. 60; John Ray, *Travels through the Low-Countries, Germany, Italy and France*, London: Walthoe, 1738, p. 24.
- 27 Apollonius Menabenus, 'Con quanti, e quai nomi si chiami la Gran Bestia?', in *Trattato del grand'animale o' gran bestia: cosi detta volgarmente & delle sue parti, e facultà, e di quelle del cervo, che servono à Medici*, Rimino: Gio. Simbeni & Compia, 1584, p. 7; Brooks, 'Nail'. Given that the Italian form varies ('Menabeno' or 'Menabene'), I follow Hans Helander, 'The Italian physician Apollonius Menabenus and his treatise *De magno animali* (1581)', *Studi umanistici Piceni*, 19, 1999, pp. 224–332 (see also p. 233, n. 1), who adopted the latinized form 'Menabenus'.
- 28 Brian Ogilvie, *The science of describing: natural history in Renaissance Europe*, Chicago, IL: University of Chicago Press, 2006, p. 231.

The appellation ‘elk’ was, as Menabenus discussed, of ambiguous meaning, and it is also evident that there were innumerable names for designating what today is considered to be a single type of animal. This prolific nomenclature was so extreme that when Wilhelm Blasius, professor of zoology at Braunschweig, published a monograph on the animal in 1887, the first nine pages were dedicated to listing all of the names that had been used to designate the elk since Caesar’s time.²⁹ Blasius remarked that the Swedish naturalist Olaus Magnus (1490–1557), one of the most important early modern authorities on this animal, in his *History of the northern peoples* (printed in Rome in 1555), called the elk a wild ass or *onager*. This analogy and name could explain the transfer to the elk of the virtues that Dioscorides and Pliny attributed to the ass.³⁰ Previously, Solinus had remarked that in Germania there was ‘also a beast called Alce much resembling a Mule, with such a long vpper lippe, that he cannot féede but he must goe backward’.³¹

Vera Nigrisoli Wårnhjelm suggests that the facts narrated by Magnus could have stimulated Menabenus to write about the elk, an animal that in Sweden had been placed under the king’s protection and was considered royal game.³² Aware of the potential commercial interest in Swedish natural objects, considered exotic and curious things, as commodities, Menabenus promoted the medicinal uses of the elk’s hoof to treat epilepsy, as previously described by Conrad Gessner (1551).³³ Referring to his own first-hand experience, Menabenus published his *Treatise on the great beast* in Latin in Milan and Cologne (1580 and 1581). A few years later, it was translated into Italian (1584) and was consequently quoted extensively by other Italian physicians and naturalists, such as Ulisse Aldrovandi (1522–1605) and Andrea Bacci (1524–1600). In particular, Bacci’s *Discorso della gran bestia detta alce da gli antichi*, translated into Latin (1598) and Spanish (1678), popularized both the name and the virtues of the great beast’s nails and bones, which began to be exhibited or stored in the most important Italian cabinets of curiosities.³⁴ In 1600, Bacci’s Italian version of 1587 was exported to New Spain, together with Andrés Laguna’s *Dioscorides*, and several books on Paracelsian and Galenic medicine and pharmacopoeia.³⁵

As a result of the Italian trade in books and the commerce in hooves that the books activated, the ‘great beast’ as a name for a product proliferated far beyond the Scandinavian countries. Thus, by the seventeenth century, the general category of *gran bestia* subsumed at least seven or eight animals: the elk (*Alces alces*) and animals that today are known as the African genus *Oryx*, the Irish deer (*Megaloceros giganteus*), and three animals from the Americas: the tapir (genus *Tapirus*), the moose (*Alces alces*), and the wapiti

29 Wilhelm Blasius, *Das Elch* (Alce palmata, Klein), Vienna and Leipzig: Perles, 1887.

30 Topsell, *History*, p. 25.

31 C. Julius Solinus, *The excellent and pleasant worke of Iulius Solinus Polyhistor*, trans. Arthur Golding, London, 1587, chapter 31, unnumbered page.

32 Toomas Kotkas, *Royal police ordinances in early modern Sweden: the emergence of voluntaristic understanding of law*, Leiden: Brill, 2014, p. 60.

33 Menabenus, *Tratatto*; Vera Nigrisoli Wårnhjelm, ‘Apollonio Menabeni, protomedico di Giovanni III di Svezia e il suo trattato sull’alce’, in Fabiola Zurlini, ed., *Atti della 37 Tornata degli Studi Storici dell’Arte Medica e della Scienza*, Fermo: Andrea Livi, 2008, p. 95.

34 Andrea Bacci, *Le xii pietre pretiose. Discorso dell’alicorno et delle sue singolarissime virtù: et della gran bestia detta alce da gli antichi*, Roma: Martinelli, 1587. See Murray, *Museums*, pp. 58–61; David Ruderman, *Kabbalah, magic, and science: the cultural universe of a sixteenth-century Jewish physician*, Cambridge, MA: Harvard University Press, 1988, esp. ch. 4, ‘Unicorns, great beasts, and the marvelous variety of nature’; Michael Bury, ‘Bernardo Vecchietti, Patron of Giambologna’, *I Tatti Studies in the Italian Renaissance*, 1, 1985, p. 161.

35 Otis Green and Irving A. Leonard, ‘On the Mexican booktrade in 1600: a chapter in cultural history’, *Hispanic Review*, 9, 1, 1941, pp. 1–40.

(*Cervus canadensis*).³⁶ One can say that long before the creation of the Linnaean system, in a context of an epistemology of resemblance, names such as *gran bestia* connected animals from different regions on the basis of common virtues and properties, such as strength and size, the presence of hooves, the vast magnitude of the antlers, or their use in handicrafts.

The moose, for example, was part of the natural world of New France described by the Jesuits. In their descriptions, it was said that the hoof of the left leg of the moose, called the great beast by the natives, was used to cure epilepsy, whether applied to the breast, where the heart was throbbing, or placed in the bezel of a ring and worn upon the fourth finger of the left hand. From late in the seventeenth century, the moose's left hoof was reported as part of the local pharmacopoeia of the Abnaki.³⁷ A century later, when the Jesuit order was expelled from Spain and the Americas in 1767, nails of the great beast were recorded in apothecary's shops throughout the continent, including the Jesuit *Botica* from Santiago de Chile.³⁸ That object was not, however, the nail of a Canadian moose.

Had these remedies filtered down through university medical chairs, religious orders, hospitals, pharmacies, and home care manuals in Spanish America? As multiple studies from all over the world have shown, the missionary pharmacies articulated a network of exchange in natural products, as objects, depiction, and/or text.³⁹ José María López Piñero's team and, later, Asúa and French analysed how sixteenth-century Spaniards were confronted with elements of a new fauna, entirely different from that known in Europe and in ancient times, which arrived almost daily at their ports.⁴⁰ This sharp zoographic separation induced them to analogize Old World and New World animals and plants. Fauna, flora, and various petrifications of the Americas were incorporated into a new order of knowledge where signs and names were also part of things.⁴¹

In Spanish America, as already mentioned, the name *gran bestia* was given to the region's most impressive mammal, now known as the tapir. The name was taken from the Tupi, the lingua franca in the Portuguese domains, and expanded to European languages as the general term for this kind of animal. Today the name includes five extant species, including one from Malaysia (*Tapirus indicus*), which was first described early in the nineteenth century, proving that this animal hitherto considered as being specific to the New World was also common in the forests on the Malay peninsula.⁴² However, no medical use of the Asian tapir was recorded; its discovery was framed in the new disciplines of the nineteenth century.

While the name 'tapir' was first used in the second half of the sixteenth century, the Spaniards had mentioned this animal before, comparing it to elks, cows, tigers, and asses; in such analogies, it was called *vaca*, *vaca montés*, *tigre tanta*, *vaca danta*, *sachavaca*, *vaca*

36 Brook, 'Nail'.

37 Merrill, *Moose book*, pp. 263–8.

38 Enrique Laval Manríquez, *Botica de los Jesuitas de Santiago*, Santiago de Chile: Asociación Chilena de Asistencia Social, 1953, p. 199.

39 See, for instance, R. A. Reyes, 'Botany and zoology in the late seventeenth-century Philippines: the work of Georg Josef Camel SJ (1661–1706)', *Archives of Natural History*, 36, 2, 2009, pp. 262–76; Baronti, *Tra bambini*; Prieto, *Missionary scientists*.

40 Raquel Álvarez Pélaez, *La conquista de la naturaleza americana*, Madrid: Consejo Superior de Investigaciones Científicas, 1993; Asúa and French, *New world*; Wilma George, 'Sources and background to discoveries of new animals in the sixteenth and seventeenth centuries', *History of Science*, 18, 1980, pp. 79–104; López Piñero and Pardo Tomás, *Nuevos materiales*.

41 Gade, *Nature and culture*, pp. 132–5.

42 On the history of the description of the Malaysian tapir, see William Farquhar, John Sturgus Bastin, Chong Guan Kwa, Hassan Ibrahim, and Morten Strange, *Natural history drawings: the complete William Farquhar collection: Malay peninsula, 1803–1818*, Singapore: Editions Didier Millet, 2010, pp. 26–7. Also Eric Bufetaut, 'Un tapir bien malencontreux', *Espèces*, 21, 2016, pp. 70–3.

mocha, and *anteburro*, the last one showing that the tapir was seen as a combination of elk (*anta*) and ass (*burro*).⁴³ Those appellations coexisted with the native names, such as *vagra* (Peru), *beori* (New Spain), *maipouri* (Guiana), and the Guaranese *mborebi*. The Spaniards and Portuguese started calling the animal *anta*, *adanta*, *danta*, or *gran bestia*, which were the Spanish and Portuguese names for the elk. It is not completely clear when the American tapir became known as the *gran bestia*. The sources indicate that the proliferation of this kind of analogy happened during the seventeenth century; that hypothesis, however, still needs further research. What we do see in that century is a burgeoning interest in this beast, the propagation of its virtues in the literature, and the commerce of drugs in a geographical span that included the Americas, Europe, and East Africa. In Africa, the terms ‘great beast’ and *alce* were used in the seventeenth century for the Congolese animals that the Portuguese called *macoco* and the locals referred to as *ncocco* or *néollo* (antelopes, *Oryx*).⁴⁴ According to the Italian missionaries to East Africa, the nails of the right foot of these beasts had particular virtues (Figure 1).⁴⁵

Early in the twentieth century, anthropologists recorded that Afro-Puerto Rican *santeros* or magic men wore the nail of the great beast, supposedly a tapir’s hoof, tied in a packet of tinfoil inside a cloth around the neck as protection. J. Walter Fewkes, probably unaware of the multiple traditions and exchanges involved in the history of the great beast, said that it was difficult to distinguish charms and amulets of Native American origin from those of African descent.⁴⁶ In the context of a decentralized geography of knowledge, the Americas played an important role, not just as producers of prime materials and products (as more traditional narratives have claimed) but also as shapers of the direction of trade and of knowledge. Things, names, and knowledge about things moved in convoluted and complex ways.

Trade in materials: the nail and the hide of misery

The transfer or loan of names is, in fact, a very complex phenomenon. It also implies the corollary of the transfer of the inherent properties and virtues in animals by means of commerce and trade on a global scale.⁴⁷ Natural histories of the elk report that humans utilized every

43 François Désiré Roulin, ‘El tapir Pinchaque: memoria para servir a la historia del tapir, y descripción de una especie nueva de las regiones elevadas de la cordillera de los Andes’, in *Viajes científicos a los Andes ecuatoriales*, Paris: Librería Castellana, 1849, pp. 244–6.

44 The Portuguese records listed among the drugs coming from India ‘unha de Gran Bestia’, an animal called ‘macoco’ by the Bantu-speaking people from Angola (see Archives of the Academia de Ciências de Lisboa, Lisbon, ACL, Ms. Azul, 21, ‘Medicina Oriental: Socorro Indico dos Pobres Enfermos do Oriente. Para total profligação de seus males. Adquiridade de varios Professores da Medicina. Oferecida a Santissima Trindade Unico Deos Verdeiro. Por hum natural de Goa (Oriental medicine: Indian relief o the sick poor of the East. For the total destruction of their evils. Acquisition of several professors of medicine. Offered to the Holy Trinity, the one true God. By a native of Goa)’; and ACL, Ms. Vermelha, 586, ‘Virtudes de raizes, pedras e óleos da Índia (Virtues of the roots, stones and oils of India)’). I am indebted to Lais Viena de Souza (University of Bahia, Salvador, Brazil) for sharing the results of her research on the Portuguese missionary pharmacies with me. On the Portuguese trade in drugs from India, see also Palmira Fontes da Costa, *Medicine, trade and empire: Garcia de Orta’s colloquies on the simples and drugs of India (1563) in context*, London: Routledge, 2016.

45 Théophile Obenga and Francesco da Pavia, ‘La faune du Royaume de Kongo d’après un document inédit du XVII siècle’, *Africa: Rivista Trimestrale di Studi e Documentazione dell’Istituto Italiano per l’Africa e l’Oriente*, 28, 1, 1973, pp. 73–89; Girolamo Merolla and Angelo Piccardo, *Breve, e succinta relatione del viaggio nel regno di Congo nell’ Africa meridionale, fatto dal P. Girolamo Merolla da Sorrento, sacerdote cappuccino, missionario apostolico*, Naples: Francesco Mollo, 1692, pp. 62–3.

46 J. Walter Fewkes, ‘Precolumbian West Indian amulets’, *American Anthropologist*, n.s. 5, 4, 1903, p. 690.

47 Gade, *Nature and culture*; Pamela Smith and Paula Findlen, eds., *Merchants and marvels: commerce, science, and art in early modern Europe*, New York: Routledge, 2001.

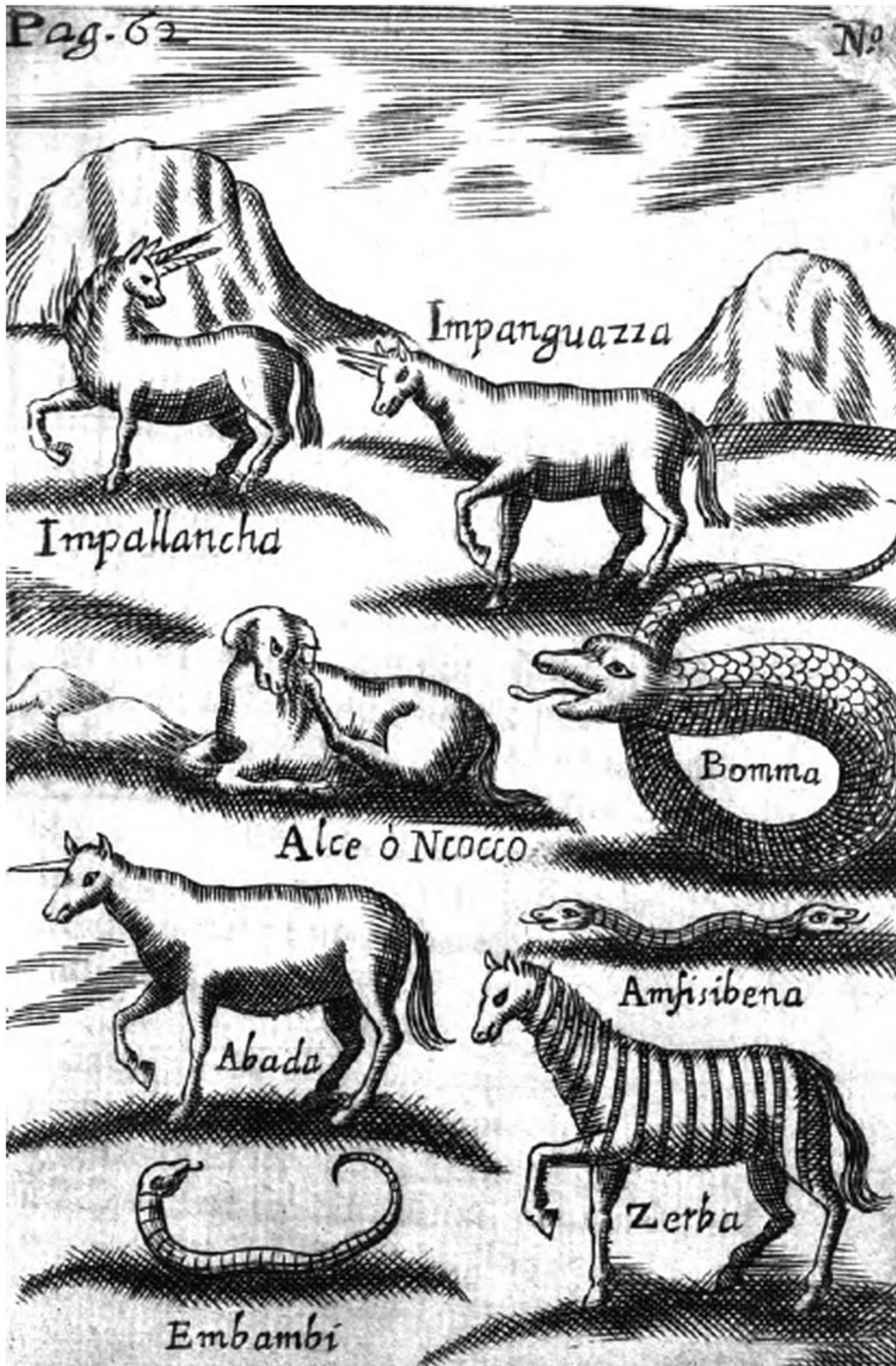


Figure 1. The African great beast or African elk, known as *ncocco* or *macoco* in the Bantu languages of present-day Angola. Traded by the Portuguese, it was marketed as part of *materia medica indica*. Source: Merolla and Piccardo, *Relazione del viaggio*, p. 62.

single part of the animal (meat, hooves, antlers, nerves, and bones), which resisted all attempts at domestication. Prior to the use of their nails for remedies, elk had been highly valued for their hides, which were used for payments, tributes, and war indemnities. The Russians obtained them from the Siberian Khanty and Nentsy peoples, trading in hides with China.⁴⁸ In the seventeenth century, elk was one of the most popular hides in Muscovy.⁴⁹ Considerable stocks of elk skins from Siberia and the Yug river region were transported through the Dvina to Arkhangelsk for local trading purposes. In the 1670s, the market at Arkhangelsk received around 5,000 Siberian hides annually. In 1671, Arkhangelsk imported forty-two tanned elk hides from abroad.⁵⁰

The trade in elk skins from Russia and Livonia was partly managed by the Dutch, who transported them to Spain and Portugal, where *anta*, as mentioned before, became the general name for the elk, the buffalo, and all animals ‘which had an armour’, namely animals whose skins, reputed for their quality, were used for crafting shields, armour, breeches, and jackets for soldiers. Arab geographers in the Middle Ages referred to the large Berber tribe of the Lamta, who were particularly famous for the light and solid shields they made from an animal by that name and which were offered to the kings of the Mahgrib and al-Andalus.⁵¹ As mentioned in some glossaries, ‘Anta’ or ‘Danta’ was the generic name for animals from whose hide shoes, bibs, and so forth were made, and that is why they were called ‘ante skin’. ‘Anta’ or ‘ante hide’ referred not only to the hide of the tapir, but also to that of the buffalo, moose, fallow deer, and deer, which were prepared with oil.⁵²

Many sources have referred to this craft. Topsell mentioned that elk hides were dressed by tanners with the fat of fishes and alum to make breastplates and rain shelters.⁵³ Oil-tanned elk hide was highly prized for clothing since it was considered bulletproof, like that of the rhinoceros, the African *ncocco*, and the American tapir. Friedrich Schiller in *Wallenstein camp*, set in the first half of the seventeenth century, mentions this property in his description of the hero’s attire: ‘He wears a jerkin of elk-skin tough, through which no bullet may find its way’ (*‘Er trägt ein Koller von Elendshaut, das keine Kugel kann durchdringen’*). Not surprisingly, the Spanish naturalist Félix de Azara (1746–1821) was still attributing this property to the Paraguayan tapir as late as the late eighteenth century, emphasizing that ‘the gun never succeeds in killing them’.⁵⁴ As previously mentioned, the ass’s hide also had a reputation for encouraging soldiers in the battlefield. So, the great beast, in all its forms, combined two properties expressed in two different materials that were both objects of trade: a bulletproof skin, suitable for shields and armour, and a sickly nature, which held an intrinsic therapeutic virtue.

48 James Forsyth, *A history of the peoples of Siberia: Russia’s North Asian colony 1581–1990*, Cambridge: Cambridge University Press, 1992, p. 113.

49 Richard Hellie, *The economy and material culture of Russia: 1600–1725*, Chicago, IL: University of Chicago Press, 1998, p. 276.

50 Johann Philipp Kilburger, ‘Kurzer Unterricht von dem Russischen Handel, wie selbiger mit aus- und eingehenden Waaren 1674 durch ganz Russland getrieben worden’, *Magazin für die neue Historie und Geographie*, 3, 1769, pp. 261–2.

51 C. E. Bosworth, E. van Dozel, B. Lewis, and C. Pellat, ‘Lam’ and ‘Lamta’, in *The Encyclopaedia of Islam*, vol. 5, Leiden: Brill, 1983, pp. 651–2.

52 Ciro Bayo, *Vocabulario Criollo-Español Sud-Americano*, Madrid: Hernando, 1910; William Entwistle, *Las lenguas de España: castellano, catalán, vasco y gallego-portugués*, Madrid: Itsmo, 1982, p. 288. See Merrill, *Moose book*, pp. 284–6; Roulin, ‘Tapir Pinchaque’.

53 Topsell, *History*, p. 169.

54 Félix de Azara, *The natural history of the quadrupeds of Paraguay and the river la Plata*, Edinburgh: A. & C. Black, 1838, p. 102.

The promotion of the elk's virtues was such a success that Lithuania became the centre of an industry in healing amulets that used the elk's hoof, its traffic extending as far as Italy and Spain, as displayed by the aforementioned inventories.⁵⁵ Baltic artisans specialized in elk bones, antlers, and hooves; rings were made from the hoof's keratin and worn on the ring finger of the left hand. Pieces of the hoof were set in rings of gold and worn so that the curative medium would be in contact with the skin.⁵⁶ In early modern Russia, however, the antler and horn sector was an exotic one; the commodities were few and possessed by few, probably harvested in Belorussia or in western Muscovy.

Russian commerce in animal by-products was substantially affected by trade in very few and expensive specimens, such as medicinal narwhal and rhinoceros horns.⁵⁷ In early modern Russia, antlers were of negligible importance commercially. The really significant sector of trade connected to mammals was that of hides and leathers; in addition, the trade in elk hooves was very active in the seventeenth century. Apothecaries and mountebanks from all over Europe sold and traded elk in its different forms, as charms, amulets, or chemical products. In Paris, *piéd d'élan* and *ongle d'élan* were offered early in the 1700s; German apothecaries from the second half of the seventeenth century sold *Elchsklauen*, either as a powder, as a preparation, or in calcined or untreated form.⁵⁸ Apothecaries also offered elk's fat (*Axungia alcis*) and antlers (*Alcis cornu*). The hoof was sold under the name of *ungula alcis/alcis ungulae* (Figure 2).⁵⁹

In 1663, the German alchemist Johann Joachim Becher described the three different forms that druggists offered: *ungula*, *magisterium*, and *destillatum*. *Ungula praeparata* was the result of grinding the hooves on a marble stone or mortar and mixing the resulting fragments with *aqua primulae veris* (extract of primrose flowers), then, once dried, shaping them into pearls. In distillation, the essence of the hoof was extracted in the form of a liquid, concentrating the specific properties of the supposed active ingredient into a small volume.⁶⁰ Becher, an expert in promoting projects and objects (and himself), was working on the principles of the chemical theory of essences, the 'virtue' of a remedy and its chemical composition. There was thus no real contradiction between the morphological principle of signatures and Paracelsus's chemical theory of the 'quintessence' – the effective extract of a plant, animal, or mineral without shape or form. So the elk hoof, as an alchemical distillate, charm, or powder, was incorporated into what were called the chemical-Galenic pharmacopoeias that proliferated from the seventeenth century onwards.

55 Merrill, *Moose book*; Dahms, 'Ehemalige Verbreitung'.

56 Merrill, *Moose book*, p. 348; Dahms, 'Ehemalige Verbreitung'.

57 Hellie, *Economy*, pp. 282–3.

58 Pierre Pomet, *Histoire générale des drogues, traitant des plantes, des animaux, & des minéraux*, Paris: Lotson, 1694, pp. 23–4.

59 See *Apotheken-Ordnung und Taxa Derer in denen Apotheken der Churfl. Sächs. alten freyen Berg-Stadt Freybergk in Meissen / befindlichen Medicamenten und Materialien, durch E.E. Rath daselbsten auffgerichtet und publiciret [sic]*, Freyberg: Becker, 1673 and 1680; *Catalogus Aller Galenischer und Chymischer Artzneyen die in F: Churf: Durchl: zu Sachssen HofApotheke in Drefßden mit boehstem fleiß praeparirt und zu finden sein*, Dresden: Bergen, 1652 and 1683; *Catalogus Tam Simplicium, Quam Compositorum Medicamentorum*, Dresden: Typis Baumannianis, 1686; *Churfürstliche Brandenburgische Medicinal-Ordnung und Taxa*, Cöln an der Spree: Völcker, 1694; *Consignatio, et taxa omnium medicamentorum, tam simplicium, quam compositorum, quae in officina pharmaceutica Cellensi prostant*, Zelle, 1682.

60 Johann Becher, *Parnassi illustrati pars prima, zoologia*, Ulm: Görlin, 1662 [1663]. On Becher as alchemist, see Pamela Smith, *The business of alchemy: science and culture in the Holy Roman Empire*, Princeton, NJ: Princeton University Press, 1994. The preparation of the nail would have been similar to the process that Duffin described for amber, frequently mentioned in recipes for curing epilepsy (C. Duffin, 'Fossils as drugs: pharmaceutical paleontology', *Ferrantia*, 54, 2008, pp. 53–65).



Figure 2. A pharmacy chest from Spain, including a drawer for *ungula alcis*. It would originally have contained powdered elk's hoof to prevent seizures from epilepsy. Source: courtesy of the Museo de la Farmacia Hispana–Patrimonio Histórico, Universidad Complutense de Madrid. Photographer: Isabel Martínez Navarrete.

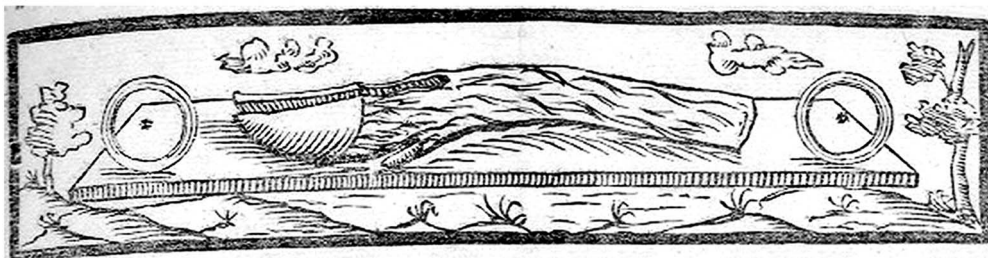
The nail appears as a component of several recipes to fight epilepsy, such as the so-called *poudre de gouttete*, a recipe used in England early in the eighteenth century that mixed amber, elk claws, and human skull in powder. *Ungula alcis*, vulgarly called the elk claw, was a cloven hoof that was moderately large, shiny black, very hard, and quite heavy. The druggist generally took care to have a part of the leg of the animal displayed with it to show that it truly was the hoof of an elk and not some similar animal (see Figures 3a, 3b, and 4).

From the other side of the Atlantic, Félix de Azara, describing the tapir or *mborebi*, remarked that ‘to the nails of their toes ground down and taken in powder, is attributed the power of curing epilepsy’.⁶¹ It appears that he did not himself observe or register this kind of practice, but was simply quoting the observations of others. But he was neither the first nor the only one: every time that the tapir was described, the virtues of its toenails were also mentioned. For instance, in 1731, the Jesuit priest Father José Gumilla (1686–1750) reported from the Orinoco missions on the medical use of the great beast among the Achagua nation. *Antas*, which Gumilla described as an animal similar to a donkey (*jumento*), were hunted by Spaniards for their hides and hooves.⁶²

61 Azara, *Natural history*, p. 103.

62 Joseph Gumilla, *El Orinoco ilustrado: historia natural, civil y geográfica de este gran río*, Madrid: Fernández, 1741.

(a)



(b)



Figure 3. The nail of the great beast as it was sold in the seventeenth century. The foot of the elk had to be displayed in order to prove that the hoof on sale belonged to that animal and was not obtained from any other animal. a. elk's foot. Source: Andrea Bacci, *Virtudes y maravillosas calidades de la uña de la gran bestia*, 1675. b. Hoof of the great beast. Source: courtesy of the Museo de la Farmacia Hispana–Patrimonio Histórico, Universidad Complutense de Madrid. Photographer: Isabel Martínez Navarrete.

Gumilla's observations would be incorporated into European remedy books, and become included in the eighteenth-century Spanish translation of the *Charitable remedies* of Madame Marie Mapéau Fouquet, that 'hotchpotch of traditional pharmacy (excrement, animal oils, echoes of old astrological medicine) and the fashionable remedies from the seventeenth century (mercury, antimony)'.⁶³ When originally published in French in 1675, Fouquet's book said nothing about either South American tapirs or the great beast. However, the French edition from 1696 listed the so-called *poudre merveilleuse* as one of

63 On Madame Fouquet, see Matthew Ramsey, 'The popularization of medicine, 1650–1900', in Roy Porter, ed., *The popularization of medicine*, London: Routledge, 1992, pp. 102–3.

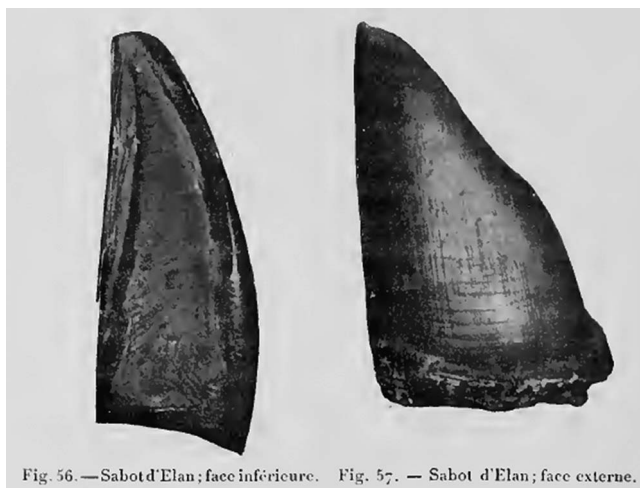


Fig. 56. — Sabot d'Élan; face inférieure. Fig. 57. — Sabot d'Élan; face externe.

Figure 4. Elk's nail. University pharmacological collections amassed examples of animals linked to *materia medica*. While these were maintained by the Universidad Complutense de Madrid, other university museums discarded what were viewed as 'useless objects'. The Parisian Musée de Pharmacie (Musée François Tillequin – collections de matière médicale) dismantled its animal collections in the 1970s and most of the collected objects were lost. This image, however, records the existence of elk's hoof in the Paris collection early in the twentieth century. Source: H. Bauregard. *Matière médicale zoologique: histoire des drogues d'origine animale*, Paris: Naud, 1901.

the many recipes for curing epilepsy. This 'wonderful powder' was the classical composite of human skull mixed with elk hoof, oak viscum, and cinnabar/mercury.⁶⁴ Translated into Spanish in 1739, the collection of recipes incorporated the *gran bestia* twice. The first came in the translation of the formula quoted above, where the *ongle d'élan* was translated as *uña de la gran bestia* (the skull, in this case, should come from a convict who had been beheaded rather than strangled).⁶⁵ Secondly, Father Gumilla observes that the *gran bestia* was defined as the *anta* in Venezuela. Similarly, in Spanish dictionaries from the late eighteenth century, the elk was replaced by the South American tapir. One can say that, wherever the *gran bestia* went, so did the virtues of its hooves and hides. This was not only a function of analogy but also a practical result of the expanding virtues of the preparations that travelled back and

64 See Christopher Duffin, 'Some early eighteenth century geological materia medica', in Duffin, Moody, and Gardner-Thorpe, *History of geology*, p. 227, for further details on the uses and preparation of cinnabar associated with the cure of epilepsy.

65 Marie Mapéau Fouquet, *Obras medico-chirurgicals de Madama Fouquet: economia de la salud del cuerpo humano. Aumentadas de un Alfabeto breve de los varios remedios, Yervas, Frutas, Raíces, Aceites, resinas y otras cosas medicinales nuevamente descubiertas en la América o Indias Occidentales en la Provincia o Misiones del gran Río Orinoco*, Salamanca: Villargordo y Alcaraz, 1750, p. 17. Also *Diccionario de la lengua castellana compuesto por la Real Academia española*, Madrid: Ibarra, 1783. On the use of materials taken from the bodies of executed criminals, see Kathy Stuart, 'The executioner's healing touch: health and honor in early modern German medical practice', in Max Reinhart, ed., *Infinite boundaries: order, disorder, and reorder in early modern German culture, Sixteenth Century Essays and Studies*, 40, 1998, pp. 349–80, and the bibliography cited there.

forth between the Americas and Europe, together with the trade in books and animal and natural history products.

In the late eighteenth century, Spain continued to trade in all kinds of medicinal stones and animal drugs, as can be traced in the commerce almanacs published between 1795 and 1808 in Madrid by Diego María Gallard, lawyer to the Royal Council, with the support of the Spanish crown.⁶⁶ These almanacs included lists of imports and exports, the taxes levied on them (about half the pages were dedicated to this section), and information on the Peninsular and Spanish American marketplaces. Sold in Madrid, Cádiz, Malaga, Seville, Valencia, Barcelona, Pamplona, Bilbao, and some Spanish American cities, the almanacs were conceived as a tool to promote commerce in a context of political and commercial reform, representing a reliable source for economic history. Gallard, who compiled this information thanks to his extensive network of correspondents, listed – among many other goods – the national and foreign drugs traded in Spain, including medicinal stones and animal substances, such as the ‘*manos, pies y uñas de la gran bestia*’ (‘hands, feet, and nails of the great beast’).

According to the almanacs, all *gran bestias* passing through customs were ‘foreign’, namely not ‘native’ of ‘these Kingdoms’ (Spain, Spanish America, and the Philippines). The term ‘foreign’ included Portugal and countries in friendship and alliance with Spain, as well as the rest of the world. This could mean that there was no trade in tapir hooves between South America and Spain, and that the medical use of tapir remained local, a use that continued into the nineteenth and twentieth centuries. The Chuntaquiuro (or Piro People), who lived in the Madre de Dios River in the Peruvian Amazon in the mid 1830s, came 200 leagues upriver annually to barter with the inhabitants. They brought parrots and other birds, monkeys, cotton robes, wax, balsam, and hooves of the *gran bestia*, which they exchanged for hatches, knives, scissors, needles, and buttons.⁶⁷ Until recently, the Kallawaya and the Cholas from Bolivia and Peru included the tapir hoof as part of their pharmacopoeia.⁶⁸ In Ecuador, a portion of the tapir’s toe is even today believed to cure all ills, while a scrap of hide, a fragment of bone, or a tooth may still be purchased on village street corners as a talisman to guarantee success in love and business.⁶⁹ Today, the use of tapir’s hoof and hide for medical purposes is mentioned only in relation to the mountain species (*Tapirus pinchaque*) as one of the factors that encourages hunting and contributes to its endangerment.⁷⁰

The almanacs do not indicate where the *manos de la gran bestia* originated, but do indicate that they were taxed at 0.30 *maravedies* each.⁷¹ While this price indicates that the *manos* (hands) were not very valuable, the sources confirm that early in the nineteenth century there was still an active market for medical items that had already been discarded from the universe

66 P. Fernández Pérez, ‘El Almanak mercantil o Guía de comerciantes (1795–1808) como fuente para la historia económica de España y América’, *Historias*, 22, 1989, pp. 189–92.

67 Guillermo Miller, ‘Notice of a journey to the northward and also to the eastward of Cuzco, and among the Chunchos Indians, in July, 1835’, *Journal of the Royal Geographical Society of London*, 6, 1836, pp. 174–86.

68 Erland Nordenskiöld, ‘Recettes magiques et médicales du Pérou et de la Bolivie’, *Journal de la Société des Américanistes*, 4, 1907, pp. 153–74; Louis Girault, *Kallawaya, guérisseurs itinérants des Andes: recherches sur les pratiques médicinales et magiques*, Paris: ORSTOM, Institut français de recherche scientifique pour le développement en coopération, 1984, pp. 511–12.

69 Erwin Patzelt, *Fauna del Ecuador*, Quito: Las Casas, 1979, p. 89.

70 Tapir Specialists Group, Press Kit, <http://tapirs.org/wordpress/wp-content/uploads/2017/03/Tapir-Press-Kit-English.pdf> (consulted 14 November 2017).

71 *Almanak mercantil ó Guía de comerciantes para el año de 1808*, Madrid: Vega y Compañía, 1808, pp. 75 and 77. The Spanish American bezoar stones were valued at 4,000 reales per quintal.

of learned physicians and naturalists. Moreover, the listing as *manos* indicates that the ‘nails’ were traded with the entire foot, as evidence that they belonged to the real great beast and were not counterfeit. One such elk’s hoof is still on display in the Museo de Farmacia at the Universidad Complutense de Madrid (see Figure 3b). Further research into this trade could yield other published sources that could be mined to determine, for instance, the country of origin and the volume of the great beast traded in the years of political and cultural reform, just before South American independence and the outbreak of the Napoleonic wars.

Dense descriptions reconstruct the circuits of knowledge on a case-by-case basis. Working at different scales of analysis, the great beast helps in reinserting America, especially Latin America, into this global picture by studying it as one protagonist, among others, that participated actively in the making and circulation of knowledge. Often-forgotten actors – missionaries, commercial agents, artisans – are part of this story.

Conclusions

In examining the case of the entrenched European belief that elk’s hooves could cure epilepsy, this article has related that belief to similar practices regarding the tapir in the Americas. It first analysed how the transfer of a name between continents involved the associated transfer of medical properties, and second considered how, long before Linnaeus, global commerce in medicines, hides, and other animal products contributed to associating different animal kinds from distinct continents and cultural worlds, creating ‘local products’ whose convoluted and transregional history is today forgotten.

Late in the 1990s, the cultural-historical geographer Daniel W. Gade published ten essays under the title of *Nature and culture in the Andes*. Here he discussed the relevance of trajectories, namely how ‘people, plants, animals, the land, and everything else on earth are interlaced in singular and sometimes dysfunctional ways’.⁷² He also referred to the intellectual challenges posed by the ‘enigmatic configuration of the nature/culture gestalt’, in particular to the reconstruction of ancient patterns from fragments of evidence and inferences.⁷³ As a paradigmatic case of such a configuration, he analysed the strong connection in Andean cultural history between the tapir and human epilepsy, a connection that, according to Gade, resulted from the crossroads of shamanic pre-Columbian practices, the meaning of tapirs in tropical South America, and the post-sixteenth-century transfer of Old World ancient pharmacopoeia into the Andes. His essay showed how objects, words, and animals from different traditions were recombined, creating new objects and transferring medical virtues to New World animals – in this case, to the hoof of the South American tapir, imbued with the same curative powers and pedigree that elk’s hooves had in the Old World as a cure for epilepsy.

Whereas contemporary zoologists admit that they do not know where ‘this superstition’ came from, Daniel Gade’s essay recalled that folk medicine, or what today is called ‘ethnomedicine’, is a configuration that has a very complex history that can be written and recovered, including the history of folklorization in Europe of early modern pharmacopoeias and the transfer of names and therapeutic virtues from one natural object to another.⁷⁴ At issue is the

72 Gade, *Nature and culture*, p. 4.

73 *Ibid.*, p. 118. See also Daniel W. Gade, ‘Tapir magic in the Andes and its shamanic origins’, *Journal of Latin American Lore*, 21, 2, 2003, pp. 201–20.

74 Baronti, *Tra bambini*; Porter, *Popularization of medicine*.

general notion about the environmental relationship between animals, people, and diseases, but also the universalization of the different medical systems into which the ‘foreign’ drugs were incorporated.

Animal remedies were ‘part of the story of the Renaissance retrieval of ancient medicine, coupled with its confident assertion of present-day knowledge ... They also form part of the commercial justification for exploration and settlement, being seen as precious commodities.’⁷⁵ Searching for analogies between animals from different continents was not independent of the possibility of trading in those remedies and amulets propagated by the new printing culture. Promoted by both Europeans and New World natives, this culture went hand in hand with the transfer to the natives of the Americas of the sixteenth-century trope that ‘the common people possessed “secrets” ... a body of natural knowledge unknown to the savants’.⁷⁶

More than twenty years ago, the Spanish historian of science José María López Piñero underscored ‘the mestizo (hybrid) cultural condition of the so-called Scientific Revolution’.⁷⁷ Although he was specifically referring to the impact that the hybrid work by Francisco Hernández had on early modern science, this article contributes to his proposition as an analysis of the more complex panorama that emerges from accepting the hybrid nature of knowledge. To paraphrase James Secord: the less local and specific knowledge becomes, the harder it is to see how it travels.⁷⁸

The case of the great beast, far from being unique, could be understood as one of the many examples of this process. One can say that, in a context of epistemological resemblance, names such as *gran bestia* connected animals from different regions on the basis of common virtues and properties. This not-exceptional situation characterized the hybridization process that accompanied the conquest of the Americas. The present article assumes that the transfer of names and the creation of analogies happened more than once and involved regions far beyond Spanish America and the Iberian Peninsula, thus placing the question in the realm of global history. Indeed, the article describes the various scenarios, chronologies, and trading zones that should be taken into account to understand the global uses and transfer of remedies. In particular, it considers the articulation between the Spanish and Portuguese centres – hubs of the commerce with the Indies and Africa, centres of interaction between trade, book printing, propagation of products, and knowledge – and Fennoscandia, propelled in part by the Dutch merchants through the Baltic Sea.⁷⁹

These remedies should be studied not only in the *longue durée* but also in relation to the intricate networks of commerce and the disciplines that structure our current comprehension of human knowledge. Relevant bibliography is scattered through different fields of study: art and archaeology, geology, mineralogy, medicine, alchemy and chemistry, astronomy and

75 Andrew Wear, *Knowledge and practice in English medicine, 1550–1680*, Cambridge: Cambridge University Press, 2000, p. 48.

76 William Eamon, ‘Markets, piazzas, and villages’, in Lorraine Daston and Katherine Park, eds., *The Cambridge history of science: volume 3, early modern science*, Cambridge: Cambridge University Press, 2006, p. 217; Harold Cook, *Matters of exchange: commerce, medicine, and science in the Dutch golden age*, New Haven, CT: Yale University Press, 2007, p. 91. On the ‘unmediated access to the real’ in American culture, see Joshua Bellin, ‘Taking the Indian cure: Thoreau, Indian medicine, and the performance of American culture’, *New England Quarterly*, 79, 1, 2006, pp. 3–36.

77 López Piñero and Pardo Tomás, *Nuevos materiales*.

78 James A. Secord, ‘Knowledge in transit’, *Isis*, 95, 4, 2004, p. 660.

79 Cook, *Matters of exchange*.

astrology, philology, and literature. For this reason, the present article argues for a new investigation into the global and transdisciplinary dimension of objects that may reflect the living remains of a long history of exchanges, translations, and transfers.

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