



Between *Grassroots*-Scholarship and Commerce: The Trade in Natural History Specimens by the Moravian South Asia Mission¹

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The *scholar* must collect, observe, check, examine, describe, determine, explain, create order. The *non-scholarly* person must search, report to and deliver into the hands of the scholar² (Schaeffer 1764: 19, emphasis in original).

Introduction

At the end of 1778, the Halle publisher Johann Jacob Gebauer (1745-1818) (cf. Kertscher 2001), with an interest in natural history, received a letter from the Danish colony Tranquebar. In this letter Wilhelm David Becker (1746-1818), factor of the Danish-English-Halle mission (DEHM) there³, wrote that in Europe one could hardly imagine the 'trouble and costs' involved in preparing and conserving 'insects' in South India⁴ (Becker 31 January 1778). Collecting natural history specimens in general could only be done adequately if it were made a 'proper profession':

A person who sets out to do this can earn a considerable amount of money if he becomes known like one of the Moravians who has done so much that other collectors of natural history specimens and insects here don't exert themselves but instead buy it from him and still make a profit. The revenue from this is one of the largest sources of income for the Moravians⁵. (ibid.)

Becker describes a central aspect of natural history in the eighteenth



century: making nature available on a global scale, the resourcing and relaying of natural history specimens (Charmantier & Müller-Wille 2012: 4-15; Chakrabarti 2010: 49-82; Dietz 2009: 235-57; Dauser 2008; Dietz 2006: 363-82; Nair 2005: 279-302; Schiebinger & Swan 2004; te Heesen & Spary 2001). At the same time the letter also reveals a phenomenon that is rarely taken into account in the history of science and of knowledge: the commercial trade in natural history specimens. It also, however, talks about the challenges associated with this.

The central question was to whom and how to give the knowledge as well as practical skills needed to transform living animals into natural history specimens, conserve them properly and mobilise them for the long voyage by sea. Only then could they become the objects of knowledge and prestige much sought after in Europe.⁶ Additionally, the quote illustrates the importance of the missionaries and the mission workers, mostly rendered anonymous in the process (Müller-Wille 2003: 154-72; Dietz 2009: 239, 251). This article focusses on these seldomly noticed actors and questions modes of integration and acknowledgement, otherwise taken for granted in the large network of natural history.⁷ With reference to the phenomenon of '*grassroots*-scholarship in natural history'⁸, as described by Bettina Dietz (Dietz 2009: 235), the prerequisites and motivations for the participation in this natural history project of the members of the South Asia mission of the Moravian Church⁹, referred to by Becker, will be regarded with special interest. Using their example, this article will examine the scope and the acceptance of commercialisation of natural history. What this article cannot achieve is to examine the contribution of indigenous helpers to the exchange of objects and knowledge.¹⁰ Instead, the overall scope, practices of commercialisation of natural history, and the specific contribution of the hitherto scarcely known Moravian South Asia mission of the Moravian Church will form the focus of the study.¹¹

Trade in Natural History Specimens and the Natural History Network

From 1732 onwards, aside from the missionaries of the DEHM the members of the Moravian Church (short Moravians), founded in 1727, were the only representatives of organised Protestant missionary work in the eighteenth century (cf. Mettele 2009; Beck 1981). From 1760 till 1803 the South Indian town Tharangambadi (formerly Tranquebar) was the central location of their South Asia mission (cf. Ruhland 2013; Krieger 1998; Römer 1921). Almost all Moravian missionaries were craftsmen who not only had to support themselves through their own work, but also had to finance the development of their settlement, called the



'Brethren's Garden'¹². Moreover, till the end of the 1790s the principle of a collective economy was maintained in their settlement in South India according to which all local members shared expenses (cf. Engel 2009: 32-6, 146-71).

The account books of the Brethren's Garden, only some of which are still available, first mention income through the sale of natural history specimens in 1774, which would exceed more than astonishing 10,000 Reichstaler (Rt.) (cf. UA. MDpn XI.10; UA. MDpn XI.16)¹³ in the following 23 years. In some years, the local sale of natural history specimens brought in the largest income of the entire settlement with about 1,500 Rt.—this illustrates the unexpectedly high demand for Indian natural history specimens in India itself (cf. *ibid.*). Other accounts of the European headquarters of the Moravians for the same period list additional earnings of over 2,200 Rt. from 19 shipments of natural history specimens to Europe. On an average, the at least nine people who were successively involved in collecting specimens generated an annual income of about 530 Rt. This was significantly more than the salary of the DEHM doctor, Johann David Martini (d. 1791), who received less than 300 Rt. annually (Becker 20 February 1778).

The records for direct shipments of natural history specimens to Europe list only three categories: seashells¹⁴, i.e. snails and mussels, botanical objects and 'natural history specimens' in general. With twelve documented shipments, seashells ranked first, above eight deliveries of plant specimens and five deliveries of unspecified specimens. And yet, an announcement of sale in 1778 by Martin Brodersen (1718-1803) illustrates the wide range of natural history specimens on offer by the Moravians in Tranquebar itself and thereby their specialised knowledge of different genera and species:

- 1) Well-made insect boxes containing a nice assortment of butterflies, beetles, flies etc. Each box costs 15 star pagodas here in Tranquebar.
- 2) Assortments of seashells, like snails and mussels and other plants of the sea.
- 3) All kinds of herbs and grasses placed with their buds between sheets of paper.
- 4) All kinds of animalia in spirit.

In addition, from time to time, collections of sponges, crabs etc. (Brodersen 1778)¹⁵

According to this list, the Moravians were capable of providing specimens from all spheres of the animal and plant kingdom. And yet, the question as to what happened to the enormous number of objects from



the collection of natural history specimens and what level of knowledge was available to the Moravians remains unanswered. Local buyers were Europeans living in India: natural historians, merchants and officers (cf. Becker 31 January 1778). The first group included employees of the DEHM like the famous mission doctor Johann Gerhard König (1728-1785)¹⁶, the missionary Christoph Samuel John (1747-1813), and the botanist in the service of the English East India Company, William Roxburgh (1751-1815) (cf. Hommel 2010; Hommel 2006; Robinson 2008). However, it is difficult to further reconstruct the fate of the specimens sold in Tranquebar. Only two of the boxes of insects sent by Becker and the missionary Johann Friedrich König (1741-1795) to Gebauer in Halle were clearly obtained from the Moravians and were purchased locally in Tranquebar (cf. John & Rottler 25 October 1792).

The direct shipments to Europe mentioned earlier throw a much clearer light on the whereabouts of the natural history specimens. The records clarify the local and individual cornerstones of integration of Moravian shipments of natural history specimens into the transnational network of the mission, which was partially congruent with the natural history network. Nine shipments were sent to London, six to Copenhagen, and four went to Germany. Acknowledged natural historians appearing by name are Sir Joseph Banks (1743-1820), president of the Royal Society in London, Johann Christian Daniel Edler von Schreber (1739-1810), president of the German Academy of Naturalists, Leopoldina, Lorenz Spengler (1720-1807), director of the Royal Danish Art and Natural History Cabinet and Johann Hieronymus Chemnitz (1730-1800). At the same time, a special kind of integration into the network becomes evident: The collectors in Tranquebar seldom communicated directly with the buyers of their specimens. The transport, even the payment, was carried out via intermediaries, who received the goods in Europe and passed them on or organised their sale independently. In London it were renowned members of the Moravian Society, Johann Gotthold Wollin (1725-92) and Philipp Hurlock (1713-1801), who took on this position of intermediaries.

In individual cases, the further life of the specimens, including their use in natural history publications, can be traced through the recipients of the shipments. Spengler and Chemnitz were mainly recipients of rare seashells to which the Moravians had exclusive access through their settlements in Tranquebar and on the Nicobar Islands. Through descriptions and illustrations in Chemnitz' *Neues systematisches Conchylien-Cabinet* they became an integral part of knowledge about natural history (Chemnitz & Martini 1768-1795).

The example of the *Conchylien-Cabinet* and the aforementioned sales of



specimens mentioned suggest that many European collectors received natural history specimens from the Moravian South Asia mission. The earlier mentioned Spengler states that the "exotic" nature and the high quality of the specimens send by the Moravian South Asian mission were the reason for their popularity in Europe:

Through diligent searching the Evangelical Brothers [the Moravians; T.R.] [...] have succeeded in discovering the genuine wentle-traps [*Epitonium scalare* (Linnaeus, 1758)] here for the fatherland, so that now even private collections can shine with this rare piece that could earlier be seen only in the cabinets of great men because of the high price that the Dutch commanded for it. (Spengler 1775: 388-9)¹⁷

Grassroots-Scholarship as a Natural History Practice

Given this context, one must ask how the Moravian craftsmen-missionaries developed an interest in natural history and gained their knowledge of it.¹⁸ Both aspects form the foundation for the profitable trade in natural history specimens they established. The answer probably lies in the particular features of the Moravian Church: the higher than average literacy of the community as well as the high educational background of its leading figures. Even when a shoemaker like Brodersen mentioned botanical specimens in his sales catalogue, one should not forget the significance of botany as a scholarly pastime and its strong connection to medicine in the eighteenth century.¹⁹ Thus, a shipment of plant specimens from Bengal in 1796 by Johannes Grasmann (1742-1822) to Schreber is proof of the participation of studied participants in the Moravian collection of natural history specimens.²⁰ Like several other leaders of the Brethren's Garden, Grasmann was educated at the academy of the Moravian Church in Barby, Germany, near Magdeburg, where botany, medicine and natural history were a permanent part of the curriculum (cf. Becker 2005: 17-51; Uttendörfer 1916: 89-106). Friedrich Adam Scholler (1718-85), professor at Barby, wrote the first book on the botany of the region, according to the system devised by the then leading Swedish naturalist Carl von Linnæus (1707-78). Several other teachers there were closely associated with the University of Göttingen (cf. Scholler 1775; Augustin 1996: 159-80).

Barby, however, was also a central point of reference for the Moravians doing skilled manual work. Many of them stayed with the leaders of their Church in Barby while waiting to be sent out to a mission station. They were therefore familiar with the large art and natural history cabinet there (Augustin 2005: 1-16). Its director, Johann Jacob Bossart (1721-89), wrote a *Short Guide, on how to Collect Natural History Specimens*²¹ in 1774. In this he instructed the non-academic missionaries in



the best ways to prepare specimens to make them last permanently and transportable (Bossart 1774). He described the practices of specimen collection in detail with the aim of maintaining the natural objects in their materiality and transporting them to Europe, in the best possible condition. Although all objects in Barby were classified and listed according to the Linnaean system, Bossart does not mention this system of classification to the specimen collectors he addresses. Despite this, his guide followed the latest developments in natural history and guaranteed the scientific usability and interpretability of the prepared specimens even in the Linnaean system. For example, he told the collectors to count the stamens necessary for the botanical classification, or to at least handle them carefully and to describe all the circumstances of the find precisely (cf. *ibid.*: 21).

The success of this form of popularisation of natural history knowledge is evident in the sheer volume of trade in natural history specimens and it becomes also tangible in the specific genre of the Moravian Memoirs. Brodersen, for example, states in his autobiography that his motive for this engagement in natural history was to 'make my friends and benefactors in Europe [...] happy by collecting some seashells as a sign of gratitude to them'. He also writes that he was able to 'sell [...] some of the seashells and thus help our finances'²² (Memoir of Brodersen). The mention of benefactors here is more than a phrase. It points to the politically explosive nature of the Moravian South Asia mission which fought against proscriptions issued by the Danish king and their missionary rivals' in form of the DEHM for almost a decade during which it was constantly threatened with closure (cf. Ruhland 2013, 2018). Brodersen's example illustrates how the Moravians used the passion for collecting and the interest in natural history of important decision makers at the Danish court for their own interests.

Christian Gottlieb Kratzenstein (1723-95), professor of physics in Copenhagen, created an overview of the most important Danish natural history cabinets in Regenfuss' famous book on seashells of 1758. Seven of the most important Danish collectors of natural history specimens he mentions were later involved in the conflict around the existence of the Moravian South Asia mission. Among them are the Danish king, the president of the Mission Board, Johann Ludwig von Holstein (1694-1763), as well as his successor Otto von Thott (1703-85), and Adam Gottlob von Moltke (1710-92), the president of the monopolised Danish Asiatic Trading Company (cf. Regenfuss 1758: IIX-XIV). At least five of them purchased natural history specimens from the Moravian South Asia mission or received them as gifts. By way of gifting prestigious natural history specimens to influential patrons as well as the continuous activity of collecting, which ensured a constant supply of new objects, the



Moravians in Tranquebar made themselves indispensable as a supplier of this goods. Mainly, however, the Moravians hoped in this way to safeguard the existence of their mission through political protection. In practise, this effort tied in with the commercial necessities of the community as well as with the natural history interests of individual participants. It thus led to the establishment of the Moravian natural history specimen collection and the extensive commercial trade in these specimens.

A successful trade in natural history specimens required a varied and comprehensive supply. For this, the sellers had to at least be able to classify the available specimens as different species and, ideally, assign the names according to the Linnaean taxonomy. Christoph Conrad Barlach (1759-1832) furnished evidence for this classificatory ability in his autobiography. The specimens he offered for sale included 'beautiful collections of some 90 kinds of crabs, the longest a yard long; birds ranging from the large secretary bird to the hummingbird, also different snakes, stuffed and in spirit'²³ (Memoir of Barlach). Johann Gottfried Hänsel's (1749-1814) report clearly illustrates how closely the ability to distinguish between different species in natural history was linked to the practical handling of natural history specimens:

[...] and though I possessed no previous knowledge of these things, and would not venture to determine a proper classification of the various natural productions which I collected, [...] yet constant practice and experience gave me by degrees sufficient skill to distinguish what was really worthy the attention of naturalists.
(Hänsel 1812: 35-6)

The aim of the members of the Moravian South Asia mission was not to publish their findings. Their main concern was to increase their own knowledge of natural history since it was the basis of their trade in specimens. Knowledge was acquired chiefly through the work of collecting, but there were also other impulses such as the natural history cabinet in Barby and theoretical instruction like the earlier mentioned guide by Bossart.²⁴ The Moravian collectors are thus a part of the 'phenomenon of a *grassroots*-scholarship in natural history'²⁵ (Dietz 2009: 235). Dietz characterises this as 'concrete practises of knowledge production' such as the practical activity of accumulating objects of nature and knowledge of these objects without ever being named in natural history publications, let alone being known personally through 'scholarly authorship'²⁶ (Ibid.). We see here a form of practicing natural history that was fundamental to the establishment of natural history as a science in the eighteenth century and thus for the establishment of modern science. And yet it has hitherto not received a lot of attention in historiography: the collecting of natural history specimens, their handcrafted transformation



into objects of knowledge as well as their despatch to the centre[s] of calculation.²⁷ Owing to the systematic mastery of these practises of natural history the Moravian missionaries became an integral part of the natural history network.

Within this network, natural history specimens and books were mostly exchanged among scholars. They circulated as reciprocal gifts in accordance with the gift-exchange theory of Marcel Mauss (cf. Müller-Wille 2008; *ibid.* 2003). As part of this gift-economy the discovery of new species was considered especially important. This was shown by explicitly mentioning the discoverer while describing the species or even naming the species after him (cf. Mariss 2015: 207-227). The Moravian commercial trade in natural history specimens led to a fundamentally different practise. The Moravians negotiated the conditions for their exchange of goods in a free market. Keeping with their collective economy, they presented themselves as a community and not as individuals, when doing so. They therefore used the Latin name for the Moravian Church, *Societas Unitas Fratrum*, or a corresponding abbreviation, to mark their specimens, if they did so at all.²⁸ This did not affect the integration of the natural history specimens provided by them into the knowledge of their time. They became much sought-after elements of many different collections and thus also the basis of descriptions of specimens in various natural history publications (cf. Hoppe 2010: 164-5, who traces this process for the missionaries of the DEHM).

However, since the authors of these publications had purchased the described objects on a free market and since they did not identify with the Moravians and did not acknowledge them as their equals in scholarship, there was no reason for them to honour and name the discoverers and suppliers of a new species.²⁹ Thus, in the *Conchylien-Cabinet*, as in many other cases, names of individual Moravians were an exception and even their religious community was only seldom mentioned.³⁰ Because of the collective economy of the Moravians and their commercial, anonymous mode of trade in natural history specimens the individuals retreated completely behind the objects. Thus, no names of collectors were linked with the specimens and the associated publications, and there was therefore no 'intellectual ownership' (Müller-Wille 2003: 159).

Aside from the seashells, this aspect becomes particularly evident with the botanical specimens which attest to the extent of natural history knowledge of the Moravians and to the high level of their conservation skills. In August 1775 Banks' assistant, Daniel Solander (1733-82), wrote about a shipment which Banks apparently ordered explicitly after visiting the Moravian settlement Zeist in the Netherlands in 1774 (cf.



Maiden 1909: 52):

Mr. Hurlock has send to your house the plants [...]; they are collected near Tranquebar by Breteren [sic!] of the Moravians, and as good specimens as any I have seen. If things come in, in this manner, you will soon want another dozen of cubes. Mr. Koenigs³¹ plants [...] I thought [...] made a fine figure, but these surpass them by 100 per cent. [...] They seem to be about 3 or 400 (Solander 22 August 1775, cit in Duyker & Tingbrand 1995: 356).

The superior quality of this supply led to a repeated trade on demand of natural history specimens. This high standard did not refer only to the state of preservation of the specimens, but also to the way they had been conserved and scientifically named. Moravian herbarium sheets of 1786 identify the specimens with their Latin names according to the Linnaean model and carry the local Tamil name in a Latin transcript.³² Regardless of these scientific characteristics of the specimens the loss of intellectual ownership for the Moravian Church (but also for the indigenous collectors) through commercial trade in natural history specimens continues even today. There are labels with abbreviations like 'Soc. Unit. Frat.' on the partly preserved original sheets of paper on which Moravian specimens are mounted, which could be used to clearly indicate the collectors.³³ Despite that, even inventories and databases in contemporary collections and museums rarely attribute these specimens them to the Moravians as a group of collectors.³⁴

Hurlock in London provided Banks with hundreds of Moravian specimens. For this intermediary position in the natural history network Hurlock not only became a member of the Royal Society through the intervention of Banks and Solander, but he is also often named in the catalogues as the collector of these natural history specimens.³⁵ Furthermore, some of these Moravian specimens that are preserved till today in the Natural History Museum in London are listed as the type-material for the all-important biological nomenclature and were used by Linnaeus' son and other scientists for the first scientific description of certain species.³⁶ Considering this, the ignorance about the Moravians as a group of collectors is astonishing. The connection between the anonymity of commercial trade in natural history specimens and the focus in the history of biology on individual 'first-describers' (Hoppe 2010: 142) is the main reason why the natural history contributions of the Moravian and their South Asia mission in particular have hitherto been scarcely acknowledged in the history of science and of knowledge.³⁷ Through a misinterpretation of 'Societas Unitas Fratrum' the few available proofs in turn were ascribed to a never-existent 'society of bota-



nists' in Tranquebar with the name 'United Fratrum', or, as with Desmond and Jensen 'United Brethren'. They were thus not linked with the work of the Moravian Church in South Asia (Desmond 1992: 39; Jensen 2015: 539-40; Kochhar 2013: 203; Noltie 2005: 109; Sen 1991: 74; Stansfield 1957: 42. An exception that has barely been noticed is Burkill 1965: 45).

Taxonomy and Commerce

Commerce was an integral part of natural history not only with regard to the procurement of material, but commercial elements were also constitutive with respect to methodology and epistemology. The Moravians worked on both levels. While the natural history collection has already been described in detail, the work on the foundations of natural history can only be touched upon briefly with reference to the previously mentioned teachers at the Moravian Academy in Barby, Bossart and Scholler. Since, however, the conjunction of natural history taxonomy and commerce was the basis for the high demand for specimens and thus for the economic success of the Moravian specimen collection, it will be highlighted hereinafter.

Globalisation in the eighteenth century brought a multitude of new objects of nature to Europe which virtually led to a so called 'information overload' (cf. Charmantier & Müller-Wille 2012) of traditional systems of knowledge. At the same time, the rapid development of natural history constantly required new objects which, when identified and described, led to a multitude of new taxonomic systems (cf. Spix 1811). Linnaeus developed an '*economy of botany*'¹³⁸ with specific operations of circulation and comparison in order to deal methodically with this mass of objects (Müller-Wille 1999: 312, emphasis in the original). This led to his concept of a *natural system* of species into which new species could be easily integrated. Consequently, 'as a result of an interminable process of research'¹³⁹ (ibid.), continual revision and expansion was implied in the system (cf. Dietz 2017). With his innovation Linnaeus established not only epistemological, but also commercial relations between the objects of nature, his constantly updated taxonomy and the natural history collections as the repositories of these objects. In these correlations knowledge about nature transformed itself into market value, linked to the movement of the objects or rather gratified by it (cf. Te Heesen & Spary 2001: 12). This transformation process arises from the fact that in the moment of their publication natural history taxonomies generated a material value. In their constant updating they marked individual species as novelties which were missing in most of the natural history collections. Thus, a demand was created for these specimens. Linnaeus'



*Systema Naturæ*⁴⁰ has to be seen as the starting point of this development since the number of species described increased many times over till the twelfth edition (cf. Dietz 2012).

The possession of a natural history collection enhanced the prestige of the collector in the scholarly world, but it was chiefly necessary in order to be able to comment comprehensively as a natural history authority on a specific animal or plant genera. Especially in the second half of the eighteenth century, 'the age of cabinets'⁴¹ (Schröter 1776: 48) that witnessed increasing specialisation in the field of collections, the precondition for taking part as scholar in a certain field of natural history was that one's own cabinet was as complete as possible and that newly described species were constantly acquired. At the same time, the standardisation of systematisation, cataloguing and arrangement of different natural history collections according to the Linnaean system that was becoming more and more popular all over Europe, made detailed comparisons among collections possible⁴², but also revealed the gaps in a collection (cf. Siemer 2004: 240-47). The comparison of collections became easier with the gradually more consistent consecutive numbering of species and genera, introduced for the first time in the Halle edition of the *Systema Naturæ* in 1740 (cf. Linné 1740a).⁴³

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This numerical system also facilitated comparisons of 'live representatives of plant species with the numbered names in the catalogues'⁴⁴ (Müller-Wille 1999: 167), while on excursions for example. But it also established a systematic order that was easy to use for the spatial arrangement of natural objects in natural history cabinets and thus also made it easier to collate the findings in the field with dead representatives of that particular species in a collection (ibid.: 164). Through the structure of the inventories and the corresponding practice of presentation according to the Linnaean system of numbering, missing species or genera could also be easily identified as a gap. Efforts to fill this gap led to the 'circulation of objects that was indispensable for the process of knowledge-creation in natural history'⁴⁵, as described by Dietz (Dietz 2009: 247). This process of circulation was embedded in worldwide trade relations, and the Moravian shipments of natural history specimens were an integral part of this.

Conclusion

The commercialisation of nature did not exclusively take place through the exploitation of European colonies and their natural resources. Natural history was already commercialised through the process of specimen-collection. The high demand for specimens could only be met through specimen-trade which became a 'proper profession'⁴⁶. The



Moravians institutionalised this natural history practice in the framework of their South Asia mission. The updates in the Linnaean system resulted in a constant need of European armchair-scholars for new objects of nature. This, as well as the passion of politically influential collectors, was used by the Moravians and their South Asia mission to their advantage to finance their missionary work and to secure its legal standing. Through the comprehensive mastery of different methods to conserve natural history specimens and their safe transfer to Europe, the Moravians made a significant contribution towards the scientific completion of European cabinets. As *grassroots*-scholars the missionaries themselves generated extensive knowledge of natural history which enabled them to transform natural objects into objects of knowledge. These, however, were never published by themselves. They were indispensable suppliers of material and therefore an integral part of the natural history network. And yet the example of the Moravian commercial trade in natural history specimens also reveals that this network created distinctions between the participants and, contrary to its ideal, reproduced social hierarchies. *Grassroots*-scholarship was an integral component of natural history, but the scholars of the time did not consider its exponents to be their peers. Therefore, the names of the commercial collectors of natural history specimens are only seldom mentioned in works of natural history and in natural history collections, even today. As a result, the contribution of the Moravian South Asia mission to natural history has hitherto been seldom acknowledged in the field of the history of science and knowledge and their specimens that are still available are, if at all, attributed to a never-existent society of botanists in Tranquebar.

Endnotes

¹ First published in German (and here only slightly updated in the bibliographical references) in Förchler & Mariss 2017: 29-45. The author is indebted to Rekha Vaidya Rajan and Maria Schnoor for the English translation.

² 'Der *Gelehrte* muß sammeln, beobachten, nachsehen, prüfen, beschreiben, bestimmen, auseinander setzen, in Ordnung bringen. Der *Ungelehrte* muß aufsuchen, dem Gelehrten zutragen, und in die Hände liefern'.

³ On the use of the term and for the history of the DEHM see Fihl & Venkatachalapathy 2014; Liebau 2008: 2; Gross 2006a; Gross 2006b: xxi–xxxii, here xxvif.

⁴ 'Mühe[n] und Kosten'/'Insecten'.

⁵ 'Wer sich auf dergleichen hier leget, kan was beträchtliches dabey verdienen, wenn er in bekantschaft komt, wie einer der Herrnhuter es denn so weit gebracht, daß auch andre Naturalien= und Insecten Samler, alhier sich nicht darum bemühen, sondern sie von denselben nehmen und dennoch ihren Profit dabey haben, und ist die Einnahme hiervon bey den Herrnhutern eines ihrer größten Einkünfte'.

⁶ See Mariss 2015: 227-48; Dietz 2008; Strasser 2012.

⁷ On the importance of the Protestant mission for the history of science see Trepp 2010 and see



the articles in Liebau 2010; Mann 2008; Mann 2006. On the re-evaluation of the history of nature and the modes of participation in this network see Spary 2008.

⁸ 'naturhistorischen *grassroots*-Gelehrsamkeit'.

⁹ For the use of the term and for the rivalry between the DEHM and the Moravian South Asia mission see Ruhland 2013: 86-9, Ruhland 2018.

¹⁰ For the local co-workers of the DEHM see Liebau 2018.

¹¹ In a first overview Birgitt Hoppe has only looked at the DEHM and does not mention the Moravians (Hoppe 2010).

¹² 'Brüdergarten'. Today locally known as 'Salomon's Garden'.

¹³ From 1781 onwards a separate section 'Collection of natural history specimens' is expressly mentioned (cf. UA. MDpn XI.16).

¹⁴ The German term used is 'Conchylien'.

¹⁵ Becker quotes the value of a star pagoda in 1778 with 2 Rt 14 Groschen Prussian (Brodersen 1778). Even in 1792 the price for a box of insects is the same as in 1778. A box with conch shells cost 30 or 60 star pagodas depending on the size, and a bottle with specimens of two fish or snakes in spirit cost 2 star pagodas (John & Rottler 25 October 1792).

1) wohl eingerichtete Insecten=Kästgen, enthaltend schöne assortiments von Papillons, Käfer, Fliegen u. s. w. eines kostet hier in Tranquebar 15 Stern Pagoden.

2) Sortimenten von Conchylien, als Schnecken und Muscheln u. anderen SeeGewächsen.

3) Allerhand Sorten Kräuter und Gräser mit ihren Blüten zwischen Papier gelegt.

4) Allerley Animalia auf Spiritus. Ferners zu weilen Sammlungen von Schwämmen, Krabben p.p.

¹⁶ For Johann Gerhard König see Sterll 2008: 111-29; Jensen 2018; Ruhland 2021. The fact that König did not collect all his botanical specimens himself but also purchased them from others can also be seen from his letter to Solander of 24 January 1774 (cf. Rendle 1933: 148).

¹⁷ Spengler also described this species in Chemnitz' *Conchylien-Cabinet* and named the Moravians as the suppliers. Specimens from his collection – his first specimen bought in Holland in 1762 cost him 545 Gulden – served as models for the illustrations (cf. Chemnitz 1780: 263–74, Tab. CLII f., Fig. 1426-1433). 'Durch fleißiges Nachsuchen der Evangelischen Brüder [der Herrnhuter; T.R.] [...], ist es ihnen gelungen, das Vaterland der ächten Wendeltreppen daselbst entdeckt zu haben, so daß nunmehr auch Privatsammlungen mit diesem seltenen Stück prangen können, welches um seines hohen Preises willen, worinn es die Holländer so lange Zeit zu halten gewußt, vorher nur in großer Herren Kabinetten anzutreffen gewesen'.

¹⁸ Hermann Wellenreuther coined the terms 'Halle Theologian-Mission' and 'Moravian Craftsman-Mission' as a principal distinction of this two protestant mission in the 18th century (Wellenreuther 2003: 170).

¹⁹ Overall, nine physicians and surgeons worked in the Moravian South Asia mission. In 1782 the corpse of a Moravian was autopsied to determine the cause of his death. Moreover, the medicinal use of Indian plants was well known. One can assume that such people were closely linked with the collection of natural history specimens, but proof exists only in the case of Benjamin Heyne (1770-1819), who is rarely perceived as a Moravian in relevant research (cf. Römer 1921: 65, 74-7; Hoppe 2010: 160-5).

²⁰ Seven of the nine people who took part in the work of collection were, however, craftsmen (cf. Römer 1921: 74-7).

²¹ 'Kurze Anweisung Naturalien zu samlen'.

²² 'meinen Freunden und Wohlthätern in Europa durch Sammlung ein[ig]er Conchilien aus Erkenntlichkeit gegen sie, eine Freude [...] machen'/'von den Conchilien manches [...] verkaufen, und damit unserer Haushaltung dienen'.



²³ 'schöne Sammlungen von einigen 90 Sorten Krebse, die größten von einer Elle Länge; und Vögel vom grossen Sekretair bis zum Kolibri, auch verschiedene Schlangen ausgestopft und in Spiritus'.

²⁴ Jacob Christian Schaeffer (1718–1790), a German protestant pastor and also a famous natural historian mentions how he used the 'help' of the 'non-scholarly' [*Ungelehrte*], who he had to 'drill' [abrichten] before, in his studies on natural history. Besides the value that he ascribed to the practical knowledge of 'bird catchers' and 'fishermen', for example, he also emphasises the importance of 'pictures or [objects; T.R.] in his collections', in order 'to produce a sensory understanding of every object' in its potential collectors (Schaeffer 1764: 19-21, emphasis in the original).

²⁵ 'Phänomen einer naturhistorischen *grassroots*-Gelehrsamkeit'.

²⁶ 'konkrete[] Praktiken der Wissenserzeugung'/'gelehrte Autorschaft'.

²⁷ For a comprehensive critique of the centre-periphery-distinction see Nair 2005.

²⁸ This applies to all the Moravian specimens in the holdings of the *Linnaean Collection* of the Linnaean Society of London which are dated 1785 and 1786, as also to the hitherto 25 specimens identified by the author in the holdings of the Natural History Museum, London which are dated 1775, 1778, 1784 and 1785.

²⁹ On the practice of establishing a comprehensive network of suppliers and its social and scientific acknowledgement as well as on the payment for specimens in general see Schaeffer 1764: 21-2.

³⁰ Even in those rare cases, where the Moravians are identified as the suppliers of specimens, the many versions of the name of their religious community make it difficult for readers today, to connect them with the Moravian Church. Chemnitz mentions them, for example, as: 'Colonie mährischer Brüder' [Colony of Moravian Brethren], 'Colonie der evangelischen Brüdergemeinde' [Colony of the Evangelical Brethren Community], 'Mährische[] Brüdergemeinde' [Moravian Brethren Community], and 'Mährische[] evangelische[] Brüder' [Moravian evangelical Brethren] (Chemnitz 1781: 48; *ibid.* 1782: 51; *ibid.* 1780: 213, 271).

³¹ This refers to Johann Gerhard König, the mission doctor of the DEHM.

³² See for example: Linnaean Society of London. Smith Collections, <https://www.linnean.org/research-collections/smith-collections> [last accessed 06.10.22]: LINN-HS 1059.1 *Torenia hirsuta* (Herb Smith), LINN-HS 1542.21 *Smilax indet.* (Herb Smith), LINN-HS 721.6 *Bauhinia purpurea* (Herb Smith), LINN-HS 881.1 *Psidium pomiferum* (Herb Smith), LINN-HS 882.24 *Myrtus cumini* (Herb Smith), LINN-HS 752.3 *Murraya exotica* (Herb Smith); Linnaean Society of London. Linnaean Collections, <https://www.linnean.org/research-collections/linnaean-collections> [last accessed 06.10.22]: LINN 932.18 *Trigonella sp.* (Herb Linn); and with a uniform label in the holdings of the Natural History Museum London, data.nhm.ac.uk [last accessed 20.07.22]: *Scilla hyacinthina* (Roth ex) J. F. Macbr. BM000958268.

³³ On the significance of the *Parerga*, in this case the sheets of paper, which form the base for mounting the specimen thereby constitute the herbarium sheet as a scientific object and also the significance of *Paratexts* for the history of objects see Grave 2007: 46-7 and Ruhland 2018b.

³⁴ See note 28.

³⁵ See Mason 2001: 53. Linnaean Society of London. Smith Collections, <https://www.linnean.org/research-collections/smith-collections> [last accessed 06.10.22]: LINN-HS 1397.32 *Cymbidium indet.* (Herb Smith), LINN-HS 1403.15 *Limodorum indet.* (Herb Smith), LINN-HS 721.6 *Bauhinia purpurea* (Herb Smith), LINN-HS 352.1 *Mussaenda frondosa* (Herb Smith), LINN-HS 352.13 *Mussaenda indet.* (Herb Smith), LINN-HS 1420.1.2 *Pistia stratiotes* (Herb Smith); and see note 28.

³⁶ See for example: Natural History Museum London. 2014. Dataset: Collection specimens. Resource: Specimens, <http://dx.doi.org/10.5519/0002965> [last accessed on 06.10.2022]: *Scilla hyacinthina* (Roth ex) J.F.Macbr. BM000958268, *Hybanthus leptorhizum* DC. BM000617693, *Hibiscus rigidus* L.f. BM000645465, *Justicia tranquebariensis* L.f. BM000950151, *Phaseolus trilobus* Aiton BM000958615, *Cenchrus biflorus* Roxb. BM000959665, *Neonauclea excelsa* subsp. *excelsa* (Blume) Merrill BM000797235, *Justicia tranquebariensis* for example was first published by the son of Linné. Linné 1781: 85.



³⁷ Contributions of the Moravians to the natural history of Greenland, for example, are well-known (cf. Cranz 1765).

³⁸ 'Ökonomie der Botanik'.

³⁹ 'Als Resultat eines unabschließbaren Forschungsprozesses'.

⁴⁰ See Linné 1735; *ibid.* 1740a; *ibid.* 1740b; *ibid.* 1748, *ibid.* 1758-59, *ibid.* 1766-68.

⁴¹ 'Kabinetseculum'.

⁴² See Linné 1740a: preface § 10; Strasser 2012: 319–323.

⁴³ The consistent numbering of the species of the animal kingdom was introduced by Linné himself only in 1748 in the sixth edition of the *Systema Naturæ* whereas this invention in the Halle edition of 1740 was introduced by the editors Johann Joachim Lange (1699-1765) and Gottfried August Gründler (1710-1775). Linnaeus had numbered the plant species first in the *Species Plantarum* in 1753, in which he had also introduced the binary nomenclature. He adopted the numbering of plant species in 1759 in the tenth edition of *Systema Naturæ*, whereby new additions were still marked by alphabetic characters. In the twelfth edition genera and species were renumbered in the field of botany (cf. Linné 1740a; *ibid.* 1748; *ibid.* 1759; *ibid.* 1767).

⁴⁴ 'lebender Repräsentanten von Pflanzenarten mit den durchnummerierten Namen in den Katalogen'.

⁴⁵ 'für den Wissensbildungsprozess der Naturgeschichte [...] unverzichtbare Zirkulieren von Objekten'.

⁴⁶ 'ordentlichen Profession'.

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