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Abstract

This paper discusses the significance of East India trade to scientific travel in the eighteenth century, focusing in particular on the so-called “apostles” or travelling students of Linnaeus. On the one hand, enterprises such as the Swedish East India Company (SOIC) were of crucial importance by providing both incentives for natural history research and the necessary infrastructure for scientific travel. It is indeed difficult to imagine most of the apostles’ expeditions without the framework of East India trade. On the other hand there were also obvious limits to the willingness of the SOIC to actively sponsor research which was not immediately useful or profitable; such support was typically only given to travellers working on board as chaplains or surgeons, and only as long as it did not interfere with their regular duties. In this context, I briefly discuss the complicated relationship – in the eighteenth century no less than today – between two contrasting scientific ideals: one based on the notion of curiosity or the search for knowledge as an end in itself, and the other fuelled by a belief that science is meaningless if it does not yield tangible benefits to human economy and society.

Linnaeus' apostles, scientific travel and the East India trade

Kenneth Nyberg

Introduction

The main purpose of this paper is to discuss the significance of East India trade to eighteenth century scientific travel in general and to the "apostles" or travelling students of Linnaeus in particular. First I will attempt to briefly summarize some key aspects of scientific travel in the eighteenth century more generally, thus placing Linnaeus' apostles in their historical context. I will then proceed to the apostles themselves and a discussion of the significance to their travels of the East India trade on several levels, focusing especially on the role played by the Swedish East India Company (usually abbreviated SOIC after its Swedish name, "Svenska Ost-Indiska Compagniet"). Finally, I will try to make a balanced assessment of the nature and importance of that role, as there is sometimes (in my view) a tendency to paint an idealized picture of the relationship between the SOIC, Linnaeus and his travelling students.

At the outset, it should be emphasized that I am neither a botanist nor a zoologist but a historian who approaches the scientific work of Linnaeus and his apostles from a historical perspective. Hence, I will not be studying the science of these travellers as such; my focus is rather on the social and cultural context in which they lived and the conditions and circumstances affecting – in some respects even governing – their scientific work. Most of the paper is based on research carried out in a recently completed project where I, together with my colleague Hanna Hodacs, investigated travel as a scientific and educational practice in the eighteenth century with an emphasis on Linnaean travel (Hodacs & Nyberg 2007).

For those who are well acquainted with the issues in question, it is important to stress that what follows will to some extent be a review of current scholarship on the topics being discussed. In other words the paper is largely based on a survey of

existing studies, although incorporating on a few occasions examples from my own research into the primary sources. For this reason, there may be few entirely new empirical findings revealed or elaborated in the following pages. Nevertheless I hope that my examination and discussion as a whole will provide some new insights and suggestions, thereby contributing to our understanding of Linnaeus' apostles, scientific travel and the East India trade in the eighteenth century.

Scientific travel in the eighteenth century

The eighteenth century witnessed a breakthrough of both long distance travel in general and writing about such travel in many European countries. Of course these phenomena were by no means new, but the fact remains that this was a century "in which non-fiction travel literature achieved an unparalleled popularity" (Batten 1978:1). A related development was the emergence of a new genre of travelogues aiming to simultaneously inform and entertain their readers. This was an important characteristic of the period, as European travel writing both earlier and later has tended to be divided into either descriptive, fact-filled guidebooks or semi-fictional narratives of travellers' experiences and adventures "abroad" – in the widest sense of the term (Batten 1978).

In this context, the relatively new and rapidly expanding field of natural history in its Linnaean form was unusually well suited to meet the demands of readers. It was firmly rooted in science, yet at the same time quite accessible to the public and easy to grasp for almost anyone; one of the very reasons for the popularity and success of the Linnaean system even among scientists was its practicality and relative simplicity. It could be used, at least in a rudimentary way, with very little preparation in terms of formal training (Eriksson 1978).

It was not least due to natural history and the increasing number of scientific travellers that travel in general gained new momentum in the eighteenth century. Indeed, as Christensson (2001:32) has put it, this was "the century *par preference* of the scientific journey." Travel had long been seen as an important source of knowledge, but then mostly in connection with the "apodemic" tradition of travel writing which aimed at maximizing the individual's acquisition of knowledge during educational journeys (*grand tours* etc.) in Europe. Now, however, travel increasingly became a method for producing knowledge of the hitherto unknown,

i.e., scientific and scholarly research in the modern sense of the word (Eliasson 1999:38–58; Stagl 1995). In the words of Sörlin (1990–91:79) travel was "scientified" and became a method of scientific investigation in its own right, comparable with that of the experiment. It is generally agreed that both Linnaeus and his students played a more or less important part in this process.

Travel as a scientific method

Of course, travel over long distances, even to other continents, was nothing new in the eighteenth century, and in the field of natural history it was almost by definition an essential activity which hade been practiced long before Linnaeus' time (Hodacs & Nyberg 2007:43). As Jonsell has pointed out (2005:79–80), botanical (and to some extent zoological) expeditions by Europeans to Asia, Africa and the Americas had been undertaken as early as the sixteenth century. Linnaeus himself wrote in the *Critica botanica* (1737) and elsewhere that all the truly great botanists had travelled in order to advance their science, often making tremendous sacrifices and sometimes even losing their lives (Sörlin 1989:109; Sörlin & Fagerstedt 2004:40–41; Jonsell 2005:80).

The contribution of Linnaeus, in this respect as in so many others, was that he took something old and combined it and systematized it in a partly new way or used it in a new context. In this case he combined traditional practices of botanical excursions with apodemic tenets on the one hand and his own new principles of systematics on the other. The end result was a method of scientific travel that, at least ideally, was characterised by discipline and order, efficiency and a consistent focus on collecting as much material as possible as quickly as possible (cf Eliasson 1999 and Jonsell 2005).

There can be no doubt, then, that Linnaeus played an important role in developing the principles of natural history travel in the eighteenth century; he was one of the great "ideologues" of travel as a scientific method at the time (Sörlin 1990–1991:79). His claim, however, of almost single-handedly having come up with the notion of scientific expeditions to distant countries and then inspired other nations to follow his (and the apostles') example is not entirely truthful. One objection would be the wide-ranging travel activity just outlined above, demonstrating that it was a larger phenomenon across Europe at the time. Also, it is apparent from existing sources that Linnaeus with interest had monitored the progress of early ex-

peditions organised by other countries, among them Russia, although he subsequently claimed that it was the Russians and other "foreign nations" who had imitated the Swedish example (Hodacs & Nyberg 2007:177–178; cf Jonsell 2005:80).

From coastlines to continental interiors

Regardless of where the notion of long distance scientific travel originated, it is clear that such travel multiplied in the course of the eighteenth century. Linnaeus himself was an example of this as he owed much of his later career to a journey to Lapland in northern Sweden in 1732. A few years later the area was revisited by an international scientific expedition led by Maupertuis, sent out with the objective of determining the exact shape of the Earth. At the same time a twin expedition (not led by but known under the name of La Condamine) was sent to South America for the same reason (Pratt 1992:15–24). During this period, the German naturalist Gmelin spent ten years (1733–43) leading a Russian expedition exploring Siberia – the very one mentioned above which had caught Linnaeus' eye so early.

These are but a few examples of many, showing quite clearly that the "apostles" of Linnaeus were far from the first or only travellers pursuing research in natural history. However, it is also obvious that the apostles participated, more or less prominently, in the early history and development of a new type of scientific travel covering ever greater distances. One of the characteristics of this process was a shift away, both in travel and in writing about it, from an earlier emphasis on navigation and the mapping of coastlines to the exploration of continental interiors. According to Pratt (1992:23–24), this shift can be directly linked to the evolution of colonialism from a focus on establishing coastal trading posts to conquering and controlling entire territories, i.e., substantial areas of land and the people(s) living in it.

To the extent that this observation is valid, the travelling naturalist may have been "a benign, decidedly literate figure" (Pratt 1992:27) without any weapons or other threatening attributes, but nevertheless he was (according to Pratt) part of an enterprise intimately and deeply connected with European colonialism. In such a perspective, Linnaeus' apostles all became involved in the greater process of European expansion and the ensuing appropriation of other countries and peoples, and hence also in the debate on (post-)colonialism that have been raging among scholars for a few decades now (Pratt 1992, Said 1995). As it is a very different dis-

cussion than the one in focus here, however, I will not elaborate further on this aspect.

The "apostles" of Linnaeus

It is against the background outlined above that we should consider the "apostles" of Linnaeus and their travels. Without a doubt they represent a remarkable chapter in Swedish history, but in a European perspective maybe they were not quite as unique as many Swedes would prefer to think (and Linnaeus himself would have them think). This does not in any way make them less interesting, as it only underscores the simple fact that they were human beings belonging to a historical context influencing them and their work. But what do we mean by "apostles" and who were they?

Who were the apostles?

The meaning of the expression "Linnaeus' apostles" is actually somewhat ambiguous. On the one hand, the term conveys a very specific notion of how to interpret and understand the travels of these individuals, on the other hand the meaning of the word is far from precise as it has been used in so many different ways in different contexts. Yet, it is difficult to entirely avoid the expression as a brief discussion of its meaning may contribute to our understanding of Linnaean travel. Hence, by the "apostles" of Linnaeus I am referring to students (or former students) of Linnaeus who engaged in scientific travel on foreign soil, mainly beyond the borders of Europe. With this definition, albeit somewhat vague, we have a group of 18–20 young men who, between 1746 and 1779, travelled as naturalists to various parts of the world. They visited North and South America, Africa, Asia and Australia as well as what is today called Oceania; sometimes the journeys lasted a few months, in other cases almost ten years.

It was Linnaeus himself who introduced the term "apostles" to denote his travelling disciples. As far as we know, this label was first used around 1750, when Linnaeus was compiling a list of the travellers as they were covering the world at the behest of their teacher. In printed versions of this list, for instance the preface of the global flora *Species Plantarum* (1753), the travellers were called "disciples." This was the word most commonly used in Sweden at this time for the students of

a university professor, and Linnaeus too usually referred to his students, whether they were prominent or not, in this way. Hence there is little point in reading into this particular word any messianic overtones on Linnaeus' part as suggested by Pratt (1992:25) and others. As for "apostles," however, that was a choice of words apparently peculiar to Linnaeus, and it is probably no coincidence that the term does not seem to have been used in print during his lifetime as it might have caused offence in public (Nyberg 2005:39). Where it does appear is in manuscripts of autobiographical notes dictated in the early 1750s to the student (and soon to be apostle) Pehr Löfling, where it is used to describe the group of former students then travelling in various parts of the world (Malmeström 1957:24).

To Linnaeus, the word "apostle" had a very specific meaning (as already suggested). He saw himself as a "reformer" of botany, someone who in modern language had not only reformed but revolutionized the entire science of botany single-handedly. ("Reformer" is here directly associated with great religious leaders and reformers of the Church like Martin Luther, as the term used by Linnaeus, "reformator", is the same as the title usually accorded to Luther in a Swedish context.) He perceived of this revolution in explicitly religious terms, speaking of "the faithful," "martyrs" and "heretics" in relation to his new teachings in botany and, to a lesser degree, zoology (Lindroth 1965–66:111–113).

In this context, the travelling students or disciples were "apostles in the most literal sense, and Linnaeus expected them to spread the light from Uppsala to the world" (Lindroth 1965–66:111). Put differently, to Linnaeus the apostles were an instrument of his own scientific work and they had a double mission: to spread the gospel of his new botanical principles among the scientists of Europe and to contribute to the empirical basis of his new system by collecting plant materials in other parts of the world. Throughout his life, he consistently represented the travels of his students as a part of a great project initiated, planned, organized and coordinated by himself.

Historiographical discussion

This view of the apostles, which I would like to call "Linnaeus' perspective", has had a tremendous impact on how historians have interpreted the lives and works of these travellers ever since (for a more detailed review and analysis, see Hodacs & Nyberg 2007:17–35). In general the apostles have been seen as the loyal stu-

dents of a charismatic and caring, but demanding, teacher, willingly risking their own lives while executing his instructions. This has been the position taken by many scholars within the field of traditional "Linnaean research." An alternative view, gaining some momentum in the last few decades, is that the students were instead the (more or less helpless) victims of the manipulation of Linnaeus, who exploited them for selfish reasons (in short, to get specimens). The common denominator is that in both cases Linnaeus is the active party: it is his intentions the apostles are executing, his instructions they are trying to obey. They themselves are only reactive or passive participants in a centrally co-ordinated, grand project conceived and orchestrated by Linnaeus.

It is true that some scholars have pointed out that Linnaeus' role as initiator and organizer varied from one case to another, and that his active involvement gradually declined over time (Jonsell 1993). Yet the apostles and their travels over several decades (anywhere from 33 to 53 years, depending on how you count) are still often summarized with a few words to the effect that Linnaeus "sent out" or "dispatched" his students and led them from his headquarters in Uppsala (see, e.g., Fries 1903, 2:26–71; Lindroth 1967, 1:630–631 and 663; Kjellberg 1974:279–287; Sörlin 1990–91:80–81; Pratt 1992:27; Nyberg 2001:44; Sörlin & Fagerstedt 2004: 16–17). It also seems clear that it is this interpretation which has influenced more "popular" representations of the apostles and their travels as well.

For all its influence, however, this view of the apostles is so generalized and simplified that it must be questioned in several respects. First, the very fact that the expeditions carried out by the apostles spanned several generations should be reason enough to be cautious in making broad generalizations. Second, the circumstances surrounding each traveller varied greatly even in the early years and tended to undergo changes over time; for instance, it was really only in the first group of travellers in the 1740s and early 1750s that Linnaeus was the main driving force behind each journey, while initiatives in the last few decades often came from other parties – foreign governments, private individuals or the "apostles" themselves. Third, as I have already suggested above, much of the scholarship on the apostles is essentially based on Linnaeus' perspective and, more to the point, on sources originating with him or produced in situations where students were addressing him directly. This entails a systematic tendency to exaggerate both his

role as such and the degree to which there was a previous, all-embracing "master plan" behind the events that unfolded.

When examining sources emanating from the apostles themselves and not intended for Linnaeus' eyes, the question of the origins and the organization of their travels becomes considerably more complicated. Space does not allow us to go into greater detail here (see Hodacs & Nyberg 2007, chapter 6), but as I have already suggested Linnaeus' role in the travels of the apostles gradually declined over time. There is also reason to question the notion of the travelling apostles as one, coherent project of exploring the world conceived by Linnaeus already in his youth. Rather, the available evidence suggests that the idea of sending out students to various distant parts of the world came to Linnaeus gradually over the years as opportunities appeared. It is true, however, that the expeditions of the apostles did accord well with ambitions he had very early on of compiling a flora covering all the known plants in the world.

As Jonsell has emphasized, it is important not to view the apostles as a homogenous group. It is true that "the travelling apostles [...] could be said to incarnate, or by definition belong to, the Linnaean tradition. However, these travellers were independent personalities and, albeit to a varying degree, original and in a few cases pioneering scientists." (Jonsell 1993:41) This does not mean that Linnaeus was not a very important figure for the apostles, but perhaps it was not always as the organizer of expeditions; in some cases his role was more that of a mentor and a source of inspiration. More pragmatically, to all of his students – apostles and others – he was also a person of great influence with many potentially useful connections.

Because of the enduring focus in so much scholarship on the role of Linnaeus himself and, as a consequence, on each apostle's personal relationship with him, perhaps we have tended to see the apostles as individual heroes – whether through their loyalty to their teacher or their willingness to sacrifice themselves for science. For the type of long distance travel we are concerned with here, however, scientific research required substantial logistical support and various types of infrastructure. As Jonsell (2005:85–86) has also pointed out specifically in the case of Linnaeus' apostles, those who lacked such support had limited chances of achieving substantial results. It was for this reason, and others, that the East India trade were so important for the apostles and other scientific travellers of the time.

The East India trade and the role of the SOIC

Looking at a map of the journeys of Linnaeus' apostles, the connection with East India trade becomes quite obvious. Many (but far from all) of the travellers used the East India route which, according to Jonsell (2005:80), was "the beginning and the precondition" of the whole story of Linnaeus' apostles. However, this connection (as the quote suggests) was more complex than one would think at first glance, and before discussing in detail the role played by the Swedish East India Company it might be worth while to outline the various aspects of the relationship between scientific travel and East India trade.

Significance of the East India trade

At the most general level, the East India trade was of course a fundamental reason behind the expansion of both long distance travel and natural history in the eighteenth century. It was through the establishment of sea routes to "the Indies" in the preceding centuries, and not least the accidental discovery of the Americas while searching for those sea routes, that both the "Old world" and the "New" had been opened up to various forms of European activities including scientific exploration. The growth of commercial and other contacts with East and Southeast Asia, as well as the expansion of European colonies in the western hemisphere, inspired both a general interest in these continents, their flora and fauna, and created a need for commercially (and perhaps politically) useful intelligence on distant countries. East India trade, in other words, provided some of the most important basic incentives for scientific travel.

Second, once these incentives were in place, the ships of the East India companies naturally represented the best opportunity of transport for natural historians and other scientists. These ships were, at least in the first half of the eighteenth century, from a practical point of view almost the only way of travelling to the East Indies (for the West Indies the options were a little more varied). In the second half of the century dedicated scientific expeditions began to be organized (primarily by the British) to even the most remote parts of the world, but this entailed staggering financial costs which were not within range for the great majority of scientists (and not at all for the apostles of Linnaeus). For practical and financial reasons, then, the East Indiamen were the best way for scientists to travel not only

to East India but also to Southern Africa and the islands in the Atlantic and Indian Oceans frequented by these ships.

Third, and perhaps most importantly, the East India companies could provide the travellers with infrastructure which was absolutely essential for any scientist who wanted to be able to concentrate on actual research. The logistical issues and other obstacles facing the natural historian in a foreign country or even a different continent were tremendous; without support of various kinds they could quickly become insurmountable. Here – and this is a crucial point – travel on board East Indiamen did not mean only transportation from one point to another, but transportation from one *port* to another, and in each port there would be facilities providing protection, supplies and communications. The last of these was not least important, as a successful explorer would regularly have to send home letters, descriptions and reports as well as large shipments of specimens which otherwise would have been prohibitively expensive or simply impossible to organize. Of course, following the established routes also made it more difficult to explore truly new areas, which could diminish the scientific value of one's findings (Jonsell 2005:84), but that was a risk many natural historians were willing to take.

Finally, we might add that the East India companies were one of the beneficiaries of scientific research by travellers such as Linnaeus' apostles. Typically, these visitors would not only describe the flora and fauna of their destination countries (some parts of which naturally had a commercial interest as well), but they also documented a great deal of data on the economy of the visited areas: agriculture, handicrafts, manufactures and trade etc. This was a point of common interest for East India companies on the one hand and scientific academies and societies on the other, in many European countries leading to the establishment of (formal or informal) collaboration between them. This relationship is perhaps more apparent in the case of Sweden than anywhere else, and it was to a large extent Linnaeus and his apostles who embodied the links between the SOIC and the Royal Swedish Academy of Sciences.

The SOIC, Linnaeus and the Academy of Sciences

The co-operation between Linnaeus, the SOIC and the Academy of Sciences has been the subject of much scholarship throughout the years. It is a famous collaboration, once immortalized by Sten Lindroth who wrote about the "trinity" of Lin-

naeus, the SOIC and the Academy of Sciences and the role it played in the golden age of Swedish scientific travel as represented by the apostles (Lindroth 1967, 1:631). While there may be cause for caution as to the extent of this co-operation and the degree of its success (as Lindroth himself also noted), without a doubt it is an extraordinary chapter in Swedish intellectual and cultural history.

The Swedish East India Company (SOIC) was founded in 1731, with the first ship departing for China the following year – only three months, in fact, before the young Carl Linnaeus set out on the journey to Lapland which would mean so much to his own career and to his future apostles. In its 74 years of active operations (formally it was dissolved only in 1813), the SOIC dispatched 37 vessels on a total of 132 voyages to China and, in a few cases, India (Söderpalm 2000:256–259; Frängsmyr 1990:43–46). The *economic* significance of the SOIC has been much debated and there is still a wide range of different opinions on the matter. It seems clear, however, that while the Company at one time represented c. 10% of the tonnage of the Swedish merchant fleet and 20–30% of total exports based on value (Koninckx 1980:404–405; cf Metcalf 1988:7), the economic effect of the SOIC on the national economy of Sweden as a whole was not tremendous; it certainly cannot be compared to the operations of the British or Dutch companies (Heckscher 1944:200–201, 223 and 230; Åberg 1990:100). However, as Metcalf (1988:20–21) points out there are also other aspects to consider: "[The SOIC] funneled foreign expertise, experience, and capital into Gothenburg, where they were harnessed to teach the Swedes transoceanic navigation and trade in general, and the East Indies trade in particular." In a similar vein, Heckscher has argued (1944:201) that the Company's more enduring importance to Swedish history lies in the contacts with "wider horizons" and the cultural influences it engendered in a country which was otherwise relatively isolated.

For these contacts and influences, the apostles of Linnaeus were of considerable significance. The relationship between the SOIC and the Academy of Sciences did not begin with them, however, but was established almost from the moment the Academy was founded in 1739. Linnaeus was one of the five or six original founders of the Academy and also served as its first president (a post rotating among members at three-month intervals). From the very start the Academy was careful to nurture its connection with the SOIC by admitting directors of the Com-

pany as fellows, often in (explicit) return for specific favours or donations of scientifically interesting objects.

As Lindroth points out (1967, 1:630), the Academy soon became "unusually active" (compared to similar institutions in other countries) in promoting travels of exploration, and he traces this activity to the influence of Linnaeus. However, the Academy in and of itself did not have the necessary funds for this type of enterprise, and hence there was a need to turn to the Crown, to commercial companies such as the SOIC and even foreign ambassadors (as in the case of Pehr Löfling who travelled to Spain and later South America). The most successful of these external collaborations was the one with the SOIC, and it is in this context Lindroth writes about the "trinity" of Linnaeus, the SOIC and the Academy and its role in furthering Swedish travels of exploration to distant countries (Lindroth 1967, 1:630–631).

It has often been suggested that Linnaeus came up with the idea of using the SOIC for scientific travel in 1735–38 while staying in Holland, where he could observe first-hand the opportunities for such projects yielded by the Dutch East India Company (VOC); his employer for several years, George Clifford, was one of that company's directors (Koninckx 1980:410). In some respects (but not all) there is a Swedish parallel to Clifford in Magnus Lagerström, a director of the SOIC who perhaps was the single most important catalyst for promoting scientific work within the company (Lindroth 1956:151). As we will see below, it is doubtful how strong the support was for such activities in the SOIC as a whole; the co-operation with the Academy rather depended on the passive or active sponsorship of interested *individuals* in senior positions, and here Lagerström was obviously a key figure. Not only did he try to help Linnaeus in securing passage on the company's ships for the apostles, he also very actively encouraged other travellers (officers, surgeons and priests) to carry out scientific research en route to and from East Asia. In 1748, he was himself elected a fellow of the Academy of Sciences.

Travellers using the East India route

Throughout the latter half of the 1740s, Linnaeus (and apparently Lagerström) worked tirelessly to secure a formal commitment of the SOIC to provide free passage for his students travelling to Southern Africa and East Asia. At one point he believed he had succeeded, but it turned out to be a misunderstanding (perhaps a

misinterpretation caused by wishful thinking on Linnaeus' part). What the Company finally agreed to in 1750 was a requirement that only persons with some scientific training would be appointed as priests and surgeons on its ships. By that time, however, this requirement had already to some extent been practiced for several years and a few students of Linnaeus had been sent out (Lindroth 1967, 1:635–638). The first one, Christopher Tärnström, left Sweden in early 1746 but tragically died at the end of the same year before ever reaching China (Söderpalm 2005). The second, Carl Fredrik Adler, did survive but the results from his journeys (he made several in the years 1748–1761 as a surgeon) seem to have been very modest (Fries 1903, 2:38).

At the same time as Adler another student of Linnaeus, Olof Torén, also set out for China but not much is known about the outcome of his first journey; it also appears that he had only spent a brief time with Linnaeus in Uppsala before his departure. Soon after his return Torén embarked on a second voyage in 1750, this time taking him to both India and China; afterwards he wrote a series of letters to Linnaeus recounting his experiences. It is not known in detail what he achieved scientifically during this journey, even though it is said that he brought home a fairly large number of specimens and Linnaeus named the genus *Torenia* after him (Torén 1953). It is quite possible that his collections were included with those of other travellers and forwarded to Linnaeus by Lagerström, rather than being sent directly by Torén himself.

The last of the "apostles" in this early group of SOIC travellers, and without a doubt the most successful from a scientific point of view, was Pehr Osbeck. He travelled once to China in 1750–52, making the journey at the same time as Torén's second tour but sailing on another SOIC ship. En route to Canton he was able to make short stops in Spain and on Java, collecting large amounts of (mostly) plants everywhere. He brought home at least 600 different species to Linnaeus, who was very pleased with the results (Hodacs & Nyberg 2007:156–157).

There were also other travellers with the SOIC who carried out scientific work while on board, but of the apostles only one more would follow after Osbeck (and Adler, who was still making journeys to the East Indies for many years but apparently without any scientific objectives). It was Anders Sparrman, who at the age of 17 went to China in 1765 with the East Indiaman *Stockholms Slott*, returning two years later and in 1768 defending a dissertation under Linnaeus which was mainly

concerned with butterflies. Sparrman was also able to get free passage on an SOIC ship when he went to Southern Africa in 1772, as well as when he returned home from there in 1776 (in the meantime he had, of course, joined James Cook for his second voyage around the world in 1772–75). Finally, at least one more apostle received free passage with the SOIC in a similar way: Pehr Löfling, who travelled on a company ship from Stockholm to Porto in Portugal on his way to Spain. In addition to those mentioned here, Carl Peter Thunberg also travelled to East Asia, but he did so as a surgeon in the service of the Dutch East India company.

The years 1746–48 was the period of Linnaeus' most intense lobbying on behalf of his disciples, to get them funding for travel and positions on ships sailing to other parts of the world. This work, with all the practical, financial and logistical issues it entailed, is one of the major themes of Linnaeus' frequent letters to the Secretary of the Academy of Sciences of the time (later published in *Bref och skrifvelser*, vol. 1:2). One of the clearest examples of the Academy supporting a student of Linnaeus is Pehr Kalm, who however travelled to North America and thus was not connected to the SOIC. Another prominent apostle who did *not* use the East India route was Fredric Hasselquist, who set out in 1749 for the Eastern Mediterranean. By May 1751, when Löfling – one of the most brilliant students of them all – left Stockholm for Spain, Linnaeus had no less than five disciples travelling in four different continents carrying out scientific research. It was around this time he began referring to his exploring students as his "apostles" (Malmeström 1957:24).

During this first, and most intense, phase of the travels of the apostles Linnaeus was generally involved quite deeply in the planning and organization of the journeys. In his mind, and possibly in the mind of at least some of the students, these expeditions were made on Linnaeus' behalf and he expected to receive specimens for his herbarium when travellers returned. The apostles, meanwhile, were expected to write travel accounts which would be published in their own names and duly enrich natural history as well as the general knowledge of visited countries. Perhaps Osbeck and Hasselquist are the most obvious examples of this distinct "division of labour" between teacher and students, and to some extent it also applies to Kalm. In his case, however, the situation was more complicated despite the fact that Linnaeus had been very active in promoting, securing funds for and organizing that expedition; Kalm appears to have been more independent than

many of his fellow apostles and at the time of departure he was somewhat older than most of the others. Maybe the fact that he had already been made a professor when he set out also played a part.

Beginning in the early to mid-1750s, a gradual change in the character of the apostles' travels is setting in. After c. 1753 there are few examples of Linnaeus actively initiating, organizing and co-ordinating an expedition in the same way as he had done in previous years. Instead, there is a shift towards external initiatives or students themselves suggesting travel projects and executing them with the more or less active help of their former teacher. Several of the very last of the apostles, e.g., Solander and Thunberg, first went to major European cities (London and Amsterdam) before they were offered the chance of taking part in an upcoming expedition; in such cases, the role of Linnaeus was sometimes reduced to writing a letter of recommendation and hoping, rather than expecting, to receive some of the collected specimens when the traveller returned.

A balanced assessment

As should be clear by now, the East India trade in general and the SOIC in particular were of crucial importance to the travels of Linnaeus' apostles. In one sense, the East India trade was a precondition of these travels in the first place, as it was responsible for creating the incentives as well as the opportunities for scientific travel to Africa, Asia and (by extension) the Americas. Many, but not all, of the apostles did use ships of the SOIC or other East India companies in order to carry out their scientific work, and at their destinations they could take advantage of company infrastructure in the form of protection, supplies and communications. Others were able to get free passage on board SOIC ships to Europeans ports, from where they could later go on to destinations on other continents. In short, the SOIC was indeed instrumental to most of the apostles in one way or another.

At the same time it is important not to exaggerate the role played by the SOIC, or idealize the character of its co-operation with scientific institutions such as the Royal Swedish Academy of Sciences. As we have seen, despite massive efforts by Linnaeus – and other members of the Academy not mentioned here – there was limited willingness among the directors of the company to formally concede any general privileges such as free passage to Linnaeus' students or other scientists. The commitment finally made was relatively minor and had little real effect. What

co-operation did exist was largely informal and its most active phase was short-lived, culminating in the few years immediately preceding and following 1750.

Another factor to consider is how much impact the concessions made by the SOIC actually had on the working conditions of the travelling scientists. Although the evidence on this point is mostly anecdotal and should be treated with caution, it seems that despite the public support of the company, conditions for scientists on the ships were very difficult. When Osbeck returned from China in 1752, he complained to Linnaeus (and apparently to many others) of the limited opportunities for research, the small cabin which made serious work almost impossible, the lack of understanding from both officers and crew and so on. (Letters to Linnaeus quoted in Fox Maule & Hansen 1972–74:101–102, 112, 114–115, 116 and 125) Similarly, it has been suggested that the very first apostle, Tärnström, also was the object of ridicule from shipmates who had little appreciation for the value or meaning of his scientific work (Lindroth 1967, 1:634).

Ignorant and jeering sailors aside, it is a material point for our purposes here that there were obvious and very clear limits to the support that the SOIC was willing to lend scientific travellers. What that support amounted to in the end, was that persons with some training in natural history were preferred when priests and surgeons were appointed, but their scientific work was only tolerated when it did not interfere with regular duties on board. In other words, the undisturbed running of day-to-day operations always took the priority over scientific concerns. This is hardly surprising and only natural since the SOIC was a commercial company whose aim was to generate a profit for its shareholders. However, it is an important point to make in order to put the actual role of the SOIC in perspective and to better understand the nature of that role. It also leads us on to another aspect of the apostles and the East India trade which to me seems to be of some significance: the distinction between "utility" and "curiosity" as opposing – or at least different – scientific ideals.

"Utility" and "curiosity" as scientific ideals

A recurring question in much scholarship on the apostles of Linnaeus is (not surprisingly) how successful they were. The answers to this questions have differed sharply over the years. Fries, an early biographer of Linnaeus, tended to emphasize

the great importance both to Sweden as a nation and science more generally of Linnaeus' own journey to Lapland and the travels of the apostles (Fries 1903, 1:86 and 2:26–71). In more recent research the opinions have been decidedly more mixed, with some scholars concluding that the travels of the apostles were all but complete failures from a scientific point of view (Koerner 1999).

Ultimately, however, the assessment of the apostles' achievements will depend on the criteria we use. In this respect there were at least two different sets of incentives for research driving both Linnaeus, the apostles and other contemporary scientists. On the one hand there was the view that the purpose of science must always be "useful" or "profitable" in a very tangible, preferably material sense; this so-called utilitarian approach to scientific inquiry is generally seen as a pervasive influence in the middle decades of the 18th century, perhaps more so in Sweden than in any other country (Liedman 1989). On the other hand, there was also an ideal of science for its own sake, knowledge as an end in itself regardless of its potential benefits to human economy or society. In most works on Linnaeus both of these views, which we may sum up with the words "utility" and "curiosity", are mentioned or acknowledged. However, the explicit relationship between them and how they were perceived in Linnaeus' time does not seem to have been fully investigated yet, at least not in this context. Neither is that the purpose here, but it should be pointed out that this aspect is essential to any assessment of how successful (or not) the apostles of Linnaeus were. It is also necessary for a thorough understanding of the connection between Linnaeus, the SOIC and the Academy of Sciences discussed earlier.

Science in general and natural history in particular was immensely popular and enjoyed tremendous prestige in Sweden around 1750. This popularity was intimately connected to an economic and political program characterised by utilitarianism and mercantilism. Lindroth (1957–58) stresses that these ideas were a necessary precondition for the spectacular scientific achievements of Sweden at the time, since they legitimized support for projects such as the travels of Linnaeus' apostles. This support was explicitly based on the hope that science would yield results that could be exploited to the benefit of the nation's economy, and in this regard the outcome was generally disappointing. Partly as a consequence of this, the enthusiasm for science, including natural history, faded from the 1760s onward (Johannisson 1979–80:110–114; Lindroth 1967, 1:640–641).

This broader pattern holds true also when looking more closely at the apostles of Linnaeus and their accomplishments. While Linnaeus himself was driven by both "utility" and "curiosity", the public support he was able to secure from the Academy of Sciences and the SOIC for individual travel projects was largely based on the expectation that the voyages would lead to economically useful knowledge. On the whole these hopes were never realized – on this point, it seems most scholars can agree. For instance, Pehr Kalm who went to North America was himself a firm believer in the usefulness of science, but returned with plants that came to have very little (economic) use, if any. On the other hand, it is also obvious that Kalm at the same time made very important contributions to our knowledge of American flora and hence to more "fundamental" or "basic" science (Lindroth 1967, 1:653). To a varying degree the same is true for many of the other apostles as well: the economic results were disappointing but in terms of "pure" science they made considerable achievements (Lindroth 1967, 1:653; cf Sörlin 1990–91:87 and Jonsell 2005). This also means that if, like Koerner (1999), you emphasize the economic and utilitarian aspect of the motives behind the apostles' travels, the conclusion will certainly be that the outcome was a great disappointment and possibly represented a complete failure.

The scientific ideals of Linnaeus and his apostles

Looking at both Linnaeus and his apostles it is clear that there were great variations between different individuals in terms of their scientific ideals. This is not very surprising, and there also seems to be a discernible shift over time from an emphasis on utility and economy towards fundamental research for its own sake. Naturally there is no strict line dividing these two approaches and they are not mutually exclusive; rather they constitute a spectrum where most apostles can be placed somewhere between the two extremes. As I suggested above, we can find Pehr Kalm quite near the utilitarian end of the spectrum, and he explicitly discussed the question of "utility" ("nytta" in Swedish) versus "curiosity" ("curieusitet") in several letters to Linnaeus. Among them is a passage written in Philadelphia in 1748, where he assures his superiors in Sweden: "For my part I have never wanted to bind my travels and observations to a mere curiosity, I have counted it for the very least I have learned from my [teachers] to consider utility

first and foremost; this is also how I am undertaking the present journey [...]." (*Bref och skrifvelser* 1:8:37–38)

Almost the opposite view can be found in a letter written only a few years later by Kalm's fellow apostle Pehr Löfling to Linnaeus. In November 1751, shortly after arriving in Madrid, Löfling asked his former teacher whether he should try to continue to South America or not, in the latter case first exploring Spain. He continued (Rydén 1965:93): "I wished the former, as it would let me follow my own nature more closely and Economy is more of an obligation to me, and that [i.e., Economy] would be my primary purpose if I remain in Spain, which I would escape in America, only tending to simple Nature, to which I believe myself to be better suited." In other words, nature as such rather than the economic uses of it was the main focus for Löfling in his work as a scientist.

One might ask if it was not a distinguishing feature of the Linnaean age of natural history that it marked a shift from the dominance of utilitarian ideals of science to a paradigm of basic research driven mainly (but not only) by "mere curiosity". Both of these aspects were clearly present in Linnaeus' outlook throughout his life (although many scholars tend to emphasize one or the other), but as the utilitarian vision faded and natural history as well as other scientific disciplines became more specialized the notion of scientific inquiry for its own sake gradually acquired momentum (cf Liedman 1989:43). The middle of the eighteenth century had seen a massive increase in the support for scientific work fuelled by hopes for economically useful results. As it turned out, the outcome in terms of material benefits was meagre, but instead there had been substantial gains in basic scientific knowledge. It is for this reason that today, no matter what the "utility" of it all might have been, we look back to this period as a golden age of science and of scientific travel.

Conclusion: the legacy of Linnaeus' apostles

How can we finally sum up the legacy of Linnaeus' apostles and the historical significance of East India trade in that respect? First, it should be acknowledged that especially in the early years much of the focus of Linnaean travel was on utility while the results rather satisfied the demands of curiosity and "pure" science. Second, it is also important to point out that many (but far from all) of the apostles

explored areas that were already fairly well known to science. That does not mean nothing new could be found, but for those apostles who travelled the East India route in particular the "novelty value" was perhaps not always very high (Jonsell 2005:84). Third, far from all of these students of Linnaeus were very successful, which might be worth reminding ourselves since there is a tendency to see the apostles as a more or less homogeneous group. Nevertheless, many did achieve much during their travels, and some of these contributions are still relevant and valuable to science today.

Quite aside from their actual findings and collections, however, there is also one last aspect of the apostles and their travels which should be emphasized. This is the fact that while the apostles may not have been quite as unique or as pioneering as travelling natural historians as Linnaeus often wanted the world to believe, they (and Linnaeus himself) took part in the process whereby the idea of the great scientific expedition to distant lands was established. In the eighteenth century, natural history was still a new discipline and it was during this period that much of the foundations of modern science – its institutions, practices, values etc. – was laid in both Sweden and other parts of Europe. Among those institutions and practices was the notion of the great journey as the basis of a lifelong scientific career, embodied by Linnaeus himself and students like Pehr Kalm and Carl Peter Thunberg, and inspiring later generations of travellers such as Joseph Banks, Alexander von Humboldt and Charles Darwin (Sörlin 1990–91: 79). For naturalists coming from a poor country on the outskirts of Europe, taking such a prominent part in that process would hardly have been possible without the incentives, the opportunities and the infrastructure provided by the Swedish East India Company.

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