“Little Brother Carl” – the Making of a Linnaean Naturalist in Late Eighteenth Century Sweden
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Abstract:

“Little Brother Carl” was Carolus Linnaeus’ affectionate name for his best friend’s son, Carl Bäck. It is Carl Bäck’s natural history education and the network of friends and clients of Abraham Bäck (Carl’s father) engaged in the pedagogical project that forms the focal points in this article. The naturalists occupied in Bäck junior’s education taught him a combination of social and scientific skills. To be selective and informed in exchanges of natural history specimens was a central skill, which in turn demanded an intimate knowledge of one’s collection. Bäck junior also learned how to display this knowledge, including e.g. how to write catalogues corresponding with Linnaeus’ systems of classification. The combination of social skills and theory informed knowledge displaying techniques aimed at shaping Bäck’s scientific persona into that of a Linnaean naturalist and potential leader of Swedish naturalist scholars. The education of Carl Bäck contributed to the reproduction of this newly formed group in other ways too. The relationships between Abraham Bäck and his son’s teachers illustrates how private education promoted both friendships and patron-client relationships between different generations of naturalists, something that contributed towards the extension and strengthening of the naturalist community in Sweden (a community Linnaeus had laid the foundation to in his work educating several hundreds of students in Uppsala from the mid-eighteenth century and on onwards). In this respect this article also demonstrates the need for a bifocal approach to science pedagogy, taking into account the interplay between private and public education in the early modern period.
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What can the history of education teach us? In recent years, science pedagogy has become prominent. It promises to contribute to the “big picture”, as Kathryn Olesko puts it, wherein science pedagogy is “central to understanding the contours of scientific practice, the formation of scientific personae, and indeed the ability of science as an enterprise to reproduce and survive.”

In this article I test the explanatory power of science pedagogy in relation to natural history in late eighteenth century Sweden. This period included the final decades in the life of Carolus Linnaeus (1707–1778), one of the most prominent naturalists of the time. Linnaeus spent a large part of his adult life at the University of Uppsala, where he taught several generations of students. In the traditional historiography of Swedish science, the period in which Linnaeus was active constituted a golden era, not only in virtue of his work reforming and diffusing natural history, but also because of the way the subject became prominent in the political, economic and intellectual life in Sweden. In this respect, the final decades of the eighteenth century and the first of the nineteenth represents a decline. Natural history lost its fashionable status during this time, as art and literature moved to the forefront, and (outside of chemistry) scientific intellectual achievements and innovations were rare.

At the end of the article I shall return (briefly) to the early nineteenth century and consider whether my analysis suggests a new way to explore this development, or (to borrow from Olesko) I will look at the ability of natural history “as an enterprise to reproduce and survive” in Sweden. This discussion will follow an analysis of ways in which junior and senior naturalists became involved in teaching natural history in the 1770s, and in which friendships and patron-client relationships shaped both these pedagogical activities and (relatedly) the recruitment of new members to the naturalist community. My analysis will also illuminate the reproduction of social practices central to Linnaean natural history, and building on that, I shall discuss the making of a Linnaean naturalist as a “scientific persona”.

Borrowing from H. Otto Sibum and Lorrain Daston’s definition, a scientific persona is a “cultural identity”, on which individuals with widely differing professions and social statuses can model themselves. It is protean: as conditions change, old scientific personae are replaced by new ones; and as an analytical category it belongs between the “individual biography” and the “social institution”. It deserves mention that the term “scientific persona” has been defined to facilitate an analysis of a heterogeneous range of individuals who contributed in different ways to intellectual developments from the early modern period onwards. In contrast to this tradition, that of science pedagogy has focussed almost exclusively on modern scientific developments – i.e, processes which took place in the nineteenth and twentieth centuries. This corresponds to a rather limited conception of science, as involving the changing role of research in defining new disciplines, reforms of academic structures, and the rise of professional scientists. While I do not in this paper attempt to defend a historically more inclusive conception of science, I intend my discussion of science pedagogy in the late eighteenth century to raise questions relevant to those interested not only in early modern natural history but also in the “birth” of modern sciences.
Bifocal focus on early modern education

One explanation for the relatively few existing attempts to discuss the pedagogy of natural history in the early modern period might have to do with the changing definition of the term *amateur*. Today the word amateur implies the existence of professionals. While education is pivotal to the professional’s identity and legitimacy, the lack of formal education is one important characteristic of a contemporary amateur. The early modern conception of an amateur was however neither shaped by the existence of a professional group nor by the lack of education *per se*. As the etymology of the term “amateur” and other closely related ones (e.g. “lieberhaber” and “dilettante”) suggest, love and passion (for a subject) and pleasure (associated with exploring it) was the defining feature of this identity. It was not shaped in opposition to those (relatively few) who were responsible for e.g. teaching natural history or curating collections on behalf of institutions or patrons. Moreover, the role of learning varied; as Steven Shapin has pointed in relation to natural philosophy in seventeenth century England, too much education threatened to turn gentlemen scholars into “pedants”. However, such fears did not render education superfluous; rather what a gentleman needed to learn was among other things how to display knowledge in the correct way in e.g. conversations with others. The social context that shaped the conduct of and relationship between naturalists in the eighteenth century was the Republic of Letters – a community of men (and some women) who corresponded with one another across regional and national borders. And it is against the backdrop of the Republic of Letters as the main social context, and with the early modern notion of the *amateur* as a reference point that I suggest we think about the central topic of this paper: the education of Linnaean naturalists. I propose to tackle this topic in a way which integrates two distinct approaches; one which draws on a relatively rich history of education and one which is much less well researched.

The first tradition is concerned with public education. The fact that transnational communication between members of the Republic of Letters was frequently conducted in Latin suggests a relatively high level of education (and social standing). Although the details vary from one country to another this would in many cases have included a university degree. Some, though by some margin not all members of the Republic, had even studied natural history as part of their degree. The subject was taught mainly in the medical faculties in early modern European universities. Natural history was also taught in lower level schools, although the provision was patchy, and varied from region to region.

In this respect, the provision of natural history teaching in higher and lower education in Sweden followed a European pattern. The teaching of natural history in Swedish “gymnasium”, secondary schools located in centre of dioceses of Sweden, can be traced back to the mid seventeenth century. This teaching was further extended in the eighteenth century – a trend that was tied to several different developments, including the extension of medical care provision, particularly the establishment of new district physicians’ positions. These were in some cases expected to instruct the students of local gymnasiums in natural history, though they were often prevented from doing so by their heavy medical work-loads, something which also explains the drive behind other attempts to secure natural history on the gymnasium curriculum (including the creation of a special natural history lectureship). More generally, these reform
plans reflect the influence of Mercantilism and Cameralism on the policies of the “Hat Party”, one of the two dominant political parties during Sweden’s Age of Liberty (1718–1772). Natural history was promoted as central to making the country more self-sufficient hence the support for the wider diffusion of relevant knowledge – it was part of a grander scheme to utilise nature more efficiently. The campaign to reform the curriculum lost its momentum towards the end of the century. Voices critical of the economic and political doctrines that underpinned natural history grew louder and more influential, and natural history lost its fashionable status among the Swedish elite, particularly in the wake of the regime change and the return to absolutism in the 1770s. Only in the second half of the nineteenth century did natural history (and then at the beginning of the twentieth, biology) gain a secure place in the reformed secondary school system (“läroverken”).

The central initiative and political debates apart, it is clear that the provision of natural history teaching depended very much on local circumstances and individual initiatives. Some of the Swedish gymnasiums, e.g. Skara, Strängnäs and Växsjö (where Linnaeus received his early education) had a long and successful tradition of teaching the subject. However, the most important centre for natural history in the eighteenth century was the University of Uppsala, or more precisely its medical faculty, where Linnaeus had been professor since 1741. Today Linnaeus is best known for his reforms of scientific nomenclature. His system of binary names replaced the old diagnostic nomenclature – the tradition of using a description of a species as a name. Diagnostic names were generally long and hard to remember; moreover, as new species were discovered they often had to be modified. Linnaeus’ new nomenclature was much more stable: every species received two fixed names, a generic name which indentified the family to which it belonged, and a specific epithet which served to distinguish it from other members of the genus. There is a pedagogical explanation of this reform. As William Stearn and Lisbet Koerner (Rausin) have argued, Linnaeus developed the system partly in response to watching his students struggle with the diagnostic names while working on the field. Linnaeus’ “sexual system” (an earlier innovation) was also intended to make natural history more accessible. It was designed to simplify the identification of plant species using a system of keys, the most important being the number and position of stamens and pistils.

The sexual system helped to promote autodidact studies of natural history in the second half of the eighteenth century across Europe, particularly, perhaps, amongst women, who as a rule were excluded from public education (this notwithstanding the popular perception of Linnaeus’ sexual metaphors as unsuitable for the “weaker sex”). Back in Uppsala, Linnaeus also helped his students to acquire more tacit knowledge, e.g. involving the observation of nature outdoors, on the regular excursions that he organized. Elsewhere I have argued that Linnaeus’ use of the meadows and forests around Uppsala as classrooms also served to make natural history more socially inclusive. The outdoors offered opportunities for ambitious students to train their observational skills without incurring the costs traditionally associated with advanced studies of natural history, as these exercises did not require expensive equipment or large libraries. Linnaeus also helped his best students: he utilized his expansive network to give several of them opportunities to travel further afield. As Kenneth Nyberg and I have argued elsewhere, such journeys functioned as a form of graduation and returning survivors were often rewarded with attractive salaried positions within the university, church or medical organizations.
The success of Linnaeus as a teacher, a pedagog, is evinced by the number of students he attracted, particularly to the excursions around Uppsala where several hundred could march together, accompanied by drums, horns and shouts. To a certain extent, Linnaeus’ leadership followed the pattern identified by Jerome Ravetz in which a successful leader of a new (or in this case, reformed) discipline acts in order to attract followers. According to different estimations, Linnaeus taught between 273 and 457 Swedish students. The importance of Linnaeus’ role as a teacher becomes even more conspicuous if we include the students of his students, i.e. the many who were taught natural history by instructors educated by Linnaeus. Positions as professors, adjuncts and lecturers in natural history, medicine, economy and chemistry at universities and gymnasiums around Sweden (and elsewhere) where dominated by his students; and at the turn of the century, two thirds of the members of the Royal Swedish Society of Science had studied under Linnaeus.

Against this background the link between the pedagogy and teaching of Linnaean natural history and the survival of natural history seems quite straightforward. We can visualize it as an educational family tree, with Linnaeus as the ancestor, the stem, and subsequent generations of students as the branches. There is, however, a problem with this analysis. By focusing exclusively on formal professor/teacher-student relationships, it automatically and exclusively locates the transfer of knowledge in public educational institutions. Moreover, it tends to limit the discussion of what was transferred to types of knowledge that were on the official curriculums. Learning processes taking place elsewhere and lessons about other things are excluded per se. Moreover, the model seems peculiarly modern or ahistorical: it does not tell us anything about circumstances specific to the early modern period. In order to understand the role played by pedagogy and education in a broader and less anachronistic way we need, I argue, a complementary history of science pedagogy.

One reason for pursuing such an approach can be found in discussions of the role of trust in the making of knowledge. As Steven Shapin discusses in his A Social History of Truth in relation to developments in natural philosophy in seventeenth century England, descriptions of experiments e.g. were accepted as true and circulated among individuals because these individuals trusted each other. Such trust was rooted in an early modern notion of honour and a gentlemen’s identity and was further consolidated in face-to-face discussions and extended in networks and through correspondence. Ultimately this trust helped to establish ways in which intellectual disputes could be resolved and new questions raised. One marker of the modern scientific world, in contrast, is a different form of trust, directed towards institutions (such as universities) rather than individuals. It is this “system trust” that gives scientists employed by these institutions the status of truth-speakers today.

It is against this backdrop that I suggest it becomes particularly interesting to analyze an alternative history of Linnaean pedagogy and education. We can say that by reforming natural history, Linnaeus contributed to the shift towards system trust and ultimately the coming of modern science. His reforms not only made it easier for natural history to be learned at gymnasiums and universities, and even to a certain extent with the help of autodidact studies; something which also contributed to the popularisation and consumption of natural history that characterized the eighteenth century and onwards. Linnaeus’ reforms also made the production of natural history easier: communication between producers of natural history within the Republic of Letters was improved as a result of the new nomenclature. This was particularly true
of Britain, were Linnaeus became very popular, and where his collections ended up after his death. The growing importance of great collections marks a general change in how natural history was becoming organised. As Alix Cooper has argued in *Inventing the Indigenous*, Linnaeus’ reforms benefitted naturalists in the centre with access to great collections, while “local experts” became marginalized in the process.25

Even if we take into account the greater consumption and production of natural history and the beginning of a centralisation of natural history material, this does not mean that we should apply the modern distinction between amateurs and professionals to this time in history – i.e. the second half of the eighteenth century. The research-driven specialization, the institutionalisation and professionalization of natural history had not yet happened: natural history had not detached from medicine and the foundation and institutionalisation of independent disciplines such as systematic botany, zoology, entomology and ultimately biology were still decades away. Moreover, and independently, whether or not an eighteenth century naturalist had been educated by Linnaeus, he still needed to be trusted and acknowledged by fellow naturalists in order to be able to contribute to their discussions of the natural world. This means that this naturalist needed to know the social codes that dictated how relationships were formed and maintained between the lovers of nature – the early modern amateurs who formed parts of the Republic of Letters. These codes were by all accounts complex and difficult to negotiate (I shall return to them below).

My aim in this article is to present a history of pedagogy and education that places the modernisation process to which Linnaeus’ reforms and teaching contributed in the social context of early modern natural history. While the official curriculums and the histories of teaching natural history at universities and gymnasiums is a (significant) part of this history, we also need a history of the learning of the social codes which promoted trust and of the formation of a naturalist persona who could navigate the social context of the time. As I shall try to demonstrate below, not only can such a twin analysis help us to understand the ability of natural history to reproduce, it might also enrich our understanding of the change from early modern to modern science.

I suggest we begin this second history of education in the households of the naturalists. As Alix Cooper has observed, the homes of early modern scholars – e.g. their kitchens, studies, attics and gardens – have generally been overlooked in the history of early modern science, which has instead typically focused on botanical gardens, laboratories and museums, as places where knowledge was produced and reproduced. Not only were households important spaces for experimentation and observation, their organisation, the interpersonal relationships and the ideological foundation on which they rested, also shaped this production. A household was a hierarchy of personal relationships and its master could conscript not only his servants, but also his children and wife, in projects exploring the natural world. Embedded here is also a history of education. Cooper touches on this when she discusses how collections were extended and research projects carried on over decades and within the same family. She compares this to the way in which trade knowledge and guild membership were inherited over generations within families.26

Cooper’s understanding of households as sites where knowledge was transferred and collections and networks were passed on between generations within the same family touches on several aspects of my discussion below. However, this approach must be complemented in one
respect if it is to contribute to my history of learning. We need to pay further attention to the
flexibility of the early modern household, the circulation of individuals between them, and the
diffusion of knowledge this promoted. A good example is highlighted by Ylva Hasselberg: the
tradition of members of social elites to send their children to live with other members of the
same elites. One intention behind such visits was that the child would form relationships with
people likely to benefit him or her in the future: another was that the child would learn to behave
in ways that invited the trust of other members of the elite community. Another group of
people that circulated between households, particularly in the early modern period, was that
labelled “life cycle servants” by Sheila McIsaac Cooper. The emphasis on “life-cycle” is
important: it involves (often young) individuals who worked and lived in a household other than
the one in which they were born, for a short period (typically between childhood and marriage
and formation of their own household). In contrast to “life-time servants” these individuals’
positions were temporary and did not signify a diminished status. The circulation of individuals
between households can be seen as part of both an educational and a social process. As McIsaac
Cooper puts it, it was part of “a form of social exchange, life-cycle service that helped cement
social ties […] reinvigorated alliances […] and strengthened patron/client relationships.”

Insofar as historical studies have taken into account this circulation of knowledge and
individuals between households, it has generally been in the context if the rather fragmented and
marginal history of private education. One possible reason why this subject matter has received
relatively little attention is that it tends to be discussed as an appendix to the histories of
aristocracies and costly grand tours. However, from the point of view of eighteenth century
Sweden there are two interconnected problems with this association. First of all, as one of the
few studies of the topic in Swedish (by Magnus von Platen) demonstrates, private education was
not exclusive to the aristocracy. Rather, it was a widely used system among a rather large section
of society: to employ a private tutor was common practice among well-to-do farmers and
middle-ranking clergymen. One indication of the system’s extent can be found in the statistics
involving students who had matriculated but were absent from their university studies. von
Platen estimates that between half and one-third of all Swedish students in the eighteenth century
were on leave, most of them in order to teach privately.

Moreover, private education was closely linked to the system of public teaching. In
schools older students taught or “informed” younger ones – a responsibility that often also
included the organization of food and lodging. Similar services were also provided by lecturers
and professors who often taught publically and also privately, to students who paid extra,
sometimes as part of a package which included accommodation and meals in the lecturer’s own
home. The salaries of lecturers and professors were often meagre, and this offered a welcome
supplement. Senior students who took up assignments as private tutors and assisting teachers to
junior students needed the work to finance their own studies. Compared to their continental
equivalents, Swedish students tended to come from more modest social backgrounds: in the
eighteenth century, as many as one-fifth of Uppsala university’s students were farmers’ sons.
In sum, private and public teaching were closely connected activities, which reflected the relative
ease of access to higher education that poorer Swedish students enjoyed at the time.

But even if, by all accounts, private education played a central role allowing
particularly poorer students the opportunity to fund their education, it is nonetheless a largely
unexplored aspect of Swedish educational history. The main reason for this is of course that the
system is hard to comprehend: we lack systematically archived material relating to it. This is also the chief reason why in the discussion below, I shall concentrate on a single case, the natural history education of Carl Bäck (1761–1776). As I shall demonstrate, although Bäck’s education took place mainly away from gymnasiums and universities, only an approach that integrates the histories of public and private education can provide a satisfactory analysis of how and by whom his scientific persona was shaped. It is also an example that brings us to the heart of the issue of how Linnaean natural history survived and was reproduced.

Little brother Carl – the case study

Carl Bäck’s education is a good case study for three reasons. First, a wide range of instructive historical documents have survived. Particularly important is material from the three longer journeys that Bäck undertook between 1774 and 1776, aged between fourteen and sixteen years. The first of Bäck’s journeys, in the summer of 1774, was to the south of Sweden (including a short visit to Copenhagen). It is documented in an extensive travel journal written by Bäck’s tutor Daniel Lindwall (1743–1796).³⁴ On his two subsequent journeys, Bäck was accompanied by Sven Anders Hedin (1750–1821) who also kept diaries (though not as fastidiously). The first of these trips, in the summer of 1775, brought Bäck to Härnösand, more than 400 kilometres north of Bäck’s home in Stockholm. The second journey with Hedin took him in a westerly direction, to Gothenburg in late August and early September 1776.³⁵ Before these three longer journeys, aged ten, Bäck had also spent a month in Uppsala with his first tutor, Daniel Söderberg (1750–1781). This trip is also documented in a shorter diary written by Söderberg with some initial notes by Bäck.³⁶ Bäck’s trips are also discussed in number of letters written by naturalists who hosted Bäck and his travelling tutors.³⁷ This group included Linnaeus himself, and some of the most prominent members of the Swedish naturalist community (most of them former students of Linnaeus). Carl Bäck’s education is just one of many topics covered in correspondence between these naturalists and Carl’s father, Abraham Bäck (1713–1795).

Although today he is best known for his association with Linnaeus, Bäck senior was a significant figure in the Swedish scientific community. More than 500 letters from Linnaeus to Bäck pay witness to their friendship, a relationship strongly coloured by their mutual interest in natural history.³⁸ If Linnaeus’ herbarium was the biggest in Sweden, Bäck owned the second largest; a collection over which his son (to whom Linnaeus referred as “little brother Carl”) was expected one day to take control.³⁹ Thus, the context of Carl Bäck’s education was shaped by the presence of Linnaeus and his circle of friends and ex-students, and by the anticipation of his future role within the natural history world. The social codes that Bäck junior was taught and the ideal that directed the attempts to form his scientific persona are very likely to have conformed to contemporary norms. These circumstances provide the second reason to regard Bäck’s education as worthy of closer analysis. In the first section below I shall discuss how Bäck's education was dictated by these norms and how this illuminates the formation of a Linnaean scientific persona.

The third reason is that Carl Bäck was taught by several different instructors, including both senior and junior members of the naturalist community. In the second section below I shall discuss how the relationships that surrounded Bäck’s education shaped what and how he was taught. I shall also discuss how the relationships between Bäck senior and his son’s
instructors can inform an explanation of the ability of natural history “as an enterprise to reproduce and survive”.

**Lessons in sharing material and displaying knowledge**

Given his father’s interests, and the expectation that he would inherit the second largest herbarium in Sweden, it is not surprising that Carl Bäck spent a considerable amount of time learning natural history. As I have discussed elsewhere, the education that the young Bäck received, traversing Sweden in the mid 1770s provided him with a thorough introduction to the Swedish flora. Fields, forests, shores and ditches were used as outdoor classrooms by Hedin and Lindwall: here they taught Bäck to observe the landscape, and to examine and identify different species using Linnaean taxonomy and nomenclature. This theoretical and practical knowledge was however just one side of his education. Bäck needed also to learn how to behave as a naturalist, he needed to know the social codes associated with membership of the naturalists’ sphere of the Republic of Letters.

One of the defining features of the Republic was the exchange of immaterial and material stuff. Letters could carry news, information and recommendations very useful to the receiver. Letters were also often accompanied by objects such as plant material, minerals or (dead or alive) animals. It is tempting to say that the acts of giving and receiving were defining features of a general “scientific persona” in the early modern period. Indeed, ways in which these exchanges were conducted were themselves a complex business. Which object to send when initiating a new contact; what to offer in return for a gift, wanted or unwanted; how to deflect further gifts and terminate an exchange, or deflect an exchange to another direction – judging by the literature on the Republic of Letters, these were central questions which preoccupied its members at length. However, even if moral and political conflicts surrounding these exchanges have been discussed by historians, the learning of the principles for giving and receiving has been largely ignored. Insofar as they have been analysed from a more theoretical point of view, it is often in the light of anthropological studies. The work by the French anthropologist Marcel Mauss on the role of gifts in shaping relationships is perhaps the most significant study used to understand the exchange. The anthropological origin of the approach – the notion that we are dealing with a near-universal pattern of human behaviour – suggests that knowledge of the rules governing gift exchange is rooted in experiences of human interaction in general rather than in explicit instruction. However, the literature on the material and social culture of the Republic suggests that far from being implicit, such rules of conduct were in fact discussed extensively. A closer study of Carl Bäck’s education reveals not only how they could be taught but also how teaching them constituted a part of a more general attempt to shape Carl Bäck scientific persona into that of a Linnaean naturalist.

The example with which I shall begin is taken from Johan Lindwall’s diary from the summer of 1774. Lindwall was in charge of the travelling party although on this particular leg of the journey they were in the company of Daniel Söderberg, Bäck’s first tutor. Lindwall and Bäck had encountered Söderberg on their way back from Copenhagen and, now at the beginning of August, they were travelling together through Halland, a county in the south west of Sweden. This was the home region of two of Linnaeus’ more prominent ex-students: Pehr Osbeck (1723–
1805) dean of Hasslöf, and famous for his journey to China at the beginning of the 1750s; and the district physician of Halmstad, Lars Montin (1723–1785). It is the visit to Montin we shall consider first.

Notwithstanding his isolated position (Lund was the closest university) Montin was well-connected. He sponsored both Anders Sparrman, one of the Swedish naturalists on Cook’s second expedition, and Carl Petter Thunberg, Linnaeus’ successor in Uppsala, on their extensive journeys around the world. In return he received exotic material with which to complement his extensive collection of Swedish specimens. In his youth, Montin had travelled to Lapland to collect material; and he and Osbeck were working jointly on a natural history of their home county. All in all, this had produced a fine collection. In fact, Montin was competing with Abraham Bäck for the honour of owning the second-richest herbarium in Sweden. And it is in the context of examining a part of Montin’s collection that we find an example of how Bäck was taught the social etiquette of the budding naturalist – in particular, how to be selective and specific.

Today was studied the relics of duplicates in the herb collection of the Doctor [Montin], some of which we received, but Mr Söderberg most and since Mr Bäck did not know which herbs he owned the Doctor promised in the future, and after a Catalogue [from Bäck] had been forwarded, to send him everything that he has duplicates of. The quote suggests that the travelling party and Montin had been sitting down together with specimens from Montin’s plant collection which he had duplicates of, and with which he was prepared to part. Söderberg had profited most on this occasion; Lindwall too had received some, but Bäck only little or possibly none. The main reason for missing out was that Bäck did not know the content of his own collection and so could not inform Montin of which species he was missing. However, Montin promised to send Bäck specimens that would complement Bäck’s collection, when Bäck let him know what he had.

What Bäck is taught here is that in order to qualify for gifts in the form of duplicates from someone’s collection he needed to know the contents of his own collection. It suggests that a main principle when taking part in an exchange was that gifts were given away on the understanding that they would fill the gaps in the receiver’s collection. Montin was not alone in teaching Bäck this social code in this way; Linnaeus used the same pedagogy. In a letter from Linnaeus written in April 1774 (addressed to Abraham Bäck) Linnaeus encouraged his best friend’s son to find out what his collection contained so that he (Linnaeus) could further “multiply it”. The condition was however that Carl Bäck knew what he had. A few months later Linnaeus wrote again to Abraham Bäck on the same topic suggesting that Carl Bäck should write: “a catalogue of his plants so that he with having it close to hand could know what he owns and not”.

There is an additional skill that Linnaeus and Montin were encouraging Bäck to learn which ultimately involved the formation of Bäck’s scientific persona into that of a Linnaean naturalist. Central to this persona was the ability to display knowledge in the correct way, something which included knowing how to write a “catalogue” (note that both Montin and Linnaeus use this term). The encouragement Bäck received to keep a record of his collection can of course be seen as way to get Bäck to study more, to better remember the names of species. On
a more profound level though, it was about learning to demonstrate intimate knowledge of one’s own collection. The ability to display this knowledge was not only important when requesting duplicates from other naturalists’ collections, it cut to the heart of what it meant to be and behave as a Linnaean naturalist. Catalogue-writing was just one of several knowledge-displaying techniques that Bäck was encouraged to learn. On his journeys he visited a wide range of natural history collections, most of which were privately owned. These visits reveal the connection that was made between the organizations of a collection and someone’s status as a more or less respected member of the naturalist community.

The most important component in this was the extent to which the organisation of a collection reflected knowledge of Linnaean taxonomy. To the first camp belonged the vast majority of the naturalists visited, the most prominent, of course, being Linnaeus himself. His collection was obviously the norm – in 1769 Linnaeus had built a separate house for it next to his summer residence Hammarby, outside Uppsala. As Hedin wrote, following his and Bäck’s visit there in the beginning of June 1775:

We could here see the most splendid collections, gathered from all the kingdoms of nature [and] from all parts of the world, ordered in the most excellent order, following Sir Archiatern’s system.49

It was the vastness of the collection as well as how it was structured and displayed that evoked the admiration of the visitor. Moreover, Linnaeus took time to present it personally – a presentation that continued the next day, Whitsunday, “fulfilling” the visitor like the most “splendid sermon”.50 We can contrast this display with what Lindwall and Bäck got to see when they visited the dean of Walda och Släp, Gustaf Fredrik Hjortberg (1724–1776). Hjortberg, like Osbeck had travelled to China on behalf of the Swedish East India Company in the late 1740s and early 1750s, before he settled in north Halland. In Swedish literature on the eighteenth century, Hjortberg is often identified as a representative of the enlightened clergy; he was a traveller, a naturalist, a farmer and a physician, all in one.51 Frequently visited by curious travellers, Hjortberg used his home, garden and collection – which included live animals as well specimens collected on his journeys, electronic instruments, artwork, etc. – to display the broadness of his interest and his talents. However, Lindwall’s first comment was on his poor display of natural history knowledge: “he showed us some Swedish insects without order and a few stones also without orderliness.”52

Lindwall did not need to spell it out; lack of “order” and “orderliness” equalled the absence of Linnaean organizing principles and knowledge about them. Among the naturalists that Bäck visited, Hjortberg also belonged to a minority who had not been taught by Linnaeus – though he had learned a little by reading Linnaeus (with whom he also corresponded occasionally). Hjortberg’s reputation seemed (among other things) instead have been based on what he had collected on route to China (and what he bought from other travellers returning from Asia). In Lindwall’s eyes, he was an archaic type of eclectic collector rather than a “modern” Linnaean naturalist.53 In this respect Hjortberg’s collection was a negative example, and what Bäck should have learned from the visit was the importance of using Linnaeus’ taxonomy as the organizing principle when displaying a collection.
Knowledge of the principles of Linnaean taxonomy did now preclude one from being innovative and developing new display techniques, as the travellers’ visit to Pehr Osbeck demonstrates. Bäck and his companions spent a few days in the rectory, studying plants in Osbeck’s garden and being taken on excursions. But the travellers also spent a considerable time studying Osbeck’s collections: Lindwall mentions Osbeck’s rich insect collection, his herbarium and, most significantly here, his collection of duplicates of dried pressed plants. The fact that Lindwall commented on its organization suggests that it was rather a novel system. Osbeck used an organizing principle very closely based on Linnaeus work in order to keep his duplicates of dried plants in order. They were kept in a “big book”, which according to Lindwall had as many pages as there was plants listed in the “Flora” and “the plant’s number in the Flora corresponded with the page number of the book.” The “Flora” that Lindwall refers to here is probably Linnaeus’ *Flora Svecica* (first edition published 1745). It had become the standard work on the Swedish plant world. *Flora Svecica* is made up of a list of names and descriptions; the order of which corresponds to the plants’ place in the *Sexual system*. Corresponding to each name there is also a number, and it seems that it was this number that Osbeck used as his organizing principle when sorting his duplicates. Osbeck’s “big book” was paginated and his plant duplicates were stored on the page numbers (or perhaps rather, book opening) which corresponded with their “species numbers” in *Flora Svecica*.

Osbeck’s knowledge-displaying technique – his “big book” – not only helped him to demonstrate his mastery of Linnaean taxonomy and ultimately his true scientific persona – his identity as a Linnaean naturalist. It was also likely to have promoted exchange within this group by creating a transparent system. Passing naturalists (senior and junior) such as Lindwall, Söderberg and Bäck (as Fritz Stenström has discussed, Osbeck and Montin were frequently visited by naturalists en route) could browse Osbeck’s book and easily identify which specimens he had plenty of and was prepared to part with. A catalogue such as the one that Bäck was encouraged to write of his own collection promised to play the same role. It facilitated the exchange of material between naturalists who knew how to read it, i.e. Linnaean naturalists.

**Parents and teachers – patronage and friendship**

As well as his private tutors, Bäck’s education came to engage other individuals, some of whom have been discussed above. Linnaeus is of course the best known. I have also mentioned Osbeck and Montin. Their roles will be discussed in more detail below, together with those of four others who hosted Carl Bäck: Johan Otto Hagström (1716–1792), Peter Hernquist (1726–1808), Carl Magnus Blom (1737–1815) and Johan Jacob Ferber (1743–1790). They were not the only naturalists whom Bäck encountered on his journeys but it is in their letters to his father that we can find the most information relating to the young Bäck’s education as a naturalist. This is not a coincidence: Abraham Bäck’s relationship with Linnaeus, Osbeck, Montin, Hagström, Hernquist, Blom and Ferber was longstanding, and had been initiated by their joint interest in natural history. Indeed, the individuals in focus in this section constituted some of the most active naturalists in late eighteenth century Sweden.

This interest had one source: Linnaeus. Osbeck, Montin, Hagström, Hernquist, Blom and Ferber had all studied in Uppsala. Hagström belonged to Linnaeus’ first generation of students; he matriculated in 1737 and graduated in 1749, roughly when Montin and Osbeck
arrived to Uppsala. Hernquist, Blom and Ferber arrived in the 1750s and early 1760s. Ferber, the youngest of the hosts, finished his studies in 1763. In that respect, he was contemporary with the oldest of Bäck’s tutors, Lindwall, who matriculated in 1761, though Lindwall’s studies only really began in the late 1760s, by which time Söderberg and later Hedin (who graduated in 1775, as one of Linnaeus’ last students) had also started. The link between the pedagogy that informed Linnaean taxonomy and nomenclature, and the ability of natural history to survive and reproduce is manifest in this educational family tree spanning students who arrived in Uppsala over five decades. However, as I pointed out earlier, the history of natural history education in Uppsala is just one part of the story; the case of Carl Bäck provides an important complementing one. In contrast to the history of public and institutionalised teaching, with its focus on the teacher-student relationships; the focal point in this alternative history is the teacher-parent relationship. Below I shall discuss how it shaped not only the curriculum and the pedagogy, but ultimately also the ability of natural history to reproduce and survive.

I will discuss two kinds of parent-teacher relationships, first a patron-client relationship and second, a network relationship. By patron–client relationships I understand relationships in which power is distributed asymmetrically, an arrangement formed and sustained through exchanges in which clients receive support and protection from patrons. What the latter obtains in return varies but patronage typically produces loyal subordinates and ultimately status for the patron. The significance of patron-client relationships in the history of science is clear from a wide range of studies, covering histories of different periods, places and persons. Patron-client relationships have also been discussed in studies of the relationship between students and teachers. Professors have typically not only played the role of teacher to their students: as prominent members of a scientific community they have also been able to offer their students support and protection more generally. A similar dynamic can also be found within the context of private education, where e.g. the father of a student becomes the patron of his child’s teacher, providing the latter with a platform on which to build his future career.

It is against this backdrop that I suggest we look closer at the relationship between Hedin, Lindwall and Söderberg on the one hand, and Bäck senior and Linnaeus on the other. A letter from Linnaeus to Bäck senior, written in 1769 and responding to requests for assistance finding a tutor for Carl Bäck, is a good starting point.

My dear Brother, you want a tutor for little brother Baeck, who shall have the following properties: meek, not too young, with dona informandi [a gift for teaching], used to teaching, decent, reliable, [someone who knows] something about Botany, in natural history, about insects, conchilier [shells], French, Geography, History, good style, medicinae studiosus”.

Linnaeus thought this a tall order, but he had a candidate who ticked most boxes – Söderberg. The main problem was that Söderberg harboured plans to become a clergyman. Moreover, his French was somewhat weak, and his knowledge of shells non-existent (though Linnaeus planned to spend Easter Weekend teaching “it” to him). However, in all other respects Söderberg fitted the bill. When in subsequent years, Bäck sought replacements for Söderberg, he requested candidates with more or less the same qualities – or at least this is what Linnaeus’ responses suggest. The latter’s letters contain grumbles about how hard it was to find someone “steady”
and decent” who also knew enough about “insects and plants”. What, then, do Abraham Bäck’s requests for a trustworthy student with medical knowledge, and who also mastered natural history, tell us about Bäck’s anticipation – about how was he going to relate to the tutor? Moreover, how can this information help us to understand how and what the tutors taught Bäck junior?

First of all, the request for someone with medical knowledge can be understood from two points of view. On one level it reflected a father’s concern for his child’s health: Carl Bäck’s tuberculosis seems to have necessitated a travel companion with medical knowledge. On another level we can also read the request for a medical student as a reflection of Bäck’s ambition to form a patron-client relationship with his sons’ tutors. And this was a relationship the tutors were likely to welcome: as President of the Swedish College of Physicians, Abraham Bäck supervised the provision of medical care in Sweden. As medical students, Lindwall, Hedin and Söderberg (who took Linnaeus’ advice and abandoned his clerical ambitions) could scarcely have asked for a more potentially influential patron. Unsurprisingly, their responses to the offers to tutor Carl Bäck were very positive.

It also seems clear that the tutors’ association with Bäck promoted their careers. Hedin is the best example here, Abraham Bäck not only paid for his graduation; he also helped to establish Hedin as a doctor to the social elite in Stockholm: Hedin rose to the rank of Royal Physician-in-ordinary. Lindwall was appointed district physician in the county of Blekinge, a position he took up immediately after returning from his journey with Bäck in 1774. Söderberg ended up as town physician (stadsphysicus) in Eskilstuna, following a few more years of study. Given Bäck position in charge of the Swedish College of Physicians, a body that ranked and recommended candidates for medical positions, it is likely that Bäck exercised influence over Lindwall and Söderberg’s first promotions, although it is hard to judge the full effect of their contact with Bäck, since they both died young.

The advantage was not only with the tutors or clients. From Bäck’s point of view the employment of private teachers and future clients offered an opportunity to recruit individuals whom he could later use to his advantage. At any rate, that was how Linnaeus argued: in a letter to Bäck, Linnaeus’ advice (on how to treat Söderberg) was to, “Handle him like I know my Brother does and you will find him bendable as wax.” Three months later Linnaeus returned to the same topic:

With me he was decent and malleable as wax; I shall hope he remains so with my Dear Brother, if my Brother wants to form him according to his own liking.

The emphasis on Söderberg being “decent” relates to issues of reliability and ultimately trust. This was obviously central, as Linnaeus addressed the issue specifically in a letter to Bäck following the one in which he suggested Söderberg as a candidate for the first time. After acknowledging that Bäck’s need to be careful “when he leaves two young people, a young man and a girl, alone [in the hands of a tutor],” Linnaeus continued, reassuringly, that Bäck should not worry: Söderberg was “balanced and not too young.” He was, Linnaeus ended the discussion, “probit et modestus [honest and modest].” If he, (Linnaeus) was looking for a tutor, Söderberg would be his own choice, Linnaeus reassured Bäck.
In sum, Söderberg’s character was apt for the job, and moreover, he was “malleable”. He was made of the right stuff, and under Bäck’s influence he could be shaped in accordance with Bäck’s “liking”. What exactly is implied by “liking” is hard to say, but the principle characteristic expected from a patron of his clients was *loyalty*. Hedin, being most successfull of Bäck’s clients, was possibly the most useful in this respect. What Lindwall and Söderberg could have done to demonstrate their allegiance to Bäck senior we can only guess; but from Bäck’s point of view, as the head of medical services in Sweden, it must have been very advantageous to be able to rely on the loyalty of as many individuals as possible; particularly when called to intervene in the frequent conflicts that arose between physicians competing over patients, salaries and status.73

Having outlined the patron-client relationship between Abraham Bäck and his son’s teachers, we can ask how it informed the latters’ teaching of Carl Bäck? The request for individuals able to teach natural history obviously reflected Abraham Bäck’s ambitions for his son, as the heir to his collection. However, from the point of view of Söderberg, Hedin and Lindwall, this teaching assignment provided an opportunity to prove themselves as suitable clients to Abraham Bäck. I suggest that this also coloured how they taught Carl Bäck. What stands out most in the travel journals is the frequency and intensity of the teaching they conducted. Hardly a day went by without a mention of natural history lessons. Lindwall even complained the odd day when the paucity of variation in the landscape precluded the teaching of anything new.74 Their diaries (which ended up in Abraham Bäck’s archive) can be read not only as travel journals but as memoranda, confirming that the tutors had fulfilled their duties.

Moreover, the tutors’ mastery of natural history was important not only in regard to the education of Carl Bäck. This knowledge could also be used to impress Abraham Bäck in other ways which touched both on Bäck senior’s medical interest and his more general interest in natural history. Natural history knowledge played a role in Bäck’s work within medicine – of particular importance here is perhaps his work on a new pharmacopeia. Furthermore, Bäck was an active promoter of early modern “science” – e.g. he was one of the most frequent attendees of meetings of the Royal Swedish Academy of Science.75 These circumstances are also worth keeping in mind when we think about ways in which Carl Bäck’s tutors could improve their status as clients. For example, while travelling with Carl Bäck, Lindwall spent three days studying several thousands of samples of *Thesium alpinum* to determine its position in the sexual system; thereby demonstrating his commitment and skill as a naturalist.76 Likewise, Hedin sampled and experimented with water from different wells that he and Bäck junior passed along their way.77 As I have discussed elsewhere, for a Linnaean traveller, to utilise the landscape both for teaching and exploration was common practice. Understood against the backdrop of a patron-client relationship between the tutor and the father of his travel companion, the motivation for these actions can be interpreted as ways to impress the student’s father.78 In consequence, Carl Bäck learned (or at least had the potential to learn) not only the basic taxonomic methods and the new nomenclature, but also more advanced techniques for exploring nature, such as how to conduct mass observations and chemical experiments. In other words, the ways in which Carl Bäck was taught – the intensity and transfer of specialised knowledge – reflected his teachers’ relationships with his father.

The expectation that teachers of Carl Bäck would develop as naturalists is evident in other ways. For example, Bäck senior recommended Lindwall and Söderberg to the Royal
Swedish Academy of Science, as apprentices (ämnessvenner). Among other things, this allowed them to attend meetings of the Academy. Spending time in the Bäck family home also gave the tutors access to Abraham Bäck’s collections and library – a perk which Lindwall in particular explicitly mentioned. The fact that Söderberg wrote a thesis on the natural history of Rydby, the Bäck family’s summer residence, pays further witness to the way his pedagogic assignment facilitated more advanced pursuits of natural history. This arrangement was not unique. We can detect a similar pressure on other tutors not only to teach but also to learn and progress elsewhere. E.g. Linnaeus employed some of his most prominent students to teach his son, Carolus Linnaeus the younger (1741–1783) at home. This position was held by Daniel Rolander (1725–1793), Johan Peter Falck (1732–1774) and Pehr Löfling (1729–1756), all members of the group of Linnaean students often identified as Linnaeus’ “disciples”. While teaching the young Linnaeus they were simultaneously advancing their knowledge of natural history and assisting Linnaeus the older. Löfling’s experience is the best known: while tutoring Linnaeus junior he was also working on his own thesis and assisting Linnaeus in his work on Philosophica Botanica. According to Linnaeus, he worked hard: he was “in the garden, early in the morning and late at night, and at meal times he never left an opportunity to remember flora with his intelligent questions and doubts.”

Löfling seems in many respects to have been one of Linnaeus’ favourite students: his situation may have reminded Linnaeus of his own youth. As a promising student he had been assigned to teach the sons of Professor Olof Rudbeck the younger (1660–1740) in Uppsala, a position Linnaeus had himself occupied while pursuing his own research. These examples also illustrate the extent to which the position of tutor belongs to the category “life cycle servants” – i.e. a temporary position which was subservient, but which did not necessarily imply any diminution of future status. Moreover, as the examples above suggest, it was a position associated both with teaching and learning, and learning not only of advanced natural history, but also of how to behave as naturalist. A good example involves the art of appearing curious: Löfling’s advice to his good friend and fellow student Pehr Bierchén (1731–1774) was never to meet Linnaeus without having prepared a good question to ask him.

As powerful patrons in charge of households dominated by natural history, Linnaeus and Bäck offered relatively special environments and opportunities to tutors. However, as Linnaeus’ correspondence demonstrates, the role he played in matching parents’ needs for tutors with the needs of his students to find suitable positions tutoring natural history was far from unique. It was, as von Platen has discussed, common for lecturers and professors at gymnasiurns and universities to put students in contact with families seeking private tutors. Although it is outside the remit of this article to discuss Linnaeus’ role as a match-maker more extensively, what I have found suggests that the widespread system of private education and the opportunities it afforded to form patron-client relationships, is likely to have increased the attractiveness of natural history as a subject to study.

It is even credible, at least prima facie, that private education helped to “stabilize” Linnaean natural history in the middle of the eighteenth century. First of all, as I have discussed elsewhere, Bäck’s tutors used the outdoors as a classroom, in much the same way as Linnaeus did on his excursions, thereby promoting the same types of knowledge and skills. Secondly, the fashionable status of natural history should have increased the number of positions as private tutors among the wealthy and the powerful (i.e. those who could be most beneficial as patrons).
Put like that one can say that private teaching assignments helped to establish Linnaean natural history in something like the way in which, in the nineteenth century, the establishment of new teaching positions in the newly-evolved scientific sub-disciplines supported and stabilized the process of scientific specialisation. 89

Of course, in contrast to teaching positions in public institutions, private assignments were vulnerable to changing fashions (and as we know, natural history fell out fashion towards the end of the eighteenth century). There is however a way in which the private teaching of natural history can be seen to have contributed to the creation of a longer-lasting reproduction structure. Again the focus here is on parent-teacher bonds, but this time of a type categorised as network relationships. Drawing on work of Ylva Hasselberg, Leos Müller and Niklas Stenlås in particular, and of Pierre Bourdieu more generally, we can say that the main difference between patron-client relationships and network relationships involves the absence in the latter of hierarchical structure. Network relationships are “voluntary” and “non-formalised” and are often the results of contacts over a prolonged period of time. They feed on “mutuality” and “trust”. 90

Among the parent-teacher relationships that surrounded Bäck’s education it is that between Linnaeus and Bäck that best fits this description. Bäck and Linnaeus had a lot in common; as a professor in medicine Linnaeus educated many of the physicians who came to fill the positions of the expanding medical service supervised by Bäck. 91 Bäck also took great interest in those of Linnaeus’ students who travelled long distances, the “disciples”. Bäck provided several members of this group (of twenty or so students) with financial support. In return he received exotic material for his great collections. 92 However, in contrast to Linnaeus’ collection Bäck’s has largely vanished: only fragments of it survive, in public institutions. There are also few published traces of Bäck’s interest in natural history. 93 Instead, Bäck’s contributions were mainly practical and political; e.g. he was prominent in establishing botanical gardens in Stockholm, and his position as chief physician to the Royal house gave him ample opportunities to lobby in favour of Linnaeus’ many projects at the court and elsewhere. 94

Next to the practical and political dimensions to Bäck’s interest in natural history, it formed a cornerstone of his relationship with Linnaeus. Their long friendship (begun in the 1740s) was “consummated” on excursions and while immersed in one another’s collections. For example, Linnaeus often had errands to run in Stockholm (just a single day’s travelling from Uppsala). On such visits he often stayed with or close to Bäck so that “we at night’s evenings may examine plants”. 95 In return, Bäck had a standing invitation to visit Linnaeus, to botanize and socialize: “If it is possible in any way dear brother, so tear yourself away and come to me, so that we may live together a couple of weeks, in Botanical peace.” 96 Linnaeus would long most for his best friend towards the beginning of a summer, in the peace that followed the last of his excursions around Uppsala and the end of term.

The intensity of this socializing brought the families of Bäck and Linnaeus’ closer together. Linnaeus’ wife Sara Lisa Linnaeus regularly accompanied him to Stockholm, and e.g. on the occasion of the coronation of Gustav III, she and Linnaeus’ daughters stayed with Bäck (Linnaeus remained in Uppsala, to avoid the spectacle). 97 Bäck’s family and children – Carl Bäck had two sisters – were regularly invited to Linnaeus’ home too. 98 The growing intimacy between the families is also visible in the correspondence: in letters to Bäck, Linnaeus discussed the welfare of the families, and particularly the children’s health. Marriages, births, baptisms, and bereavements were common themes, and Carl Bäck’s health in particular was a frequently
visited topic. Appropriately enough, perhaps, the last letter Linnaeus ever wrote was in response to the news of Carl Bäck’s death. Linnaeus’ age and confused mind (he had suffered several strokes) are apparent here in the handwriting, an error (of 20 years) in the dating, and in a sudden change from Latin to Swedish. Nonetheless, the few words he did manage effectively communicate empathy and friendship, and perhaps also an awareness that his own time was running out: “Live well. I am my brother’s; my Brother is mine. I am My Brother’s forever in death.”

The friendship between Bäck and Linnaeus and their joint interest in natural history is also revealed in the care that Linnaeus took over Carl Bäck’s education. He furnished Bäck junior with presents in the form of specimens and small collection “to train on” from the age of five, and in anticipation of young Bäck’s month-long visit to Uppsala (as a ten-year old) Linnaeus promised to take better care of his visitor than of his own children. Judging by the many concerns Linnaeus had with Carl Bäck it is clear that Linnaeus viewed him as a close relative: he was his “little brother Carl”. There was an intimacy here that informed the education and which was rooted in the friendship between Linnaeus and Abraham Bäck. In this respect, the project of educating Bäck junior consolidated their friendship.

Drawing on the earlier discussion of the formation of elites and the tradition amongst elite families to send their children to one another (as a way to encourage the youths to form relationships with prominent members of the elite, and to teach them to behave in a way that helped them gain trust within this elite) we can interpret Carl Bäck’s education as part of an elite stratification process. Bäck and Linnaeus were some of the most prominent people in the world of eighteenth century Swedish natural history. As the previous discussion suggests, between them they held sway over several generations of medics and natural history students. It is not surprising that they also took care of their own families’ continued influence. By 1763, Linnaeus had already been promised that his son would inherit his professorship.

This analysis might prompt one to wonder about Abraham Bäck’s relationships with the other naturalists his son visited. As Hasselberg, Müller and Stenlås have pointed out; geographical closeness and membership of the same social class are conditions beneficial to the formation of network relationships. The social history of these relationships also indicates that they tend to be formed more easily within the top social stratum – they tend to be more prevalent among the elite than among members of lower classes. Linnaeus and Bäck were not only geographically close (a day’s travel) to one another, they also belonged to the same social stratum, closely affiliated with the governing elite. What marked Blom, Hagström, Hernquist, Montin and Ferber’s positions in the first instance was their relative isolation from the political and scientific centres constituted by Linnaeus’ Uppsala and Bäck’s Stockholm. Around 500 kilometres separated the homes of Osbeck, Montin and Ferber (in Hasslöv, Halmstad and Karlskrona respectively) from Stockholm, a distance that took several days to traverse. Although Hernquist in Skara, Blom in Hedemora and Hagström in Linköping lived closer (200–350km from Stockholm) the distance was still significant enough to preclude frequent visits. Secondly, these regional scholars belonged to a different social class; Montin, Hagström and Blom were district physicians, Hernquist was a lecturer and Osbeck a dean. This subordination coloured their relationship with Bäck senior. Although as between Linnaeus and Bäck, natural history was a prominent mutual interest, their letters did not breathe intimacy and brotherhood, and when corresponding with Bäck the regional naturalists wrote to “His Excellency, the Archiater.”
There are several explanations of the use of this address, beyond the fact that Bäck senior was socially superior and geographically remote. First of all, as district physicians Blom, Hagström and Montin, were subordinate to Bäck senior – he was their boss. Moreover, and perhaps most importantly, Bäck had in several cases played the role of patron relative to the provincial naturalists that hosted his son. The best example is Osbeck whom Bäck had helped in several ways. Osbeck was the son of crofter. After his trip to China Bäck (and Linnaeus) suggested Osbeck as a client to Carl Gustaf Tessin (1695–1770), one of the most prominent politicians of the time. Osbeck was appointed domestic chaplain, and curated Tessin’s natural history collection for five years before Tessin helped Osbeck to gain the vicarage in Hasslöf. Bäck had also loaned Osbeck money – as Osbeck mentioned several times around the time of Bäck junior’s visit.

Although Abraham Bäck’s relationships with many of the regional naturalists exhibited characteristics of a patron-client relationship, his son’s education marked a small change. Carl Bäck’s visits to the regional naturalists can be understood as sign that Abraham Bäck was prepared to have greater intimacy with this circle. It is with this in mind that we can understand how the prospect of Carl Bäck’s visit produced an “invaluable delight” in Hagström and “honour” and “yearning” in Ferber. When Bäck arrived Hagström cried with joy (according to Lindwall) while Ferber, reporting on the visit to Abraham Bäck, pleaded for more visits, soon. One of the few existing letters from Abraham Bäck to his son’s hosts – in this case Carl Magnus Blom – suggests that Abraham Bäck’s response was somewhat similar. Following his son’s visit in the summer of 1775, and now feeling more closely “united” with Blom, Bäck invited him and his wife to come and stay with him in Stockholm.

It is also notable that in the correspondences that succeeded Carl Bäck’s visits, the hosts commented on the boy’s education and development as a naturalist as well as his health, suggesting that Abraham Bäck should periodically update them of his son’s intellectual progress and physical decline. The relationships between Abraham Bäck and his son’s hosts did, then, become more intimate in a sense, and in that limited respect came to resemble Bäck senior’s relationship with Linnaeus.

This change was not only potentially beneficial to the district physicians, in terms, e.g. of raising their status in relation to Bäck. It is also important to acknowledge the benefits that Bäck secured by renegotiating his relationship with the district naturalists – most significantly, contributions to his son’s education (albeit in a much less formal sense than what was provided by Carl Bäck’s tutors). As I discussed in the previous section, episodes such as the encounter with Montin and Osbeck should have taught Bäck junior about the rules for exchanging material and knowledge display techniques from properly educated Linnaean naturalists. Against this background I suggest we should understand the intimacy that Bäck initiated by sending his son to visit these people as founded on a trust in them as naturalists – a status they had earned through their education and long-term correspondences with Bäck on natural history.

It is possible to situate this trust within the framework suggested by Steven Shapin: i.e. between, on the one hand, the trust that marked relationships between gentlemen scholars in seventeenth century England (and which was based on their shared social status and associated codes of behaviour) and on the other, the system trust that marks modern sciences and which draws on the professional status of scientists and their location within an academic system. The trust that Bäck felt for his correspondents was, I suggest, rooted in their education in, and
knowledge of, Linnaean natural history. From this perspective, his trust exhibited some of the characteristics of the modern scientific trust system, where education forms an important marker and maker of the professional, modern scientist. It was the centrality of this knowledge that made it possible for Osbeck, the son of a crofter, to be presented as an innovative displayer of naturalist knowledge. The meritocratic and inclusive dimension that this emphasis on education suggests is, however, tempered by the fact that the case study on which we have focused concerns the son of one of the most influential collectors and patrons of natural history in Sweden at the time. We can suspect that Bäck, like Linnaeus, was keen to secure his son’s status, as a member or possibly even a leader of a Swedish naturalist elite. Bäck extending his trust to the regional naturalists can be seen as an attempt to contribute both to his son’s future status and to the elite-making process. In this respect it is reminiscent to how early modern gentlemen scholars used science to legitimate and demonstrate their status as an elite, both individually and collectively. The responses from the regional naturalists following Carl Bäck’s death in November 1776, indicate a somewhat similar understanding of the role that had been anticipated for young Bäck. The letters of condolence describe the death as a cause for personal grief and sympathy for Bäck’s family, but also a concern for the community of Swedish naturalists who had lost a potential leader and patron. Of course, letters of condolence are not always sincere, and it is possible that if Carl Bäck had survived he would have experienced a fate similar to that of Linnaeus’ only surviving son. As Linnaeus junior’s letters to his father’s best friend reveal, his short tenure as professor in Uppsala was marked by constant questioning of his knowledge and merits from his father’s students (particularly Lars Montin). This suggests a real tension between the meritocratic and the elitist dimensions of Linnaean natural history.

This brings us to the end of this paper and to some final thoughts on how the results can contribute to an understanding of the late eighteenth and early nineteenth century developments of natural history in Sweden. Linnaeus continued to dominate this period. There were some influences from outside – German romantic ideas shaped natural history in Lund and in Uppsala, plant geography (inspired by Humboldt) made inroads. But in other respects, Linnaeus’ students and their students continued to describe and record species (with some areas, such as entomology and lichenology, seeing more activity than others) in much the same ways as their teacher. Only in the 1860s did things change significantly: university and gymnasium reforms and new institutions in combination with influences from Darwin opened up for debate and specialisation.

However, rather than thinking of this period primarily as one awaiting new ideas and reforms, we should perhaps consider the first half of the nineteenth century as a period of stratification – a process in which a Linnaean scientific persona formed a reference point for geographically scattered naturalists, adjusting to work without the support of the political elite or the Republic of Letters (yet not yet replaced by national and international intellectual frameworks). If so, what role was played by private education and households in reproducing knowledge between individuals and across generations? The birth of a number of Swedish ‘botanical dynasties’ suggests that at least some families were successful where Abraham Bäck and Carl Linnaeus had failed (on account of their sons’ premature deaths). That is, in some cases,
knowledge and status were passed on from father to son. Can a “bifocal” educational history of the nineteenth century, taking into account the interplay between the early modern tradition of in-house education and tutors (which slowly declined through the nineteenth century) and the existing and changing educational structures of the new century, help us better to understand a period of natural history traditionally demeaned as uneventful and intellectually moribund?


3 This article is partially based on results from a research project (“Learning a nd Teaching in the Name of Science – a Study of Linnaeus and his students”) financed by the Swedish Research Council (Vetenskapsrådet). It also includes some arguments which I originally presented elsewhere (predominantly in Swedish publications), see Hanna Hodacs, ”Att lära sig umgås i och runt naturen”, (ch. 5) in Naturalhistoria på resande fot. Om att forsa, undervisa och göra karriär i 1700-talets Sverige, (co-authored) Hanna Hodacs and Kenneth Nyberg (Lund: Nordic Academic Press, 2007) and Idem, ”Att utbilda en “älskare” – naturalhistorisk skolning i Linnés anda”, in Mellom pasjon og profesjonalisme. Dilettantkulturer i skandinavisk kunst og vitenskap, ed. Marie-Theres Federhofer and Hanna Hodacs (Bergen: Tapir Academic Press, 2011). I would particularly like to thank Kenneth Nyberg (as always) and Marie-Theres Federhofer for their contributions. Discussions with Jenny Beckman has also been instrumental for developing my ideas.


7 For a recent discussion of the changing meaning of these terms and their historical contexts see Marie-Theres Federhofer, “Dilettantismens potensial”, in Mellom pasjon og profesjon, (op. cit. 3), pp. 11-29.


19 Hodacs and Nyberg, *Naturhistoria på resande fot* (op. cit. 3), see particularly ch. 6 (by Nyberg) "Att samla ära, meriter och naturalier", and ch. 3 (by Hodacs) "Att resa ut som student och komma hem som forskare".


22 I have arrived at this number via a cross reading of Sanderman Olsen *Bibliographia discipuli Linnaei* (op. cit 21) and Dahlgren’s register of members of the Royal Swedish Academy of Science (Erik Wilhelm Dahlgren, *Kungl. svenska vetenskapsakademien: personförteckningar 1739-1915*, Stockholm: Almquist & Wiksell, 1915). Only students of Swedish (including Finish) origin have been included.


25 Alix Cooper, *Inventing the Indigenous* (op. cit. 9).


31 von Platen, *Privatinformation* (op. cit. 29) and Idem,” Informatorn”, (op. cit. 30).


34 Ihre 187:4, Uppsala University Library (UUL).

35 Ihre 187: 2-3, UUL.

36 Ihre 187: UUL.

37 Some of these correspondence series have been printed, see Johan Otto Hagström, ‘Wälborne Herr Archiatern...’ *Johan Otto Hagströms brev till Abraham Bäck 1747–1791*, (Linköping: Östergötlands Medicinhistoriska Sällskap, 1997); Peter Hernquist, *Peter Hernquists brev till Abraham Bäck 1763–1792*. Tolkade och kommenterade av Ivar Dyrendahl, (Stockholm: Skogs- och lantbruksakademin, 1992). Most of the others (including letters from Carl Magnus Blom, Johan Jacob Ferber, Lars Montin, and Pehr Osbeck) are located in the archives of Hagströmerbiblioteket (HB), Karolinska Institutet, Stockholm.


40 Hodacs, “Linnaean outdoors” (op. cit. 18). More detailed discussions can also be found in Hodacs and Nyberg *Naturalhistoria på resande fot* (op. cit. 3) see particularly ch. 4 (by Hodacs).


45 Grape, *Ihreska handskriftsamlingen*, (op. cit. 39), p. 622, n. 5; Franzén, ”Montin, Lars,” (op. cit. 44).

46 5/8 1774 (Ihre 187:1, UUB).


49 3/6 1775 (Ihre 187:2, UUB).

50 3/6 1775 (Ihre 187:2, UUB).
commitment to teach Carl Bäck Söderberg hesitated changing his career plans. Some sort of conflict seems also to have arisen regarding the latter's skrifvelser (8/8 1774, UUB).

53 See also Linnaeus on Hjortberg’s lack of education in natural history in Lindroth “Vardagsro and söndagslust,” (op. cit. 51) p. 142.

54 1/8 1774 (Ihre 187:1, UUB).


57 For further references and a summary of this interest and the exchange it generated between above listed persons, see Hodacs, “Att lära sig umgås i och runt nature,” (ch. 5.) in Hodacs and Nyberg, Naturalhistoria på resande fot, (op. cit. 3), pp. 108-110.

58 Ferber international career in mineralogy and extensive travelling (documented in several contemporary accounts) is probably the most well known of these individuals (Nils Zenzen: “Ferber, Johan Jacob,” Svenskt biografiskt lexikon, bd 15, Stockholm 1956, pp. 589-595). The others have been discussed by Lindroth in his broad discussions of early modern Swedish history of science (see, e.g. Sten Lindroth, Kungl. Svenska vetenskapsakademiens historia 1739–1818, Avdelning 1, 2 vols., Vol. 1: Tiden intill Wargentins död (Stockholm: Almqvist & Wiksell, 1967, and Idem, Frihetsstiden, op. cit. 4). Hagström and Hernquist have also been made objects of (a short) biography and a long article (Gudmar Hasselberg, Johan Otto Hagström 1716–1792. En jämtländsk kulturpersonlighet på 1700-talet (Östersund: Bokmalens förlag, Banbytare och föregångsmän II, 1961) and Henrik Sandblad, “Linneanen Peter Hernquist, medicin och upplysningsfilosofien,” Lychnos, 1971-1972, pp. 1-79). See also Bertil Boëthius, “Blom, Carl Magnus,” Svenskt biografiskt lexikon, bd 5, Stockholm 1925, pp. 1-7. For literature on Osbeck and Montin see note 44. A more detailed discussion of the exchange of material relating to natural history that took place between Bäck senior and these individuals (including Linnaeus) can be found in Hodacs, “Att lära sig umgås i och runt nature,” (op. cit. 57) p. 108-110.

59 Sven-Erik Sandermann Olsen, Bibliographia discipuli Linnaei, pp. 79, 128, 166, 185, 194, 251 275, 302, 370.

60 Bruce T. Moran, ed., Patronage and Institutions (op. cit. 42).


63 Linnaeus to Bäck 9/3 1769, Linné, Bref och skrifvelser (op. cit. 38) l:5, pp. 161-163.

64 Linnaeus to Bäck 13/9 1772, Linné, Bref och skrifvelser (op. cit. 38) l: 5, p. 200, see also idem 28/12 1772 and undated (but probably from Nov. 1774), pp. 201-202, 222-223.

65 See also Linnaeus’ discussion of Hedin’s experience of having combated tuberculosis, Linnaeus to Bäck undated (but probably from April 1775), Linné, Bref och skrifvelser (op. cit. 38) l: 5, p. 230-231.

66 Linnaeus describes Hedin’s reaction in a letter to Bäck undated (but probably from April 1775), Linné, Bref och skrifvelser (op. cit. 38) l: 5, p. 231. See also Lindwall to Bäck, 7/4 1774, MS 36:20:1, HB. As I discussed above Söderberg hesitated changing his career plans. Some sort of conflict seems also to have arisen regarding the latter’s commitment to teach Carl Bäck, see Linnaeus to Bäck 15/8 1769, Linné, Bref och skrifvelser (op. cit. 38) l:5, p.167.


69 On the role of Collegium medicum in appointment processes see Hjelt, Svenska och finska medicinalverkets historia, (op. cit. 10) Vol. 1, pp. 31, 535-539. See also Lindwall to Bäck (1/5 1788, MS 36:20:4, HB) where
Lindwall names Bäck as the person who helped him combine the position as district physician in Blekinge with the position as town physician in Karlskrona.

71 Linnaeus to Bäck 1/7 1769, Linné, *Bref och skrifvelser* (op. cit. 38) I: 5, p. 165.
73 On Bäck’s role mediating in conflicts and advising his district physicians see Grape, *Ihreska handskriftssamlingen* (op. cit. 39), pp. 511-512.
74 27/7, 16-17/8 1774, Ihre 187:1, UUB.
75 2/6, 7-8/6 1774, Ihre 187:1, UUB.
76 10/6, 24/6, 6/7, 10/7, 16-17/7, 7/8 1775, Ihre 187:2, 1775 and 23/9 1776, Ihre 187:3, UUB.
77 Hodacs, “Linnaeus outdoors” (op. cit. 18).
78 2/6, 7-8/6 1774, Ihre 187:1, UUB.
79 10/6, 24/6, 6/7, 10/7, 16-17/7, 7/8 1775, Ihre 187:2, 1775 and 23/9 1776, Ihre 187:3, UUB.
80 Linnaeus to Collegium medicum, undated but read 27/1 1774, Collegii Medici Acter 1774, RA.
81 Pandora et flora rybyensis.
87 Hasselberg, Müller and Stenlås, ”Åter till historiens nätverk”, (op. cit. 27), pp. 9, 14-15.
89 As Otto Hjelt points out, the relationship between Collegium medicum and particularly the Medical school in Uppsala became much closer following Bäck’s appointment as president of the former organisation, Hjelt, *Svenska och finska medicinverkets historia*, (op. cit. 10) Vol. 1, p. 167.
91 Linnaeus to Bäck 5/6 1752, Linné, *Bref och Skrifvelser*, (op. cit. 38) I:4, p. 179. See also idem, undated (but probably from May or June 1750) and 27/12 1763, Linné, *Bref och Skrifvelser*, (op. cit. 39) I:5, p. 124 and I:5 p. 117.
100 Linnaeus to Bäck, 5/12 1756 (sic! 1775), i Linné, *Bref och Skrifvelser*, (op. cit 38) I:5 p. 239.


Fries, Lefnadssteckning, (op. cit. 83) Vol. 2, p. 108. Note however that Linnaeus initially planned Daniel Solander to become his successor.

Hasselberg, Müller and Stenlås, “Åter till historiens nätverk”, (op. cit. 27), p. 23.

See e.g. Hagström’s letter to Bäck, in Hagström, ‘Wälborne Herr Archiatern...’ (op. cit. 37).


Hagström to Bäck, 18/4 1774, Hagström, ‘Wälborne Herr Archiatern...’ (op. cit. 37) p. 176 and Ferber to Bäck, 2/6 1774, MS: 26: 84-90, HB.

27/5 1774, Ihre 187:1, UUB, and Ferber to Bäck, 26/6 1774, MS 26:84-90, HB.


Hagström to Bäck, 10/5 1775, Hagström, ‘Wälborne Herr Archiatern...’ (op. cit. 37). p. 194; idem, 17/8 1775, ibid, p. 195: idem, 3/10 1776, ibid, p. 202; Hernquist till Bäck, 30/9 1774, Hernquist, *Peter Hernquist brev* (op. cit. 38). p. 80; idem, 8/7 1775, ibid, p. 86; idem, 11/2 1776, ibid, p. 93; Blom to Bäck, 3/8 1775, MS, 35: 21: 1, HB; Montin to Bäck, 17/11 1775, MS 36:28:1-17, HB: Ferber to Bäck 14/4 1776, MS 26:84-90, HB.

