

## “Seduced by the Thirst for Knowledge” Engelbert Kaempfer’s Scientific Activities in Safavid Persia (1683-1688)

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In the preface to Engelbert Kaempfer’s *Amoenitatum exoticarum politico-physico-mediciarum fasciculi V* (1712) the author emphasizes the fact that the material contained in his work will not simply rehash previous information culled from other travel accounts or books on natural history or science. Instead, Kaempfer will recount his own eyewitness experiences and observations from his travels that took him on a ten-year journey from Sweden through Muscovy and Persia, to India, Ceylon, Java, Siam and Japan from 1683 to 1693: “I have introduced nothing drawn from my own imagination, nothing with the imprint of the study, or the reek of lamp oil. Nor have I re-heated cabbage boiled by others, unless the context requires it, but restrict myself to describing that which is either new or has not been thoroughly and fully recorded by others.”<sup>1</sup> A native German, from Lemgo in

Westphalia, Kaempfer (1651-1716) was not just a world traveller; he was a scholar, medical doctor, and naturalist, renowned as the first European to study Japan scientifically—in particular, Japanese customs and Japanese plants.<sup>2</sup> His descriptions of Japanese flora and medical practices (in the *Amoenitates exoticae*), and his monumental *History of Japan* (published posthumously in 1727 by Johann Caspar Scheuchzer) introduced this “forbidden Empire” to a European audience eager to learn about an unknown part of the world.

The present study, however, will examine Kaempfer’s scientific activities while in Persia. It was during his four and a half years in this country (from 1683-1688) that he honed the skills as a keen observer of natural phenomena and human customs that later stood him in such good stead in Japan (1690-1692). His keen intellect and background as a student of medicine, science, history, law, and foreign languages at a number of European universities prepared him very well for his studies in the Persian Empire. A man of incredible energy, Kaempfer used every available opportunity to record observations that relate to our modern-day disciplines of cartography, botany, biology, ethnography, archaeology, architectural history, medicine...to name but a few.<sup>3</sup> Kaempfer not

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only learned the basics of Persian and Turkish during his stay, he made sketches of cities and archaeological sites, corrected the observations of previous European travellers to Persia, and made numerous discoveries relating to Persian flora and fauna. After a brief overview of his travels and scholarly achievements I will outline some of the most important of his scientific activities while in Persia.

## BACKGROUND AND STUDIES

Engelbert Kaempfer was born in 1651 and grew up as a vicar's son in the Westphalian town of Lemgo. He attended high school in a number of different cities—Hameln, Lüneburg, Lübeck—and finally Danzig, where his dissertation, titled *Exercitatio politica de majestatis divisione in realem et personalem*, was published in 1673. Kaempfer then continued his studies at various cities in the Kingdom of Poland, first in Torun, before enrolling at the Jagiellonian University in Krakow, where he studied philosophy, foreign languages and medicine (1674-76). From there he transferred to the Albertus University in Königsberg (1677), and enrolled as a law student.<sup>4</sup> However, he primarily continued his studies of medicine there and even wrote an (unpublished) manuscript entitled *Physiologia specialis*, dated July 14, 1679.<sup>5</sup> In 1681 Kaempfer abruptly ended his university career in Krakow—without receiving a terminal degree—in order to transfer schools, yet again, this time to the University of Uppsala. The scholars Olof Rudbeck (1630-1702) and Petrus Hoffvenius (1630-82) taught medicine there, and had helped make it the most celebrated of the Scandinavian universities of its day.<sup>6</sup> In Sweden, Kaempfer attended classes on medical subjects, and most likely took advantage of the university's facilities—such as the botanical garden and the large “Theatrum anatomicum,” in which observers could witness dissections being performed.<sup>7</sup> Kaempfer distinguished himself through his studies, made important contacts, and only one year later, in August 1682, he moved to Stockholm. There, he obtained the position of official secretary of a diplomatic and trade mission to Persia.

King Charles XI of Sweden had charged the envoy Ludwig Fabritius, a native Dutchman, with organizing the mission to the Persian court.<sup>8</sup> The monarch hoped to gain access to Persian goods via Muscovy, thus

avoiding the route around the Cape of Good Hope as well as the Dutch monopoly of the trade in silk and spices. In addition, the Swedish ruler hoped to persuade Shah Sulayman to join the European coalition against the Ottoman Turks. This mission was reminiscent of an earlier, unsuccessful mission sent by the Duke of Schleswig-Gottorf to Persia from 1635-1639, which the secretary to the mission, Adam Olearius, had commemorated in his travel accounts, first in the *Offt Begehrte Beschreibung der Newen Orientalischen Rejse* (1647) and then in an enlarged second edition, the *Vermehrte Neue Beschreibung der Muscowitischen und Persischen Rejse* (1656). Kaempfer's scholarly background and many talents had caught the eye of the Swedish organizers of the mission, and the position must have seemed quite attractive to the 30-year old student, who likely considered the future possibilities of advancement at the Swedish court. In March 1683, Kaempfer left Stockholm with the embassy.

## THE JOURNEY

The route of the delegation went from Stockholm to Turku and Helsinki in Finland, to Vyborg and the fortress of Nyenskans (present-day St. Petersburg), to the Estonian city of Narva, before reaching the border of Muscovy. A delay ensued (because the Shah of Persia's name had been placed before that of the Tsar's on the embassy's letters of introduction), but eventually they were able to proceed to Novgorod, where Kaempfer was especially impressed by the large number of monasteries.<sup>9</sup> From the start of the journey Kaempfer wrote detailed journal entries, a kind of rough draft of everything that he found interesting or noteworthy during the voyage. This text, as well as the rough sketches that he included, was meant to serve as notes for an eventual publication of the travel account. When the embassy arrived in Moscow they were granted an audience at the Kremlin with the two tsars, Ivan and Peter (who later became known as Peter the Great). Kaempfer's journal contains meticulous notes about what clothes the rulers wore, the position of their thrones, the ceremony of the event: the author was particularly impressed with the young Peter's bearing and handsome features.<sup>10</sup> During the rest of the stay Kaempfer made observations about Russian food and ceremonial dinners and processions, about Orthodox burials, about his visits to a Russian school,

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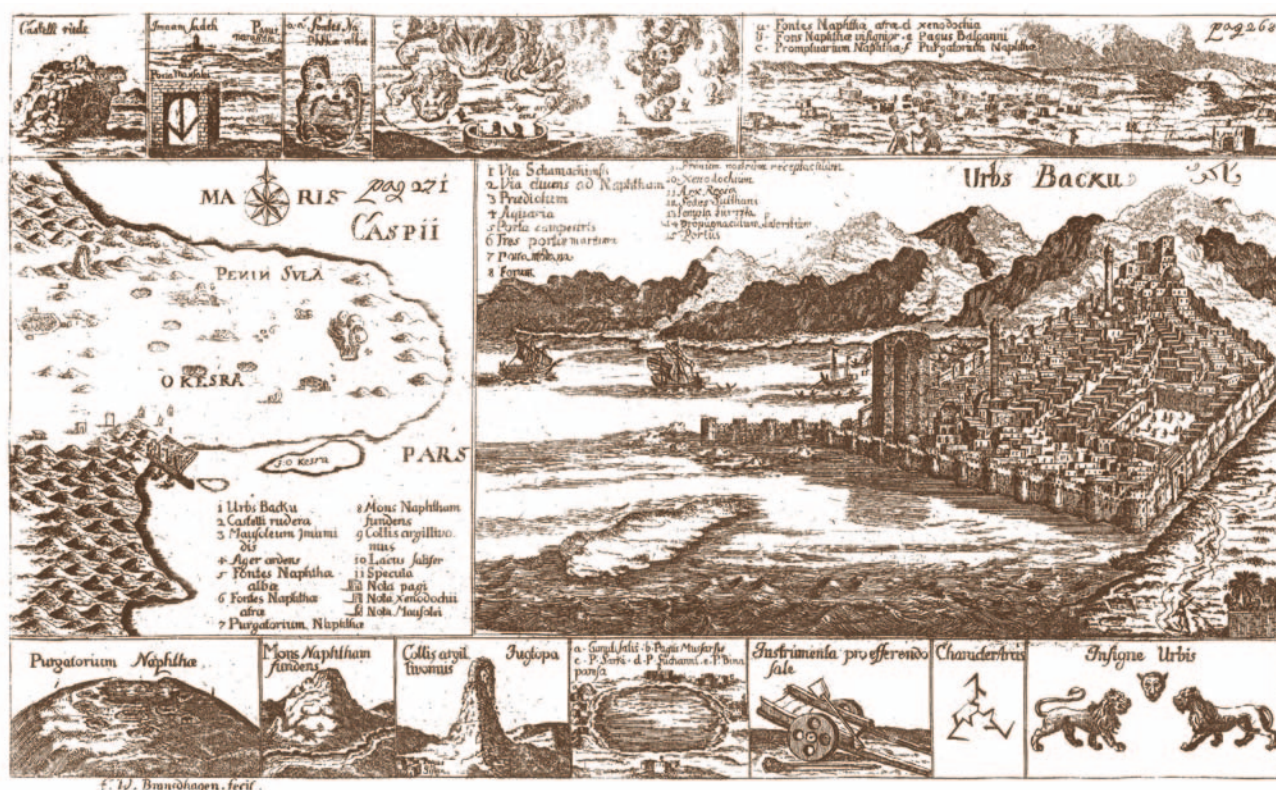


Fig. 1. View of the Apsheron Peninsula and Baku from Engelbert Kaempfer's *Amoenitates exoticae* (1712).

and about a printing press. He writes: "In Russia are many churches and few who come to listen, many drunkards and few tankards, many prostitutes and few houses of prostitution. The following three are under coercion: the bells, the horses and the women."<sup>11</sup>

The embassy continued their journey via Nizhni Novgorod, where they boarded boats that took them down the Volga, until they reached Astrakhan and the Caspian Sea. Using Adam Olearius' travel account and map of the Volga as a guide, Kaempfer made detailed notes along the route downstream, and corrected Olearius' observations on cartography and geography wherever he felt his predecessor had erred.<sup>12</sup> When they reached the Caspian Sea, they sailed along the western coast, and encountered a fierce storm before they landed at Nisabad, in present-day Azerbaijan.<sup>13</sup> Kaempfer visited ancient ruins in the vicinity, and later climbed the mountain of Barmach—as Olearius had done—where the prophet Elijah had supposedly lived as a hermit. From there the embassy went to Shemakha, where they had to wait three months for the Shah's permission to continue into Persia. Kaempfer spent the time meeting with the local

mullah (who, it turns out, had instructed Olearius in the fundamentals of the Arabic script some 45 years earlier). He also ministered to patients, who hounded him because of his skills as a doctor. At the end of his stay Kaempfer was able to steal away for a few days with a companion, an interpreter and two guides, in order to visit the Apsheron Peninsula (which he named *Okesra*) and the city of Baku. There he described the natural wonders he encountered, such as the "land that was burning."<sup>14</sup> He then wrote about the sources of black and white naphtha and other geological features that were included in an engraving of Apsheron and Baku in the *Amoenitates exoticae* (Fig. 1).<sup>15</sup> Kaempfer also observed that the bituminous taste of the sea water was probably due to the fact that underground naphtha wells flowed into the water. Although the party had some unwished-for adventures—at one point they were suspected of being spies—Kaempfer was able to make detailed sketches of the city before returning to Shemakha.

After receiving the Shah's permission to continue their journey, the Swedish embassy made its way to the Caspian coast, and followed established caravan routes,



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passing through Lenkoran, Astara, Rasht, Qasvin, Qum, and Kashan, until they reached the capital, Isfahan, on March 30, 1684.

## IN PERSIA:

## ISFAHAN AND THE PERSIAN GULF

On the advice of his astrologers, Shah Sulayman declared a four-month waiting period before he would receive the Swedish legation. Kaempfer used this delay to his advantage, making detailed observations of the capital's architectural wonders: the buildings and parks, the celebrated *maidan* (royal square), and the impressive bridges (Fig. 2). He also described Persian customs and clothing, and life at court (including its structure, the powers of the Shah, a description of the royal harem, the make-up of the military and the state's finances).<sup>16</sup> Crucial to this enterprise was the friendship he struck up with the Capuchin friar Raphaël du Mans (1612-1696), who sometimes interpreted for the Shah and had lived in Isfahan for 38 years.<sup>17</sup> Du Mans provided Kaempfer with valuable "insider"

information about the Shah and his court, and of the inner workings of the empire—to the point that he even wrote a personal *Descriptio Persiae* (1684) for the German doctor. This was an updated version of an account, *Mémoire de la Perse*, which he had written for the French minister Colbert in 1660. The priest also helped Kaempfer learn the basics of Turkish (the language of the court), as well as Persian (the literary language). A number of extant letters<sup>18</sup> attest to the fact that the two men were on very good terms, and that Du Mans also provided friendly advice even after the German left the capital.

Kaempfer decided that he did not yet want to return to Europe with the Swedish embassy, and attempted to secure a position with the Dutch East India Company (VOC).<sup>19</sup> After writing a number of petitions (e.g. to the Dutch admiral Casembrood, and to Herbert de Jager, a doctor and naturalist stationed in Batavia with the VOC, whom he had met in Isfahan), and with the help and advice of Fabritius and Du Mans, he was finally granted a position in December 1684 as *Oppechirurgyn* (Head Surgeon) by the Director of

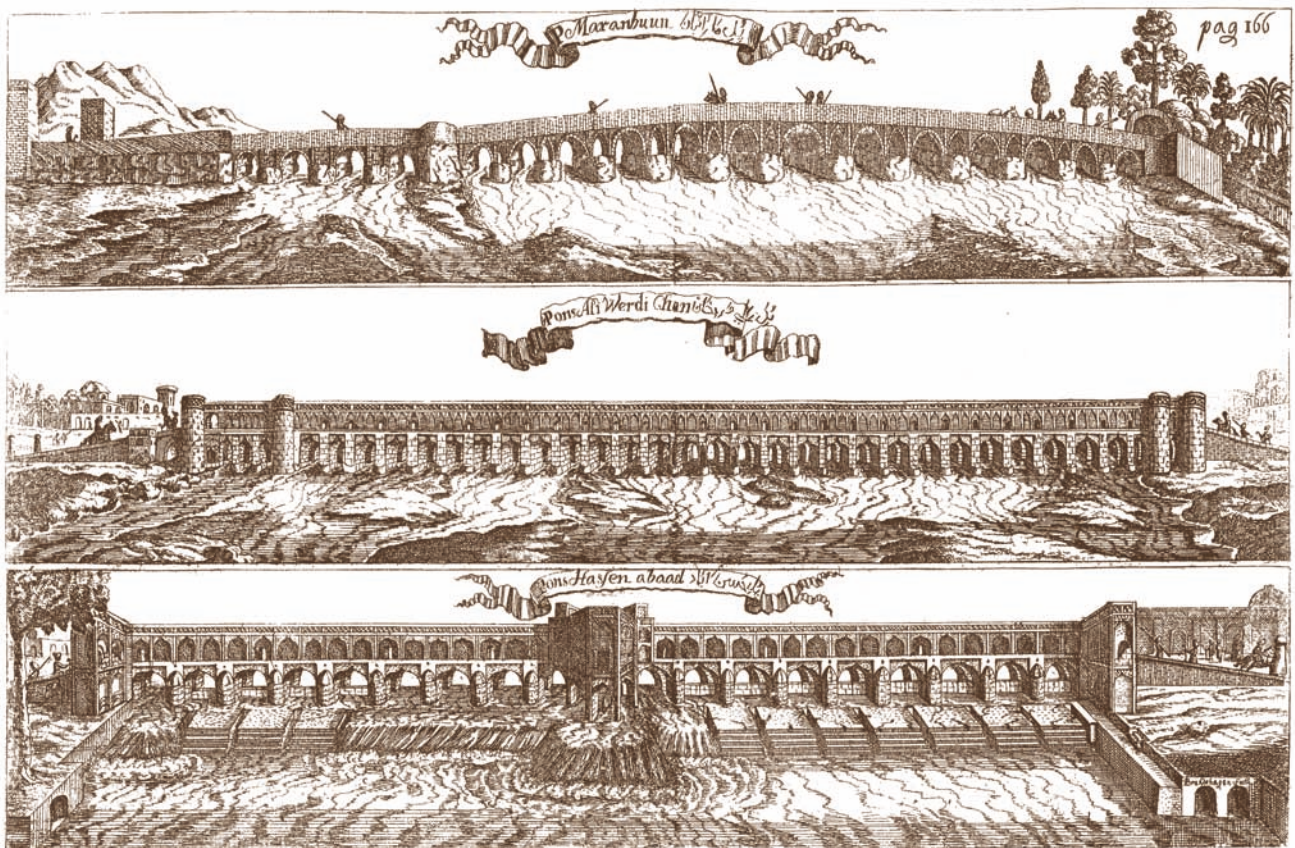


Fig. 2. Bridges of Isfahan from Engelbert Kaempfer's *Amoenitates exoticae* (1712).

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the Dutch factory in Gamron, Justus van den Heuvel. However, Kaempfer had to wait almost one year before leaving the Persian capital for his new post on the Persian Gulf, and thus spent his time writing a treatise on Persian plants and drugs.<sup>20</sup>

The highlights of Kaempfer's trip from Isfahan to Gamron (present-day Bandar Abbas) were his detours to the ancient ruins of Persepolis and Naqsh-e Rostam, where three days of intense activity resulted in a number of depictions of reliefs, columns and inscriptions. He also visited and sketched the tombs of the Persian poets Sa'di and Hafiz in Shiraz, before arriving on Dec. 28 1685 "to the town of Gombrun, the port of Hormuz, which is world-famous and praised as blessed throughout Persia but is in reality the most barren, driest, hottest, most poisonous, unhealthiest, most cursed place in the world and nearest to Hell..."<sup>21</sup> Kaempfer's initial impression of the area was prescient: he too fell seriously ill, and his superior at the Dutch trade mission did not want to give him permission to leave his post and recuperate in a more salubrious environment. Finally, through the intercession of the VOC's special commissioner for India, Wibrand Lycochthon, Kaempfer was finally allowed to escape to the cooler hills above Bandar Abbas, in Bugun, where he convalesced to the point that he was able to go hunting for a mountain goat (in the hope of finding a bezoar stone in its stomach). During his two-and-a-half year sojourn on the Persian Gulf and brief visits to neighbouring areas, Kaempfer wrote observations on Persian fauna and flora: e.g. on medicinal plants, on the *Asa foetida*, and an entire treatise on the date palm, *Palma arbor* (which he calls *Phoenix persicus*), and the various stages of the date harvest. He also recorded the symptoms and treatments of various tropical illnesses that he encountered in his work as a doctor. In addition, he compiled cartographic information and worked on providing a more accurate map of Persia and the Persian Gulf.

## JAPAN AND RETURN TO EUROPE

On June 30, 1688, after more than four years in Persia, Kaempfer finally left Bandar Abbas on a VOC ship. His journey took him to Muscat, then across the Indian Ocean to the Malabar<sup>22</sup> and Coromandel Coast of India, around Ceylon to Java. Since his attempts to secure a position in the VOC hospital in Batavia were unsuccessful, he decided to accept a post as VOC

physician in Japan, where (after a stopover in Siam<sup>23</sup>) he arrived in September 1690. There Kaempfer spent two years on the artificial island of Deshima, off the coast of Nagasaki.<sup>24</sup> With the help of a Japanese interpreter, Imamura Eisei (Gen'emon),<sup>25</sup> Kaempfer was able to collect information on Japanese customs, medicinal practices, and, in particular, flora—an enterprise that had to be carried out in secret, since the Japanese authorities had prohibited foreigners from collecting and disseminating such information. After two visits to the Shogun in Edo (the later Tokyo) he was also able to make a new map of Japan.<sup>26</sup>

At the end of his stay in October of 1692, Kaempfer was able to smuggle his many materials—including books, maps, manuscripts and exotic rarities—out of Japan. The VOC ships stopped off in Batavia first, and continued from there to the Cape of Good Hope. They reached Holland in October of 1693, and Kaempfer finally set foot on European soil again, more than ten years after his departure from Sweden. A few weeks after his arrival in Amsterdam, Kaempfer registered at the faculty of medicine in Leiden. His dissertation (*Disputatio medica inauguralis exhibens decadem observationum exoticarum*) was published at the beginning of 1694, and a few months later he received his doctorate in medicine. Unable to find employment in the Netherlands,<sup>27</sup> Kaempfer returned to his home, and settled down in Lieme, near Lemgo. There he practiced as a physician and started preparing his notes for publication. An appointment in 1698 as "physician in ordinary" to Friedrich Adolph, Count of Lippe, meant a permanent position, but also more headaches. Two years later Kaempfer decided to marry the daughter of a rich merchant, perhaps hoping to live off of the anticipated dowry and have more time to work on his book projects. His wife, Maria Sophia Wilstach, who was only sixteen at the time of the marriage, gave birth to three children, all of whom died of smallpox. Their marriage was an unhappy one, and Kaempfer's final years before his death in 1716 seem to have been marked by family strife to the very end.

## THE AMOENITATES EXOTICAE

However, the year 1712 marked the publication of Kaempfer's *Amoenitates exoticae* (Exotic Pleasures). It was over nine hundred pages long, written in Latin, and

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contained numerous copperplate engravings (although Kaempfer complained bitterly about the bad quality of work done by the engraver).<sup>28</sup> The work was divided into five fascicles, entitled: "I. Relationes de aulae Persicae statu hodierno (Reports Concerning the Present State of the Persian Court); II. Relationes et observationes historico-physicas de rebus variis (Historico-Physical Reports and Observations Concerning Various Things); III. Observationes physico-medicas curiosas (Curious Physico-Medical Observations); IV. Relationes botanico-historicas de Palma Dactylifera in Perside crescente (Botanico-Historical Reports Concerning the Palma Dactylifera Growing in Persia); and V. Plantarum Japonicarum...nomina... (Catalogue of Japanese Plants)."<sup>29</sup>

In the introduction to the *Amoenitates*, Kaempfer explains that he has only provided a "sampling" of his wares. He explains that he has three more manuscripts which he has prepared for publication: "1) Japan in Our Time, 2) Specimen of a Trans-Ganges Herbarium, 3) Journey in Three Parts."<sup>30</sup> In fact, after Kaempfer's death, a manuscript of his work on Japan ended up in the possession of Hans Sloane in England, who in turn charged his Swiss secretary, Johann Gaspar Scheuchzer (1702-1729) with translating the work. It was published in London in 1727 as *The History of Japan*, and was an immediate success. "Some twelve editions and translations were published in the next decade alone, and as a result the European image of Japan rested on Kaempfer's account."<sup>31</sup> On the basis of his work on Japan, as well as his observations on Persia (and other countries), Kaempfer achieved a—primarily posthumous—recognition in Europe as a celebrated explorer and man of letters.

## KAEMPFER'S SCIENTIFIC ACTIVITIES IN PERSIA

### BOTANY

Botany was the discipline to which Kaempfer devoted most of his scholarly energy, and indeed throughout his entire stay in Persia he spent a great deal of his time in the description and classification of Persian flora. Kaempfer produced two manuscripts on Persian plants that included detailed descriptions and illustrations, one written during his stay in Isfahan (*Plantarum Persicarum Rudis tam delineatio quam descriptio Eng. Kempfer. Tom. 1, Isphahani 1685 Mense*



Fig. 3. The Scythian lamb or Borometz fruit from Jean Bauhin's *Historia plantarum universalis nova et absolutissima* (1650-51).

May);<sup>32</sup> and the other while living in Bandar Abbas (*Another volume containing the description and design of plants observed by Dr. Engelbert Kempfer in Persia, chiefly about Gamron. Done by himself on Persian paper in 1687, 1688*).<sup>33</sup> In addition he produced a description of Persian medical plants (*Prostantia Pharmaca*);<sup>34</sup> as well as a listing of Persian drugs (*Memoria inquirendorum in Persia Simplicium*).<sup>35</sup> However, none of these works was published during his lifetime. They have not yet appeared in print.

The works on Persian fauna that Kaempfer was able to publish were the sections in the *Amoenitates exoticae* on "The Scythian Lamb, or the Borometz Fruit" and his "Report of Disguun Asafetida" (both of which are located in Fascicle III of the *Amoenitates exoticae*);<sup>36</sup> as well as the entire Fascicle IV, which is devoted to a history of the date palm.<sup>37</sup>

His observations on "The Scythian lamb, or the Borometz fruit" concern a myth about a zoophyte, that is, a plant-animal, or a plant that was supposed to possess animal qualities. According to the legend—which had been known in Europe since the Middle Ages—there existed, in Tartary or near the Caspian Sea, a plant known as the "borometz" or "barannetz" that grew in the shape of a lamb (Fig. 3). The plant "is covered with a very fine skin (which the inhabitants remove and use for head coverings), feeds on grass, and is devoured by wolves."<sup>38</sup> After conducting inquiries in the area, Kaempfer comes to the conclusion that no such plant exists. He speculates that the word "borometz" is related to the Slavic word for sheep, "baran," (or "barreh" in Persian) through its diminutive form "borannetz,"



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Fig. 4. Asafoetida plant from Engelbert Kaempfer's *Amoenitates exoticae* (1712).

which is derived from the Russian spoken in Moscow.<sup>39</sup> He goes on to describe characteristics of the “karakul” sheep, a breed found around the Caspian and as far away as the Persian Gulf (Basra). The skins of little lambs (and even fetuses) of this breed were prized for their delicate wool, which was used on the borders of robes and cloaks and made for the upper classes. Kaempfer concludes that this is how the fable was passed on: namely, that these skins were taken to far-off lands, and that the true explanation of their origins was misunderstood or lost over time. Robert Carrubba cites a 19<sup>th</sup>-century study—Henry Lee’s *The Vegetable Lamb of Tartary: A Curious Fable of the Cotton Plant* (London, 1887)—that acknowledges Kaempfer’s ingenuity, but that contends that the fable actually had to do with the cotton pod, and “the similarity of cotton and wool, and the misunderstanding of such figurative phrases as ‘fleece that grows on trees...’”<sup>40</sup>

The other Persian plant that Kaempfer discusses in detail in Fascicle III of the *Amoenitates* is the “hingisih” or asafoetida, prized for its sap from which a malodorous drug is produced (Fig. 4). This medication was used for colics of the stomach and lower intestines

by pharmacists both in the Middle East and in Europe. Kaempfer’s description of the asafoetida begins with a botanical description of the plant: its nomenclature, where it grows, its root system, the appearance of its seeds, how its sap is collected, and its most striking characteristic of its leaf: “its taste is goatlike with bitterness and an aromatic sharpness.”<sup>41</sup> The author goes on to note that “because of its horrid stench, the Germans call it *Teufel’s Dreck*, that is, devil’s dung.”<sup>42</sup> In the second section of his disquisition Kaempfer provides the various names that the plant has been given over the ages. He cites sources from antiquity (Dioscorides, the Roman physician from the 1<sup>st</sup> c. AD); the middle ages (the Persian physician Avicenna, or Ibn Sina, 980-1037); and more recent scholars (such as Pietro Andrea Mattioli, 1500/01-1577). Kaempfer also observes that the eminent Julius Caesar Scaliger (1484-1558) and Claude Saumaise (1588-1653) were mistaken in their descriptions of the plant, and that he, Kaempfer, will “record an authentic report of the plant.”<sup>43</sup> The author notes that he has travelled to the mountains in the province of Lar, near the Persian Gulf, and that he personally witnessed the cultivation of the plant and the collection of the sap in 1687. He then compares this variety of asafoetida with the one that grows near Herat. Sections 3 and 4 discuss the attributes of the plant (“The stench is an index of excellence; the stronger the stench, the better the asa”<sup>44</sup>); and the harvest of the sap by the citizens of Disguun. Kaempfer includes an engraving of the plant and of the various stages of the harvest (Fig. 5), and enjoins the reader: “For clarity, the reader should consult the illustration, which shows a tract of the hingiferous mountain large enough for harvesting by a single group. In the illustration, the letter A indicates the first location and class of roots; the letter B indicates the second...”<sup>45</sup> This brief overview gives an idea of Kaempfer’s methodology: he gives a context for his subject of inquiry along with the scholarly sources, but then he does not hesitate to criticize those sources and provide his own eyewitness account of the subject.

Fascicle 4 of the *Amoenitates exoticae* is Kaempfer’s account of the date palm, which he terms “Phoenix persicus.”<sup>46</sup> The German author provides “a work of great value to the cultural history of southern Persia.”<sup>47</sup> He describes the plant, examines the origin of its name, then lists the conditions for its growth and the various stages of the date harvest, including the celebrations



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Fig. 5. Cultivation of the asafetida plant from Engelbert Kaempfer's *Amenitates exoticae* (1712).



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held after the harvest (Fig. 6). This leads him to a description of the musical instruments used during the festivities (cymbals, drums, tambourines), and even the types of dances performed during the celebrations. He even notes the practice of capturing locusts, which the participants then consume.<sup>48</sup> The German doctor also discusses the medical uses of dates: for instance, to treat patients with coughs, dates can be added to a *Decoctum pectorale*, *Syrupus de Hysopo*, *Syrupus resumptivus*; and they can help against kidney and bladder pain.<sup>49</sup>

As Wolfgang Muntzschick has observed, “Scientific botany was in a transitional phase around 1700. The naturalists of the Renaissance had been especially interested in identifying and rediscovering plants that had been described by the classical authors... In contrast to this traditional trend, however, in the late 17<sup>th</sup> century there was a prevailing endeavour to collect, describe and name as many plant species as possible—thus also those that had been unknown in antiquity.”<sup>50</sup> Kaempfer fits into this new category of naturalists, in that he wanted to include in his writings only the descriptions of Persian plants that were unknown in Europe and not contained in such standard works as Prospero Alpino’s study of Egyptian plant life from

the late 16<sup>th</sup> century.<sup>51</sup> Kaempfer’s contemporaries in this field included Joseph Pitton de Tournefort (1656-1708)—who “travelled to Greece and Asia Minor in order to rediscover the plants of Dioscurides in their native sites”<sup>52</sup>—and the Englishman John Ray, author of a *Synopsis methodica avium & piscium...* (London, 1713).<sup>53</sup>

During his stay in Isfahan, Kaempfer befriended Herbert de Jager (1636/37 – 1694), a senior merchant at the VOC, who had studied at the University of Leiden with the celebrated scholar Jacobus Golius (1596-1667). Through De Jager—who was known for his understanding of Persian and Malaysian, and for his botanical studies—Kaempfer was eventually able to become part of an unofficial “network of botanists” at the VOC.<sup>54</sup> This group consisted of members of the Company, who had a decided interest in collecting, describing, analyzing and then publishing reports about the plant life to be found at the various VOC factories and outposts around the world. Their main interest lay in the medicinal and botanical properties of plants (and their practical application in producing medicines and drugs that could be used by the VOC personnel). But the practical applications were only

Fig. 6. Cultivation of the date plant from Engelbert Kaempfer’s *Amoenitates exoticae* (1712).



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part of the equation, and some of the publications by these botanists resulted in massive compilations that went far beyond the basic medicinal properties of the plants. Members of this network included the physician Andreas Cleyer (1634-1697/98), who was chief pharmacist at Batavia; Hendrik Adriaan van Reede tot Drakenstein (1636-1691), who produced the 12-volume *Hortus Malabaricus* (published between 1678-1693); Georg Everardus Rumphius (1628-1702), who worked at Ambon and wrote the *Hortus Indicus Malabaricus* (1678); and Paul Hermann (1646-1695), who studied the plants of Ceylon.<sup>55</sup>

## ZOOLOGY

Kaempfer's observations on Persian fauna were not nearly as extensive as his description of the country's flora; he did, however, provide a basic overview of the animals he encountered, especially those that were not well known in Europe.

In Fascicle III of the *Amoenitates exoticae*, he provides an account of "The torpedo of the Persian Gulf," a type of electric ray.<sup>56</sup> Our author notes that "as in the Latin language, the names of the torpedo fish in Persian and in Arabic are derived from the numbness that it inflicts upon anyone who touches it. The Persian name is *lers mahii*; the Arabic is *riaad*."<sup>57</sup> The first part of the essay describes the anatomy of the fish: "The torpedo's exterior is slippery and has no scales...[and is] marked by a variety of spots: white and dark spots on the back... [The] stomach is white...Each eye is equipped with two eyelids positioned nearly in line with the long axis of the back."<sup>58</sup> An accompanying woodcut (Fig. 7) depicts the torpedo's back (=A); its stomach (=B) and the abdomen of the female (=C), which shows eggs situated on both lobes of the liver, and the animal's "heart, whose shape is precisely that of a fig... freely suspended in the small pectoral cavity."<sup>59</sup>

The second section deals with the "Faculties" of the Persian torpedo. Kaempfer describes how it differs from the Mediterranean torpedo (that "has been correctly described by Aristotle, Pliny and Galen"<sup>60</sup>); and, in particular, its effects when handled by humans: "The torpedo emits its power with a sort of momentary belching or a certain convulsive motion of the viscera, whereby it dilates the spiracles of the abdomen and absorbs air: with the same effort it simultaneously thrusts out its dreadful virus into the

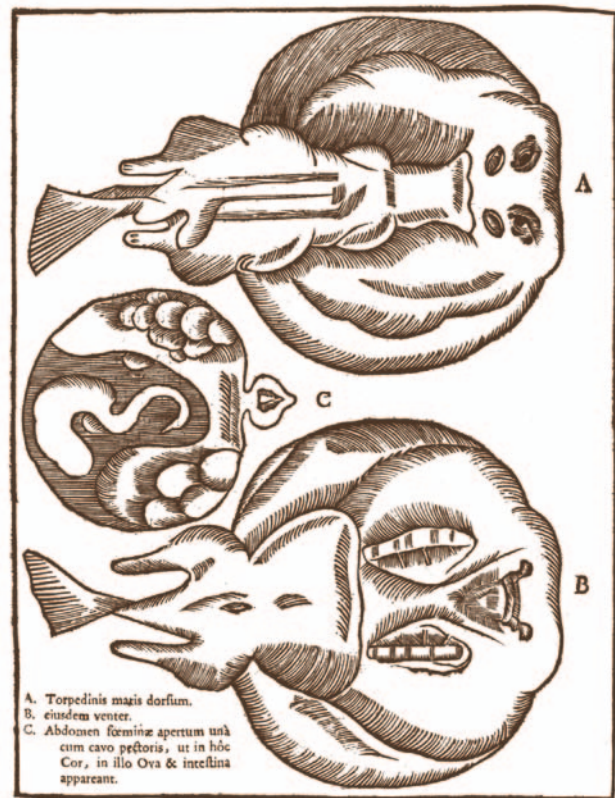


Fig. 7. The torpedo ray from Engelbert Kaempfer's *Amoenitates exoticae* (1712).

air."<sup>61</sup> Ever the doctor and careful scientist, Kaempfer is especially interested in relating the symptoms that the fish produces in humans: "The numbness induced is not the sort felt in a sleeping limb, but a sudden condition that instantly travels through the touching part and penetrates the citadel of life and breath. Then it overwhelms the whole body and mind...And all of this is accompanied by a shudder of the heart, a trembling of the limbs, a numbness, and a chill. So powerful and so swift is the force of the horrifying exhalation that like a chill bolt of lightning it shoots through the handler."<sup>62</sup> It seems that Kaempfer was the first writer to compare the effects of the torpedo to electricity. He also suggests that while handling a torpedo fish one should hold one's breath—then no harm will come to the person holding it.

When Kaempfer became very ill and had to escape the oppressive heat of Bandar Abbas, he travelled north to the mountains, where he spent some time recuperating in the area near the village Buguun, which lies in a valley of Mount Bennà.<sup>63</sup> Since there were numerous wild "bezoar goats," known as *pasèn* (Pâsân)<sup>64</sup> living in the nearby mountains, Kaempfer hired some



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hunters to lead him to the animals. The hunt resulted in their killing one such goat in whose stomach they found a bezoar stone, which was “as long as a thumb, cylindrical, black and completely smooth.”<sup>65</sup> Although the stone was supposed to possess medicinal properties, Kaempfer is quite reserved in discussing its effects—but he does admit to having produced a “*liquor bezoarticus*.”<sup>66</sup> He also describes other wild animals that live in the region, such as “*paleng*, the leopard” (which was well known, and thus does not warrant an exhaustive report; he merely notes that the Persian variety is “less dangerous than the leopard of Africa and East India... To such an extent does the mildness of that sky even correct the wildness of the beasts.”<sup>67</sup> Kaempfer also mentions the “golden wolf... *sjechaal* in Persian, in English the *jackal*, in Belgian/Dutch the *jakal*,”<sup>68</sup> which is “well known from travel accounts because it inhabits almost the entire Orient... they are numerous around the shores of the Caspian Sea.”<sup>69</sup> Jackals even “stole leggings, shoes and other leather goods from the tents that we had set up near the Caspian Sea. Whatever was too heavy for them to carry off we found not too far from our sleeping places.”<sup>70</sup> The *sichuur*, or porcupine, “is wild and is described by several authors,”<sup>71</sup> and “*chirs*, *ursus*, the bear... is smaller than the European one... and lets itself be domesticated.” Kaempfer notes: “In Isfahan I saw two of them who walked about the city without a guard, bothering those who were eating unless they were given a morsel; they could not be chased away by blows because they belonged to the

King.”<sup>72</sup> The animal that merits the most attention is the “*kaftaar*, i.e. *taxus porcinus* or the hyena of the ancients” since it “is unknown in the West.”<sup>73</sup> Kaempfer calls it a “wolf-pig” or *taxum porcinum* since its head, tail and feet resemble that of a wolf, whereas the size of its body and shape of its belly are similar to that of a pig. He notes the animal’s *ingenium* (intelligence), ferocity and its carnivorous nature—it even digs out cadavers from cemeteries at night, a trait already noted by Pliny.<sup>74</sup> Kaempfer had a female hyena captured so that he could observe it more closely. He also notes that the naturalists Ludolfus, Gesner, Jonston and Aldrovandus all gave the name *papio* for “hyena,” but Kaempfer insists that it should be called *taxum porcinum*.<sup>75</sup> An accompanying engraving (Fig. 8)<sup>76</sup> shows four of these animals against a background of the natural habitat in which they live. On the left side of the image we see a male and female *ahu* (a type of deer), and two bezoar goats (*pasèn*) depicted in a moment of procreation. A jackal (*sjechaal*) is located in the bottom right corner, and a hyena, *kaftaar*, the least well-known of the animals, is the largest animal in the engraving, which even depicts a close-up of its face and elongated neck.

## CARTOGRAPHY

Kaempfer was engaged in various cartographic activities throughout his travels. Throughout the journey down the Volga, he made detailed observations in his journal, noting the changes in the river’s course, and the latitude and longitude of the river. He used Adam Olearius’ map of the Volga as his model, and sought to correct the errors that he discovered in it. As was the case with Olearius, Kaempfer was only able to sail along the part of the west coast of the Caspian Sea, thus the information he gathered for his manuscript map of the Caspian<sup>77</sup> was derived from conversations with other travellers, native informants and other sources. Margarete Lazar, who has done extensive research on Kaempfer’s maps (both in published and in manuscript form), notes that a marked similarity exists between Kaempfer’s map of the Caspian and a map copied by Nicolaas Witsen of 1665, although “neither Witsen nor Kaempfer mentions exchange of maps on the Caspian Sea.”<sup>78</sup> Noteworthy elements of Kaempfer’s depiction of the Caspian include the North-South extension of the Sea, and the fact that the Apsheron peninsula is missing (even though Kaempfer had visited Baku, which is located on the peninsula).

Fig. 8. Animals from southern Persia from Engelbert Kaempfer’s *Amoenitates exoticae* (1712).



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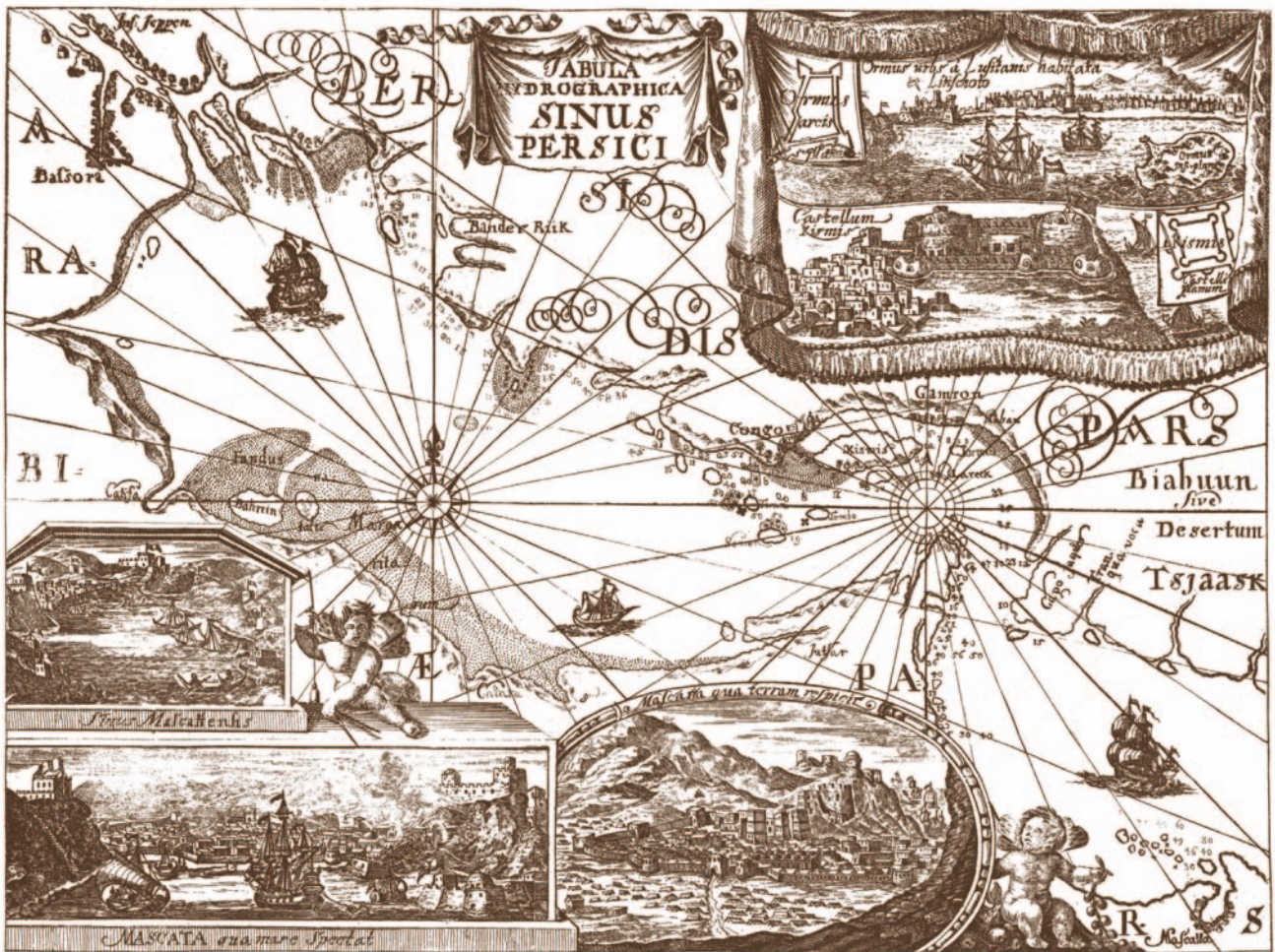


Fig. 9. *Sinus Persici* (Persian Gulf) from Engelbert Kaempfer's *Amoenitates exoticae* (1712).

Kaempfer also prepared a manuscript map that portrays the route the Swedish embassy took: from Tarku, along the Caspian shore, via Shemakha, Rasht and the southern Caspian coast, across the Sefid Rud River (= Kizil Usun), to Qum, and finally into Isfahan.<sup>79</sup> Our author does not seem to have made a route map of his travels from Isfahan to Bandar Abbas, but while in the latter city he prepared manuscript drawings of the Persian Gulf,<sup>80</sup> which were used to make the copperplate-engraving map “*Tabula Hydrographica Sinus Persici*” (Fig. 9), which is included in the *Amoenitates exoticae*.<sup>81</sup> On this elaborate map, the elongated Gulf has an East-West extension: The upper right-hand corner contains depictions of Hormuz and Kismis (Qeshm), along with schematic drawings of the forts located on each island. The bottom left has three inset representations devoted to Mascata (Muscat): views of the Gulf of Muscat, and

views of Muscat facing the sea and the land. The map contains two prominent wind roses, and indications of depth off the coast of Muscat, along the coast of Oman, and then all along the northern shore, from Jask to the Shatt-al-Arab. The western and southern coasts have no indications of depth, nor is there any notion of the Peninsula of Qatar.

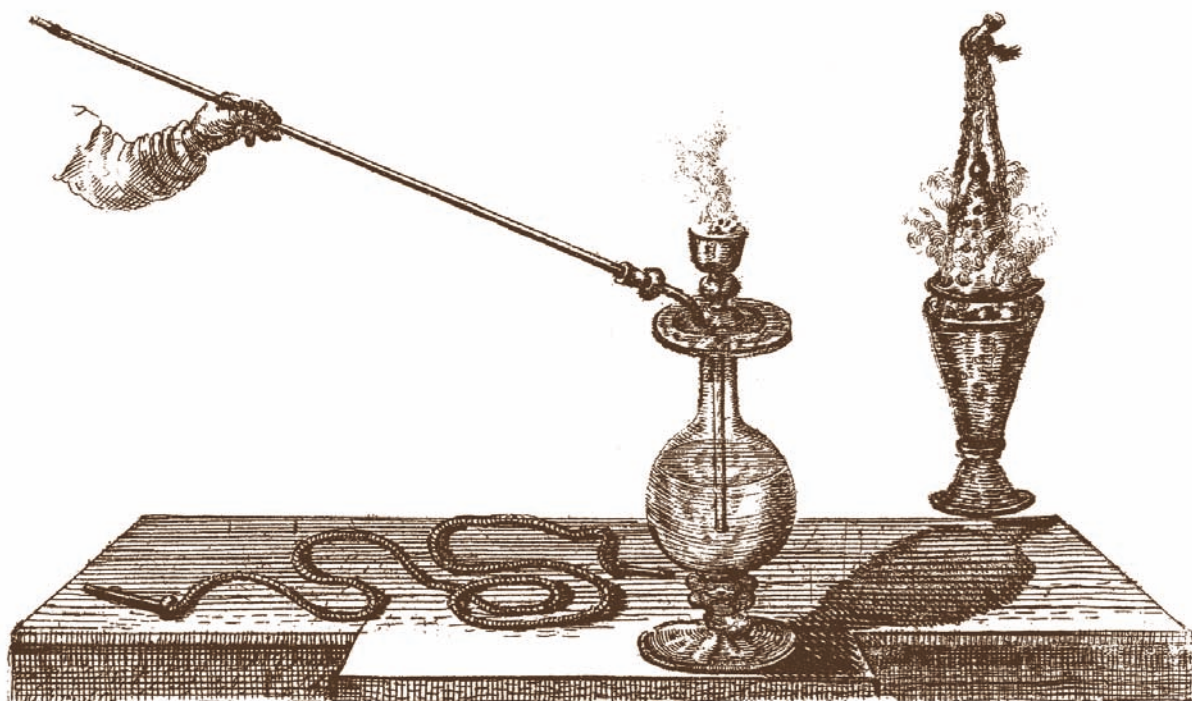
Lazar suggests that his model for the Persian Gulf map was most likely a map by the Dutchman Jacob en Casparus Lootsman, in particular “*Dascaerte Van't Westelyckste deel van Oost Indien*.”<sup>82</sup> She goes on to suggest that Kaempfer's map, as well as British sources, were in turn the sources for Frenchman Jean-Baptiste d'Anville's representation of the Gulf, in his “*Carte d'Asie*” (1751-53).<sup>83</sup> While stationed at Bandar Abbas, Kaempfer wrote to Nicolaas Witsen, and informed him of his desire to make a “more accurate geographic



*Fasciculus III.*

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claudit orbiculus æneus, in sesquipalmarem diametrum expansus, duos in medio permittens *tubulos* invicem adsolidatos, æneos; *Unum*, cujus inferior pars in ampullam demissa, aquæ immergitur; superior recipit nicotianæ cum impositis carbonibus retinaculum, infundibulo seu buccinæ orificio simile: • *Alterum* brevior, cujus de-



missa extremitas aquam non attingit: superior incurvata arundinem excipit longam, qua fumus attrahitur. Tubulorum propago, proximè sub orbiculo, telâ xylinâ arctè circumvoluta est, in eam crassitiem, quæ vitri orificium cum modicâ colli parte expleat atque claudat arctissimè: Ita evenit, ut ad suctum non possit nisi ex infundibulo fumus succedere; qui jucundo strepitu aquam penetrans, primò inanè vitri spatium occupat, inde per arundinem

Mm mm

dinem

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map of Persia;<sup>84</sup> however, Kaempfer was not able to publish such a map in his lifetime, leaving behind only manuscript maps of different parts of Persia.

## TROPICAL MEDICINE

Kaempfer's profession as medical doctor naturally made him especially interested in native medicines and drugs, and the subjects of tropical diseases and their cures. Observation III (in Fascicle III of the *Amoenitates exoticae*) discusses "Muminahi, or Native Persian Mummy."<sup>85</sup> This is "a bituminous liquid that exudes from the surface rock of a mountain;"<sup>86</sup> it was incredibly precious and supposedly possessed wondrous healing properties. "In the opinion of the people, this is the genuine and authentic mummy of the ancients with which the early Egyptians preserved the bodies of their leaders, with the result that our people termed the bodies themselves mummies. The same term was then retained for the artificial balsam that is made from spices and is used as a substitute for genuine mummy in preserving corpses."<sup>87</sup> Kaempfer describes how and where "primary" and "secondary" mummy is collected: the former is the more precious one reserved for the king, which is supposed to be "superbly effective for uniting bones,"<sup>88</sup> whereas the latter can be obtained more easily and is less effective. Ever the scientist, our author conducts an experiment whereby he breaks the leg of a young fowl, applies some secondary mummy (= balsam) to the fracture, and pours some more of the balsam down the animal's throat. The next day the fowl seems to be back to normal, and has only a slight limp. But after Kaempfer dissects the leg he discovers that it is still fractured, thus no miracle cure had ensued.

One particular medical problem that Kaempfer encountered during his stay in Bandar Abbas was "The Persian *dracunculus* on the Coast of the Persian Gulf," a description of which can be found in Fascicle III of the *Amoenitates exoticae*.<sup>89</sup> Here the author methodically describes a medical problem, gives its history, and then explains his treatment of it.

The *dracunculus* is "a unique type of worm that is bred not in the intestines but in the muscles on the exterior of the body."<sup>90</sup> The first section of the essay deals with the question of nomenclature: Latin physicians gave this medical problem the name *dracunculus* ("small serpent"), since the worm resembled a serpent moving under the skin, or because

it coiled itself around the muscles. Kaempfer also mentions Avicenna, who used the term *Irk Medini* (Medina nerve), which was incorrectly translated by Gerard of Cremona as "Medina vein."<sup>91</sup> Avicenna labelled it a nerve or vein, but Kaempfer actually twice withdrew a *dracunculus* from the scrotum of a patient (from an African and a Persian) and noticed that "both worms displayed spontaneous motion and life."<sup>92</sup> He even placed the worms in cold water and observed—along with two other witnesses—that they displayed sensations of pain, since they raised their heads out of the water and curved themselves in different directions. A description of the worm follows: it is white, can be a foot long or more, about as thick as a lute string, and it has a kind of white beak or beard above a mouth and eye.<sup>93</sup>

Kaempfer goes on to discuss where one finds the "little beast," namely in Persia, African Guinea, Arabia, Egypt and even near the Ural River, all lands that are very hot. Water is often brackish in those areas, and the inhabitants follow the practice of collecting rain water in cisterns. The German physician describes from what parts of the body he has extracted these worms: usually from the lower leg—soles of the feet, kneecaps—but occasionally from other parts of the body (arms, hips). Kaempfer goes on to explain how one should extract the *dracunculus* from the patient, a procedure which can take anywhere from a few days up to more than twenty days, if the worm breaks and re-enters the body. Sometimes a worm can lie dormant for a year or more before symptoms appear. Section V, which follows, concerns the "seminal principle," namely how the worms reproduce. Here the author evokes such authorities as Aristotle, Pliny, and a contemporary physician, Steven Blanckaert (1650-1702).<sup>94</sup> Kaempfer asserts that the "seminal principle resides in...rain wash and not in the air or food"—in other words, from the stagnant reservoir water that people drink. The final section, VI, describes how to cure the problem.<sup>95</sup> Normally when an ulcer forms at a point of exit, one end of the worm can be grasped and wound around a small stick, and then—over a period of time—it can be carefully drawn out of the wound, although sometimes too much force is applied and the worm breaks off and re-enters the body. When the *dracunculus* has been removed, the natives wash the ulcer with cold water for a few days, and it heals quite quickly. Kaempfer seems to endorse this native method, since it seems to accord



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well with the hot climate (as opposed to European methods of treating such wounds).

Kaempfer is also very interested in the drugs, medical potions and intoxicants that the Persians use. In “Observation XV—*Kheif*, or *Keif*: Persian and Indian Intoxicants,”<sup>96</sup> Kaempfer reviews “the three most impressive of the Persian intoxicants: nicotine, cultivated white poppy, and cannabis.”<sup>97</sup> He begins with the tobacco plant, and claims that “although the leaves are poisonous...in fact, its quite beneficial salt removes serum from the recesses of the head and fills the brain with exhilaration.”<sup>98</sup> Kaempfer then explains the manner in which Persians smoke, and describes how a “Khaliaan or Khaliuun” (the Persian term for a hookah) functions, and includes an image (Fig. 10) so that the reader can see how it looks. “No people indulge in smoking more than the Persians, both men and women.”<sup>99</sup>

The next “*Kheif*” that is described comes from the juice of the poppy, namely opium. For Persians “this is the famous rest, cheer, and calm of the poets, that is, the medicine that gives the mind serenity, joy and tranquillity.”<sup>100</sup> Kaempfer describes the cultivation of the poppy, the harvest of the juice, then the preparation of opium. Depending on the manner of preparation, opium can have different effects: if mixed with nutmeg, cardamom, cinnamon and mace, and reduced to a fine powder, it “is believed to offer superb benefits to the heart and brain;”<sup>101</sup> another type of opiate “is said to suffuse the mind of the taker with wondrous joys and to soothe the brain with fantastic ideas and delights.”<sup>102</sup> Our author concludes with a warning note, and mentions the dangers of addiction.

Finally, the properties of cannabis and its various manners of preparation are briefly mentioned in the final section on Persian intoxicants. He notes where the best-quality cannabis is cultivated in Persia, and the properties and effects of the different parts of the plant (e.g. “The seed has a rather weak power...some men preserve the seeds with sugar or salt for their wives to eat and also enjoy pleasure.”<sup>103</sup>) Finally, he describes how he witnessed four dervishes prepare a kind of cannabis juice

(from crushed cannabis leaves and water): “When they were filled with the liquid, as one would be with wine, and made joyous, they returned to their travels.”<sup>104</sup>

## CONCLUSION

Engelbert Kaempfer’s activities as a scientist in Persia have not yet been fully appreciated, primarily because his manuscripts on Persia are still in the process of being evaluated. Only a small group of specialists can decipher the handwriting in his journals, and thus have access to his thought. Furthermore, they have to be familiar with the state of science in Safavid Persia and early-modern Europe in order to interpret and then prepare his writings for publication. This brief study has attempted to give an overview of Kaempfer’s life and background, the factors that helped make him a scholar and student of life, whose innate curiosity pushed him to observe and record everything of “interest” that he encountered during his travels and stay in Persia, from 1683-1688. His activities and observations in the fields of botany, zoology, cartography and medicine are outlined, and certain passages from his writings were selected to illustrate his way of thinking, how he described and approached certain problems, and the conclusions he drew from his observations. Scholars have been examining Kaempfer’s many contributions, especially in the field of Japanese studies, in linguistics, in botany, and in a number of other disciplines. His accomplishments as an early-modern scientist in Persia are just beginning to be appreciated. **RC**

**Author’s note:** The quote in the title (“Seduced by the thirst for knowledge”) refers to a letter written by Engelbert Kaempfer to his friend Herbert de Jager in September 1684, in which the former gives the reasons for having traveled to Persia: “I came here with Mr. Ludwig Fabritius seduced by the thirst for knowledge, by means of which we young people are so often brought to ruin” (my translation). Karl Meier-Lemgo’s German version of the original Latin reads: “Ich bin hierher gekommen mit Herrn Ludwig Fabritius, von der Krankheit der Wißbegierde verführt, durch die wir jungen Menschen ja so oft ins Verderben gestürzt werden.” Meier-Lemgo 1965a: 14.

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## NOTES

- 1 Kaempfer 1712: *xvi*; cited and translated in Haberland 1996: 53-54.
- 2 On this topic, see Muntzschick 1993; Michel 1993; and Kaempfer 2003c.
- 3 Studies of Kaempfer's various activities are found in Hüls and Hoppe 1982; and Haberland 1993. See also Bonn 1979.
- 4 See Haberland 1996: 13; and Hoppe 2001.
- 5 See Bonn 2003: 16; Detlef Haberland notes that the University of Königsberg "was a centre of attraction for natural scientists due to its rich endowments, above all the Wallenrodt library, Panzer's pharmacy and the important botanical garden," Haberland 1996: 13.
- 6 Cf. Bonn 2003: 18; and Haberland 1996: 15.
- 7 Cf. Bonn 2003: 18.
- 8 Fabritius had already taken an "unofficial" journey to Moscow and Persia from 1679-1682.
- 9 See Bonn 2003: 21.
- 10 See Bonn 2003: 21.
- 11 Kaempfer 1999: 2 [trans. by Bodart-Bailey]. Original in British Library, Manuscript Collections, Sloane Manuscript 2923, f. 147; henceforth references to the Sloane Manuscripts will be abbreviated as "SM."
- 12 See Bonn 2003: 24.
- 13 On Kaempfer's observations regarding the Caspian, see Carrubba 1993.
- 14 Meier-Lemgo 1968: 51; my translation.
- 15 Kaempfer 1712: between 268-269.
- 16 See in this context Kaempfer 1984; Hoffmann 2003; and Gronke 2004.
- 17 The Frenchman Du Mans was born Jacques Dutertre in Le Mans. On his life and work, see Richard 1995.
- 18 See Kaempfer 2001a.
- 19 See Haberland 1996: 37-39.
- 20 See Bonn 2003: 35.
- 21 Quotation taken from Meier-Lemgo 1968: 125; translated and quoted in Haberland 1996: 48.
- 22 See Kaempfer 2003b.
- 23 Cf. Kaempfer 2003a.
- 24 For an account of his stay on Japan, see Bodart-Bailey and Massarella 1995; Kaempfer 1999; and Kaempfer 2001b.
- 25 See Haberland 1996: 67; and Bonn 2003: 54.
- 26 On Kaempfer's cartographic activities in Japan see Lazar 1982; Lazar 1993; and Sternstein 1993.
- 27 On this topic see Haberland 1996: 89.
- 28 Cf. Bonn 2003: 90.
- 29 Translated in Bowers and Carrubba 1970: 272.
- 30 Translated in Bowers and Carruba 1978: 321-322.
- 31 Kaempfer 1999: 7.
- 32 SM 2917a.
- 33 SM 2917b.
- 34 SM 2920: fol. 157-171.
- 35 SM 2910: fol. 107-111. There are also coloured illustrations of Persian plants in the British Library, Manuscript Collection, Additional Manuscripts 5232: fol. 235-236; cf. Bonn 2003: 35.
- 36 These two topics correspond to Kaempfer 1712: 505-508 and 535-552, respectively. They have also been translated into English by Robert Carrubba, in Kaempfer 1996: 1-8 and 45-64 respectively.
- 37 Kaempfer 1712: 659-764.
- 38 Kaempfer cites the account by the botanist Jean Bauhin (1541-1613) in his *Historia plantarum universalis nova et absolutissima* (Yverdon, 1650-51), 406; see Kaempfer 1996:1, and Kaempfer 1996:5, footnote 4.
- 39 Cf. Kaempfer 1996: 1.
- 40 Kaempfer 1996: 6, footnote 17.
- 41 Kaempfer 1996: 45.
- 42 Kaempfer 1996: 47.
- 43 Kaempfer 1996: 47.
- 44 Kaempfer 1996: 52.
- 45 Kaempfer 1996: 56. Carrubba notes that "hingiferous" means "hingiseh-bearing".
- 46 As Haberland notes: "In the *Amoenitates* he called it 'Phoenix persicus', with reference to its classical metaphorical sense: 'It is surely from the *Phoinix*, or *Palma dactylifera*, the noblest of all trees, sacred to Phoebus, most graceful, auspicious and long-lived, that the feathered Phoenix derives its origin and its name.'" Cf. Kaempfer 1712: 665; cited and translated in Haberland 1996: 48. See also Kaempfer 1987.
- 47 Haberland 1996: 48.
- 48 Kaempfer observes: "In my opinion a disgusting, loathsome diet. One can only assume that John the Baptist's emaciation was due to this vile lenten fare, on which he sustained himself in the desert;" cited in Haberland 1996: 52.
- 49 Cf. Kaempfer 1987:169-170.
- 50 Kaempfer 1987: 13-14; my translation. The original reads: "Die wissenschaftliche Botanik befand sich um 1700 in einer Phase des Übergangs. Die Naturforscher der Renaissance waren vor allem bestrebt gewesen, die von den klassischen Autoren beschriebenen Pflanzen zu identifizieren und wiederzuentdecken... Im Gegensatz zu dieser traditionellen Strömung überzog allerdings im späten 17. Jahrhundert schon das Bestreben, möglichst alle Pflanzenarten—also auch solche, die in der Antike noch unbekannt waren—zu sammeln, zu beschreiben und zu benennen."
- 51 *De plantis Aegypti liber: In quo non pauci, qui circa herbarum materiam irreperunt, errores, deprehenduntur, quorum causa hactenus multa medicamenta ad vsum medicine admodum expetenda, plerisque medicorum, non sine artis iactura, oculia, atque obsoleta iacuerunt... Accessit etiam liber de balsamo aliis editus Prosperi Alpini* (Venetiis, 1592). In addition, Kaempfer was familiar with the works of the French Carmelite Angelus a St. Josephus, who was in Persia from 1664 to 1673 and whose *Pharmacopoea Persica* (Paris, 1681) was important for introducing Persian medicine to Europe. See Kaempfer 1987: 15.
- 52 Cf. Kaempfer 1987: 14.
- 53 See Hoppe 2004: 147.
- 54 See Werger-Klein 1993; Bethlehem and Meijer 1993; and Gelder 2004.
- 55 Cf. Werger-Klein 1993: 42.
- 56 Kaempfer 1996: 9-17.
- 57 Kaempfer 1996: 9. Robert Carrubba observes that: "Torpedo comes from the Latin *torpere*, to be stiff, numb or torpid. The names 'numbfish' and 'crampfish' also demonstrate selection of name from the effect produced. In *De Natura Deorum*, Cicero writes: 'tutantur...torpore torpedines,' that is, 'torpedoes protect themselves with torpor'" (2.50.127); Kaempfer 1996: 15, footnote 1.
- 58 Kaempfer 1996: 9.
- 59 Kaempfer 1996: 11.
- 60 Kaempfer 1996: 12.
- 61 Kaempfer 1996: 12.
- 62 Kaempfer 1996: 13.
- 63 See Meier-Lemgo 1968: 129 ff.
- 64 Also "Bezoarziegen" and "Capra hircus." Cf. Meier-Lemgo 1968: 131.
- 65 This is my translation of the original: "daumenlang, zylindrisch, schwärzlich und völlig glatt;" Meier-Lemgo 1968: 131.
- 66 Meier-Lemgo 1968: 131.
- 67 Kaempfer 1712: 410; my translation.
- 68 Kaempfer 1712: 413; my translation.
- 69 Kaempfer 1712: 413; my translation.
- 70 I am translating from the original: "Sogar aus den Zelten, die wir in der Umgebung des kaspischen Meers aufgeschlagen hatten, stahlen sie uns Gamaschen, Schuhe und andre Ledersachen. Was ihnen zu



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- schwer gewesen war, fanden wir nicht weit von unsrer Schlafstelle wieder;" Meier-Lemgo 1968: 133.
- 71 Kaempfer 1712: 413; my translation.
- 72 Kaempfer 1712: 411; my translation.
- 73 Kaempfer 1712: 411; my translation.
- 74 Kaempfer 1712: 412; my translation.
- 75 Kaempfer 1712: 412; my translation.
- 76 Kaempfer 1712: 407.
- 77 See SM 5232.
- 78 Cf. Lazar 1982: 68-69; and Lazar 1993: 378.
- 79 Cf. Lazar 1982: 69-70; and Lazar 1993: 379.
- 80 SM 5232, fol. 108r and 109r; see also Lazar 1982: 70 and Lazar 1993: 379.
- 81 Kaempfer 1712: 764.
- 82 Cf. Lazar 1993: 379.
- 83 Lazar 1993: 379.
- 84 SM 3063, fol. 139v: correspondence between Engelbert Kaempfer – Nicolao Witsen, Amsterdam (Bandar Abbas, December 25, 1687); cited in Bonn 2003: 41.
- 85 Kaempfer 1996: 18-29.
- 86 Kaempfer 1996: 19.
- 87 Kaempfer 1996: 18.
- 88 Kaempfer 1996: 23.
- 89 Kaempfer 1996: 30-42.
- 90 Kaempfer 1996: 30.
- 91 Cf. Kaempfer 1996: 30.
- 92 Kaempfer 1996: 31.
- 93 Kaempfer 1996: 32.
- 94 Kaempfer 1996: 36-38.
- 95 Kaempfer 1996: 38-40.
- 96 Kaempfer 1996: 180-198.
- 97 Kaempfer 1996: 181. For an analysis of the use of intoxicants in Safavid Persia see Matthee 2005.
- 98 Kaempfer 1996: 184.
- 99 Kaempfer 1996: 185.
- 100 Kaempfer 1996: 185.
- 101 Kaempfer 1996: 186.
- 102 Kaempfer 1996: 187.
- 103 Kaempfer 1996: 188.
- 104 Kaempfer 1996: 189.

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