

## **Globalizing Linnaeus – Economic Botany and Travelling Disciples**

**I**n Swedish history, Linnaeus and his travelling students, “the apostles” have had a place of honour. In the first comprehensive biography of Linnaeus and his apostles, a two volume work, published in 1903, Professor Theodor [Thore] Magnus Fries referred to them as “these pioneers of nature research” who, despite the fact that some of them “died the deaths of martyrs,” were not discouraged from joining the cause and “tread the same path of starvation...struggle...and death”.

In this way, through Linnaeus and his emissaries, Sweden became a great power in the field of natural history; the monument that each of them raised to himself has undoubtedly proved that it is and shall remain an *aere perennius* [eternal glory].<sup>1</sup>

This statement was of course part of the nationalist rhetoric that has been strong in the history of Linnaeus celebrations, not least for the bicentennial in 1907 and perhaps also this year [2007], although since the 1960's there has been modern, critical research on Linnaeus that can not be disregarded. Recent historiography on the travelling students has also noted the problematic aspects and put

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<sup>1</sup> Thore Magnus Fries, *Linné: Levnadsteckning*, vol 2. 1903, pp. 26-27.

much more emphasis on the general eighteenth century context of colonial science, commerce, and European expansion.<sup>2</sup>

The journeys made by Linnaeus' students from Uppsala University were unique in as much as they continued for half a century and comprised an unusually large number of travellers for the time. The journeys included voyages to all five known continents and sailing around the fabled Southern Continent - what we now know as the Antarctic.

The journeys were made in cooperation or close collaboration with many other nations. At least five, Denmark, The Netherlands, Russia, Great Britain and Spain, had one or more of Linnaeus' students onboard vessels flying their flag, while some students were

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<sup>2</sup> I have personally been quite involved in this work. In collaboration with radio and television documentary producer Otto Fagerstedt I have researched Linnaeus and his global natural history travel enterprise since the late 1980's. Our most comprehensive work is available in Swedish, *Linné och hans apostlar*, 2004. Other titles, by myself or co-authored with Fagerstedt, are: 'Scientific Travel, the Linnean Tradition, in *Science in Sweden: The Royal Swedish Academy of Sciences 1739-1918*, ed. T. Frängsmyr, 1989, pp. 96-123; 'Always Ask the Reason!: Documents from the Travels of Linnaeus and His Disciples' [with O. Fagerstedt], *Artes International*, 1994, pp. 64-83; 'La laponie, terre d'exploration' and 'Le Réseau scientifique', in *Le Soleil et l'Étoile du Nord: La France et la Suède au XVIIIe siècle*, ed. P. Grate, 1994, pp. 213-215, pp. 216-222; 'Opfer für einen Sammler', *Wunderkammer des Abendlandes: Museum und Sammlung im Spiegel der Zeit*, 1994, pp. 150-159; 'How Tedious It Is to Be a Bureaucrat: A Biographical Collage of Anders Sparrman: Traveller, Botanist, and Practitioner of Magnetism in the Last Days of the Enlightenment' [with O. Fagerstedt], in *Artes 1996: An International Reader of Arts and Music*, 1996, pp. 35-51; 'Ordering the World for Europe: Science as Intelligence and Information As Seen from the Northern Periphery', in *Nature and Empire: Science and the Colonial Enterprise*, ed. Roy MacLeod, *Osiris: Yearbook for the History of Science*, vol. 15, 2001, pp. 51-69; 'Science, Empire, and Enlightenment: Geographies of Northern Field Science', *European Review of History*, 13 (2006):3, pp. 455-472. For other recent works on Linnaeus and the disciples, see the bibliography at the end of this article.

part of land expeditions. Other nations offered support along the way. These nations were at the centre of empires with far-flung possessions and, in consequence, had a network of trading stations and administrative centres at their disposal, covering the greater part of the world, and an infrastructure capable of supporting such journeys, that the Kingdom of Sweden quite simply did not have.

Linnaeus managed to mobilise a large number of Swedish institutions including Uppsala University, the Royal Society of Sciences at Uppsala, the Royal Academy of Sciences, the House of Nobility, the East India Company, various authorities, the county governors of various provinces and Swedish legations abroad. Linnaeus also used his organisational skills to mobilise and encourage the royal household and the *Riksdag* of the Estates to support the journeys, although this was possibly even more for the sake of the useful benefits for science in general of which the economic nature of his natural history journeys in the Swedish provinces was a fundamental part.

Linnaeus was one of the world's most celebrated naturalists of the period. His system of assigning species and propagation in nature, commonly referred to as the sexual system, was praised on the one hand and awakened controversy on the other. His journeys were also renowned. His students were ambassadors for his system and were well known in Amsterdam, Berlin, London, Madrid, Paris and other centres of the sciences in Europe. Their reputation as experts reached everyone who understood natural history, wherever they lived in the world.

Many questions can be asked in an analysis of these travels. Why was the project undertaken? Did Linnaeus have an original plan and if so when did he develop it? How did he select the travellers he needed? How did he make sure that his travellers did as he wanted or did he quite simply rely on their ingenuity? What was the 'research environment' that Linnaeus organised in Uppsala that fos-

tered and trained his travellers? And, just as importantly, how, and why, were these distant and costly expeditions financed?

Similar questions could just as well be posed about the apostles' personal views. What drove them? What motivated their willingness to leave the security of home, particularly when the dangers of the expedition were well known? What effect did Linnaeus' personality and his much talked about energy and irrepressible zest have on the apostles? What was attractive in his personality and what offended?

Who is an 'apostle' – and how does one become one?

Who were these travelling students, or apostles as they are sometimes called? Apart from including them in his own successes and merits, as he usually did – for example in his five autobiographies – and often also in correspondence, he also made the following statement in a moving letter to his siblings and brothers-in-law in 1763: "I have arranged for my apostles to be sent to all the corners of the world".<sup>3</sup>

It was more than a fact. It was a grandiose declaration, an integral part of his long list of achievements: books, expeditions and memberships of European academies. Perhaps it was the divine calling he felt that reveals itself, or the incomparable leader's choice of expression. The word "apostle" implies that the travelling students were his messengers, emissaries for a way of thinking, a way of being, somewhat akin to the original biblical apostles.

Linnaeus seldom used the word. When he did it was in connection with his autobiographical texts, for example his notes from 1752 or 1753 where we read that Linnaeus had "his apostles all

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<sup>3</sup> Carl Linnaeus to Samuel Linnaeus, 22 March 1763, *The Linnaean correspondence*, linnaeus.c18.net, letter L3225 (acc. 8 september 2008), transl. by the author.

over the world.” In the same passage, Linnaeus assigns students travelling in Sweden to the same category.<sup>4</sup>

Linnaeus had several hundred students. Many of these carried out natural history travels. By no means, all of those were referred to by Linnaeus as “apostles”. Rather we are talking of some twenty students, some of whom returned to good careers, or not so good in a few cases, but half of them never returned at all. They were:

Carl Fredrik Adler, died of fever on the coast of Java at the age of 41;

Andreas Berlin, died at Guinea at the age of 37;

Johan Peter Falck, committed suicide as a drug addict in Kazan, Russia, at the age of 31;

Peter Forsskål, died of malaria in Jerim, Yemen, at the age of 31;

Fredric Hasselquist, dead of tuberculosis in Smyrna, Asia Minor, at the age of 27;

Peter Löfving, dead from malaria at a mission station in Venezuela, age 27;

Olof Torén, died after a trip to East India at 35;

Christoffer Tärnström, to whom we shall return.

Among the survivors were:

Carl Peter Thunberg, who travelled to Japan and became Linnaeus’ successor in the chair at Uppsala;

Pehr Kalm, who became a professor at the Academy of Åbo/Turku in present day Finland;

Anders Sparrman, perhaps the most eccentric of the travelling students, who played a small role in the history of abolition and human rights: and of course

Daniel Solander, the parish priest’s son from the far north of

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<sup>4</sup> Kenneth Nyberg, ‘Linné, apostlarna och de utrikes forskningsresorna’, *Sjuttonhundratalet* (2005), p. 48.

Sweden who was one of Linnaeus's favourite students and even had an affection for Linnaeus's daughter Lisa Stina – but who went to England and was “lost” to Swedish science but instead became an asset to the whole world, circumnavigating it with Banks and Cook and assuming the unsurpassable position in the history of mankind that is reserved for one who is the first to describe scientifically the kangaroo.

The success of an expedition was completely in the hands of those who participated. The travellers had to be sharp-eyed, have good stamina and, above all, be able to work independently as natural historians. The journeys were also physically demanding, a fact of which Linnaeus was all-too-well aware, following the hardships he had experienced on his expedition to Lapland, hardships he continually exaggerated.

Voyages to far-off continents could take years, and the fact that disease, storms and other dangers were to be expected was never in doubt. It was crucial in every way that the task was given to the right man.

Linnaeus had every opportunity to find his travellers. Students from far and wide attended his classes at Uppsala and he could keep an eye on them during lectures and excursions. But even Linnaeus had to have the skills and characteristics enabling him to spot talent and sort the wheat from the chaff. “A professor,” he writes in his letter to the Royal Academy of Sciences in 1752, primarily distinguishes himself by “*selectu ingeniorum* [choice amongst talent], because the right characters or observers are amongst the other hopefuls as comets amongst the stars.”<sup>5</sup>

The first apostle to be sent out, Christoffer Tärnström, was exceptional however. He was ordained and appointed chaplain on the

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<sup>5</sup> Thore Magnus Fries, *Linné: Levnadsteckning*, vol. 2, 1903, pp. 25–26.

East Indiaman *Calmar*. He was 35 and married with two children and hardly ever studied with Linnaeus, although they had been together on field excursions. It was a difficult voyage and the most difficult passage depended on the winds, without the right trade winds the vessel had to wait until the following year – Tärnström was unhappy.

We have little or no hope of catching the trade winds and will have to wait somewhere in the Batavian or Indian islands. It is only unfortunate for my dear wife and children, should something happen to me.<sup>6</sup>

God did not wish Tärnström to return home, and his fate – and the sorrow and despair of the widow, who demanded that Linnaeus take care of her for the rest of her life – taught Linnaeus a hard lesson: never recruit a married man. The people he entrusted to travel had to be well-qualified in botany and believe in their master's sexual system of classification. At the same time they needed to be young and single.

When he talked about his students, it was frequently just before they left on some expedition when sponsors were to be seduced and scientific doubters convinced. The forum normally comprised officials representing the Royal Academy of Sciences, the East India Company, the Court, or potential private donors. Here Linnaeus was in his element, he soon became a master of the rhetoric of conviction, an art he had many opportunities to practise. When Pehr Kalm was to be sent to America, Linnaeus wrote much about Kalm's physical advantages, factors that were considered just as important as the intellectual ones:

[...] in good health, of humble origins, able to live well on the worst and best of foods so that he may in every way be fostered

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<sup>6</sup> Letter from Tärnström to Linnaeus 3 May 1746.

to withstand whatever he has to endure. His interest in herbs, animals and rocks is so great that he is prepared to run many miles for one single lichen. He is the strongest man I have had in Botany and he is solidly grounded in that - - - now is the time, later on he will be heavy of foot, lazy and portly and too fat to run like a hunting dog through the forest.<sup>7</sup>

As time passed, there were many who heard they were “the strongest” Linnaeus had had “in Botany”. Tärnström had been so labelled, and Hasselquist, Löfling, Forsskål, Solander and Thunberg were also to earn that title.

Finnish Pehr Kalm was born in 1716, but was forced his parents to flee from Finnish Österbotten across the Gulf of Bothnia to Swedish Ångermanland – both provinces were parts of Sweden’s then-reduced Baltic empire. He had suggested a number of different travel destinations, including Iceland, but this was of no interest to Linnaeus, as it was far too similar to Lapland. Nor did the Cape and Palestine awaken interest and, initially, his interest in North America was half-hearted. Kalm’s fifth choice, China, was so much to Linnaeus’ liking, that he is reported to have “jumped for joy”. After some research, however, it became apparent that the China journey was not possible and the choice reverted to North America. The purpose of both journeys was, nonetheless, the same. By taking a northerly route, Kalm would be able to bring back plants that withstood the cold climate of Sweden.

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<sup>7</sup> Linnaeus to the Royal Swedish Academy of Sciences, 8 January 1746, pr. in Carl Skottsberg, ‘Pehr Kalm’, *Levnadssteckningar över K. Svenska Vetenskaps Akademiens ledamöter* [Biographies of fellows of the Royal Swedish Academy of Sciences], vol. 8 (Stockholm, 1951), p. 312.

### An economic enterprise

The expeditions were concentrated on species and classification but at the same time they were primarily, as Lisbet Koerner showed, decidedly economic in nature and aimed at domestic [Swedish] cultivation of useful plants collected with the purpose of reducing expensive imports. This Mercantilist, or *Kameralist*, idea was the real driving force behind this enormous travel project – and one which made it seem worth the while for private and public sponsors to carry some of the costs.<sup>8</sup> Linnaeus had a number of scientific and personal motives as well but it was economic botany that made the project possible.

Linnaeus acted when he saw an opportunity, when the right student was at hand and the funds available. He did not trouble his mind with solving problems or testing hypotheses in the manner expected of those who followed a “scientific programme”.

Comprehensive instructions to the travellers were more common at the initial stages of the enterprise. They became increasingly rarer and less comprehensive. With hindsight, and experience Linnaeus probably realised that specifying the mission in detail was a pointless exercise; the unpredictable was the order of the day for all of them.

Oral instruction must be assumed in most cases, but one of the early, demanding, instructions, was given in a detailed letter to Tärnström, his first explorer, who had not for a long time been at Uppsala. Linnaeus wrote:

Honourable Sir,  
When giving instructions for Mr. Tärnström to observe on his East India journey, the following would be useful.  
1. To acquire a tea bush in a pot or at least seeds thereof to be

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<sup>8</sup> Lisbet Koerner, *Linnaeus: Nature and Nation*, 1999.

kept according to the verbal instructions he has received from me.

2. Seeds from the Chinese mulberry tree with split leaves.

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13. Live goldfish for Her Royal Majesty.

14. Measurements night and day with a thermometer south of the Equator and in Canton.<sup>9</sup>

At the end of the day it was only point 14 that was, to some extent, fulfilled. There were no goldfish or tea bushes, the trophy that Linnaeus continually desired and that each and every traveller to China was urged to bring back – Pehr Osbeck finally succeeded in fulfilling Linnaeus' wish in 1755.

Linnaeus' instructions to the 22-year old Pehr Löfling, another early explorer who left for Spain where he later joined an expedition to South America, numbering 27 points, which included quadrupeds, birds, amphibians, fish, insects and vermin as well as trees, herbs, grasses, mosses, soil types, cultivation methods, plant usage and usefulness and their local names. Löfling was also expected to understand and report back on economy, geology, diseases, household medicines, to interview Spanish students, send home "a herbarium that included all the herbs in Spain" and "complete a perfect Flora and Fauna Hispaniae."

The most widely used words in the instructions were "everything" and "all things." Löfling was expected to study all plants and herbs, all animals, all types of soil, all types of rock and everything else. And as if that was not enough, Linnaeus urged the young man, who was little more than a boy, to "ask the reasons for everything."

Prior to Kalm's journey, Linnaeus produced a long list of im-

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<sup>9</sup> 'Instruktion till Magister Tärnström', in Linnaeus, *Bref och skrifter*, part 1, vol. 2, 1908, pp. 53-54.

portant tasks, the purpose of which was to demonstrate to benefactors how much there was to discover and bring back. One example on which Linnaeus particularly dwelled was the mulberry tree:

[...] imagine, if one could only find one species of mulberry tree that could withstand our winters how much silk we would not be required to buy from abroad and how many thousands of people could make a living for themselves in this way?<sup>10</sup>

It became an economic shopping list rather than a matter of science. Kalm well understood what was expected of him. He had also made a list of attractive plants that he hoped to bring back to Sweden:

8 different types of oak, mulberry trees, vines, chestnut trees, walnut trees, hemp, a grain named fol Avoine, an infinite number of legumes, medicinal plants, cedar trees, cypresses, sassafras, considerable numbers of roots, maple-trees of which a juice flows in the spring that the Canadians boil for sugar.<sup>11</sup>

In his instructions to Fredric Hasselquist, we know that during a botany lecture, Linnaeus pointed out that, curiously and sadly, the Holy Land was just as unknown as the East despite the fact that devout “Catholics” – a negative word in the Lutheran and quite intolerant Sweden – travelled there every year, but they made no efforts to examine animal and plant life. This was particularly regrettable as such knowledge could be useful when interpreting the Bible, a project that other learned men in Sweden had begun and that Linnaeus felt bound to continue; Hasselquist volunteered.

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<sup>10</sup> Linnaeus, memorandum to the Uppsala University board, 13 December 1746. Uppsala University Library.

<sup>11</sup> H. O. Juel, ‘Om Kalms bemödanden att i vårt land införa Nordamerikanska växter’ [On Kalm’s efforts to introduce in our country plants from North America], *Svenska Linnésällskapets årskrift*, 1930, p. 41.

Another apostle who clearly received instructions from Linnaeus was Daniel Rolander, who travelled to Surinam in South America where he spent a horrifying six months surrounded by jungle beasts and awful insects, and by the hard drinking Dutch upper class, the company of which turned him into a *de facto* alcoholic. The latter's list of instructions had over one hundred points and was typical of Linnaeus in as much as it focused on usefulness.

One of the specimens Rolander was to search for was *Quassia amara*, a plant that could cure typhus fever, a widespread disease that killed hundreds of Swedes every year, including in Uppsala. Rolander succeeded in describing the plant and carried out a great deal of other research in his extremely steamy jungle province despite the fact that he experienced great discomfort.

#### Research or collection?

Otherwise, any more detailed instructions in Linnaeus' own hand are lacking. Later apostles, including Sparman, Thunberg, Berlin and Afzelius, travelled privately and had a far more distant relationship with their former teacher.

Each journey had its own explorative, one might say inventive, method which was exactly the style of research that Linnaeus used and taught during his famous excursions and lectures at Uppsala and on his extensive travels in the Swedish provinces, from his first trip undertaken from 1732, when he travelled to Lapland in the north, through to his fifth and last in 1749, when he went to Skåne in the south.

This was also a recurrent theme of the critics at the time. Linnaeus did not do any research, he just collected, sniffed his adversaries. One can compare this with the rigorous research programmes carried out by other natural history expeditions of the time, for example the French expedition to the Pacific Ocean in

the 1780s with Lapérouse, or why not the Danish expedition to Arabia which set out in 1761 with Linnaeus student Peter Forsskål as a member. The expedition was planned in an exemplary manner with detailed reports by a number of Danish and German Orientalists.

In comparison with these projects, the outlines of the expeditions arranged by Linnaeus appear less-well organised and considerably more vague and tentative. Part of the explanation for this is the fact that Linnaeus had limited resources; first and foremost he had to rely on himself. Institutional support had to be organised separately and in new constellations for every project, and frequently with international participation.

#### The micro-economy of natural history travel

Taught and coached by Linnaeus, the apostles were as good as a multiplier of Linnaeus himself. He drew immediate and direct benefit from their work in as much as he received their consignments and could publish their results in his name; he even counted diaries and notebooks of his deceased students as his own work.

This could be referred to as the symbolic and scientific *micro-economy* of the expeditions, and Linnaeus controlled every aspect of it. When one of his apostles wished to take command of his findings and collection of natural-history specimens, Linnaeus could easily become displeased, as this was not included in the unspoken premise on which the whole project rested.

Most of the research work was unpaid and the apostles received no income from Linnaeus, although in a few cases they received help with their board and lodging. Those who travelled as ship's chaplains, doctors or otherwise were paid for their services but hardly any of the surviving apostles returned to Sweden with money in their pockets.

They may have regarded their natural-history specimens and curiosities as assets, a fact that was sometimes aggravated by the symbolic financial relationship they had with Linnaeus who believed he could lay claim to these assets in his own name.

This fact is well illustrated by the circumstances surrounding Daniel Rolander. On Rolander's return from Surinam in 1756, his relationship with an impatient and intolerant Linnaeus became successively more strained, so much so that Rolander determined to take his seeds to Copenhagen where he also sold his travel account, another asset, to one of Linnaeus' arch-rivals, Professor Christian Gottlieb Kratzenstein, and his herbarium to the botanist Christian Friis Rottböll.

If it was not the Catholics, it was the Danes...

Others returning with their "capital" in the form of herbs and precious travel journals were Anders Sparrman and Carl Peter Thunberg: their return was, however, so delayed that Linnaeus was unable to gain any benefit from their material. Indeed, when Thunberg eventually arrived at Uppsala Linnaeus was already dead. In earlier cases Linnaeus had taken charge of incoming material, unless the natural-history specimens went to foreign principals, as was the case with Forsskål and Löfling as well as Johan Peter Falck who was in the pay of the Russian Empress.

The way the voyages were arranged, however, generally resulted in the major costs never being settled. It would simply have been impossible. For the expeditions to be realised, it was almost a precondition that the infrastructure was provided by others, either the East India Company or a foreign expedition. Amongst the few exceptions to this rule were a few apostles who travelled overland on individual expeditions.

Pehr Kalm travelled through New England and Quebec on funds he had acquired from various sources, but as he wrote on his departure, above all, "my gracious and peerless Maecenas, Mr

Judge of Appeal of the Åbo Circuit Court of Appeal, Baron Sten Carl Bielke...”.<sup>12</sup> Kalm also used a different infrastructure, including colleagues, public officials, clergymen and natural historians on whom he called and with whom he could stay occasionally; these included John Bartram in Philadelphia and a future celebrity such as Benjamin Franklin.

Fredric Hasselquist also travelled across country and alone to Asia Minor where he died on the west coast of Turkey, in Smyrna (now known as Izmir) in February 1752. At that point Hasselquist had no money left and Linnaeus experienced this as a severe personal loss, not only had he lost a student but he was also concerned that the material collected would not be sent to him in Sweden. He managed to settle the issue with funds from the Queen.

#### Institution, networks, career

How are we to perceive this grand scheme of expeditions? At the outset, I posed a number of questions that in various ways relate to what, in today’s terms, we would call the research environment Linnaeus created at Uppsala. His energy – scientific, economic and patriotic – have all been mentioned; but how are we to view the scientific environment, or “institution”?

In one important aspect, this environment was a conscious creation, designed in harmony with the principles in which Linnaeus believed. Initially it rested on a combination of the characteristics of Linnaeus and his closest associates at Uppsala where he indisputably was a central figure at the university – he was made vice-chancellor on two occasions, and as time passed he became the university’s most celebrated professor.

He worked methodically. Bright and capable students were

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<sup>12</sup> Pehr Kalm, *Resejournal*, 4 vols., ed. Martti Kerklonen, *et al.*, 1966-88, I:5.

drawn to him and he took pains to see that he won their loyalty. In this work he mobilised considerable charm and powers of persuasion. The greatest attraction was nevertheless his reputation, both as teacher and researcher.

Linnaeus also took great pains to make sure that his work linked to international research, with which he both competed and collaborated. His visit to Holland in his early years might not have been planned in that light, but its most lasting effect was that it formed the basis on which he proceeded to build up an international network of contacts and peers. This was to prove invaluable for carrying out projects and sending his apostles to the far corners of the planet where they could gather material that he would otherwise have been unable to obtain.

In all this there is a certain existential, or even psychological, aspect that, with time, Linnaeus was forced to admit affected him in the form of depression and soul-searching. The not-insignificant loss of human life presented a problem for his large-scale methodology, and that it seriously shook Linnaeus' understanding of the world as a deeply teleological and moral divine order is well documented. He really did mourn the loss of his students, some of whom he was extremely fond of, particularly Löfving. He must have felt at least some self-reproach and pondered privately on his responsibilities, although in public he did not admit any mistakes, nor was he accused of wasting innocent lives. That kind of accountability did not exist.

The global division of work was, in its orchestration, also an important explanation of how it was possible to make his students travel; they realised, or were prevailed upon to see, that this was the route science had to take in order to assert itself. Linnaeus' own success was closely tied to the successes of his students, they were interdependent. On a moral level, such thoughts must have helped Linnaeus to legitimise his actions and perhaps even softened his

self-reproach, something that would otherwise have been more difficult. His own rhetoric argued that such a scientific programme, and thereby the sacrifices made, were undertaken for the benefit of Sweden's economic advance and gave it additional legitimacy.

Nevertheless, it is clear that this alone was not sufficient for Linnaeus' disciples despite the fact that those who were close to him were brought up to believe in the purpose and benefits of the project. Letters and notes written by the apostles clearly express the doubts they felt although the degree of influence was plainly dependent on their closeness to Linnaeus and, to some degree, on the development of their own careers.

Linnaeus' flattery and persuasive powers, which he used with his students as well as his sponsors, always played a role. This is one of the most conspicuous sides of Linnaeus' scientific and organisational management skills. He knew how to seduce and encourage young researchers to strive and gain good qualifications for a career in Sweden or abroad. He knew how to play the field and, in many ways, through correspondence or personal meetings, he personally knew his peers all over the world – at least during those years when he was at the zenith of his powers. In this way he controlled the careers of others, even if, as a matter of course, his adversaries could be used for unholy alliances.

How willing were the apostles?

The willingness among the travelling students to participate in expeditions varied. Concern was mixed with eagerness, but the overall pattern is that those who were dependent on qualifications and who had no paid office or apparent opportunity of employment were the ones Linnaeus was able to persuade to travel. In general it is these same students who were closest to him. The students also had their own good reasons to travel, for career, for assembling

collections, for fame or even vanity.

Conventional heroic historiography has made a special point of the good and national character of the students. They were basically loyal apostles who, at the end of the day, found themselves able to make the greatest sacrifice for their master, king and country. Or so it has been said – with one major exception, Daniel Solander, who deserted his mentor, stayed illoyally in England, did service for Banks and the British and never returned home to take up the chair at Uppsala that Linnaeus had secured for him – nor for that matter to take up the chair in St Petersburg that Linnaeus had also aimed for him, as a wise career step. Linnaeus was even prepared to accept Solander's relationship with his daughter Lisa Stina. "The ungrateful Solander", as Linnaeus called him, and as he has to a large extent gone down in nationalist historiography in Sweden – indeed it is only in Australia that a proper biography has been written, by Edward Duyker and published in 1998.<sup>13</sup>

This image of the apostles as loyal disciples ultimately comes from Linnaeus himself. It pays little attention to the outcome in individual cases. The course of events was considerably less controlled and predictable. In fact it is clear that the apostles had more doubts than Linnaeus would admit, and perhaps more than he knew. Johan Peter Falck, for example, who was sent to Petersburg, proved himself capable of great independence in his judgement of his teacher when the latter could not read his comments. When he was made responsible for the gardens in Petersburg in 1765 and appointed Professor of Medicine and Botany, his eight-year younger brother Anders who was studying at Uppsala at the time wrote: "How could I not be pleased to see the old man change colour? Now you can tell him to kiss your arse without thereby risking

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<sup>13</sup> Edward Duyker, *Nature's Argonaut: Daniel Solander 1733–1782*, 1998.

a farthing.”<sup>14</sup> Between themselves, the brothers described Linnaeus as “the old man” or “the old man at Svartbäcken”, the area of Uppsala where Linnaeus lived, and commented that they did not mind him turning green in the face; this was in remarkable contrast to the humble words that Falck used when addressing himself directly to Linnaeus.

Other examples can be found in correspondence between the apostles themselves. Prior to his expedition to Spain and America, Löfling wrote to his trusted friend Pehr Bierchén that he had, in point of fact, had little choice in the matter. His exceptionally close relationship with Linnaeus had, in practice, been the determining factor when deciding to go. Linnaeus also had considerable problems with his apostles when they were out in the field. Linnaeus pushed Kalm who then complained when he was asked to go further north in Québec. In the end, however, Kalm hesitated and did not go. Linnaeus was furious.

#### ‘The ungrateful Solander’

Linnaeus was often furious. Or simply sad, unable to understand why. He was the greatest genius that the country possessed and hailed everywhere – even at the Royal court where he served restlessly as keeper of the Queen’s collections and sometimes as her *amusement privé*. She liked him and his wit and his learning, which she understood, being the sister of King Frederic of Prussia and a correspondent of Voltaire.

But maybe the most lasting anger and disappointment was the one that Linnaeus felt towards Solander, this deceitful, disloyal student, sleeping with the enemy, or at least with the competitors in

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<sup>14</sup> Anders Falck to Johan Peter Falck 27 February 1765, in ‘Anders Falcks brev till Petersburg: Utgivna av Olle Bergquist’, *Lychnos* (1965-66).

London. Linnaeus wrote hosts of letters, but for six years Solander never answered.

Perhaps it was not very strange at all. When Solander arrived in London he quickly discovered that there was a market for his skills. He had served as Linnaeus's assistant in making tiresome catalogues of the natural history collections of minor Swedish noblemen. Here he was in London, in the summer of 1760, thrown into the honey pot of a global empire of collections, and soon best buddy, if not more, with Joseph Banks, a likeable, generous and likeminded friend and brother in arms of natural history, and seduced by a swirl of parties and public breakfasts and thrilling sensations of upper-circle intellectual conviviality.

Solander loved it, and he could compare it with Uppsala which he knew, a town of two thousand anxious souls compared to bustling million and a half in London. He could also figure out what it would be like to sit in Petersburg, "educating Russian bears", as Peter Collinson wrote in a letter trying to make sure that he could stay in England and make a career there, which he did, not just with Banks but also in the British Museum, where he was the ideal curator.

It was not really as a loyal Linnaean that Solander performed his work on board the *Endeavour*. On the contrary, it was as a young man who had been locked into the confines of a closet of rigid Lutheranism and paternalist professorialism – and who was finally free. Banks had a quite different style than Linnaeus as Principal Investigator. It was, should we say, more aristocratic. He allowed the travelling naturalist full rights to everything. He sought nothing for his own scientific career because he did not really wish to have any. He already had everything, so good company was what counted, and responsibility for empire, which he built systematically.

Their travels were of course not innocent. Sexual assault of South Seas women was common among Cook's men, although

Cook himself found it less pleasant. And repeatedly they entered into shooting incidents with local populations with several casualties; Solander is known to have opened fire on two occasions and might possibly have killed a Maori on the northern tip of the North Island.

After Solander's premature death from a stroke in 1782, Banks was devastated by the loss. His words of remembrance of his old friend are worth quoting, as evidence of what a life in creative freedom and mutual sympathy can mean for fulfilment:

During this voyage [with Cook], which lasted three years, I can say of him that he combined an incomparable diligence and an acumen that left nothing unsettled, with an unbelievable equanimity. During all that time we did not once have any altercation which for a moment became heated. We often freely contested each other's opinions in all subjects, but always ended as we had begun, good-humouredly and generally being of the same opinion after one of us had accepted his opponent's reasons.<sup>15</sup>

This seems quite humane, does it not? Even enlightened. In a sense this is what it was all about – Solander met the Enlightenment in London and in travelling the world, and to Enlightenment Linnaeus did not belong, despite living in its very century, spanning it, just like a Voltaire, a Rousseau, or a Montesquieu.

The globalization, of sorts, that he advocated was not principally one of liberty, tolerance and equality of races, but the one that is today represented by the World Forum of Davos, or the pharmaceutical industry, roaming the tropical rain forests for genetic substances, or building national innovation systems with universities as corner stones. Linnaeus might have believed in superstition, and he

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<sup>15</sup> Joseph Banks quoted in Edward Duyker and Per Tingbrand (eds.), *Daniel Solander: Collected Correspondence 1753–1782*, 1995, p. 412.

was clearly not an Enlightenment philosopher. Yet his natural history travel enterprise put Sweden on a modernizing path, linking science and economy.

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