

3 | *The practical and material framework*

Members, buildings and economy

This chapter describes the changes in the composition of the members of the Academy of Sciences, its property portfolio and the organisation's finances, from its founding in 1739 to the early 21st century. These different asset types are gathered in the same chapter because they both limited and provided potential for activities in an informal, but very tangible, manner. They comprised the actual framework for activities. However, members, premises and finances were fairly slow-moving assets and frameworks in the sense that they could only be replaced gradually and on particular occasions. For example, there was no way of shortening the process for members who in some way did not fit into activities as they changed; instead, adjustments were sluggish, almost generational. In the same way, buildings were significant financial commitments that often governed activities for a very long time. As much as they provided space for some activities, they also made others more or less impossible. Last but not least, the Academy's financial position provided a material framework for activities, because financial assets and good results were the foundation for various initiatives, in the same way that debts and losses inhibited them. Here too, a change of direction could take a long time, and getting unstable finances back in balance could be particularly challenging. This chapter focuses on three themes, covered chronologically. First, the composition of the members is described. This is followed by a review of the Academy of Sciences' fixed assets in terms of buildings and land. Finally, the finances of the Academy of Sciences up to the 21st century are discussed.

Members

The personal backgrounds of the five founders of the Academy reflect the societal contexts of knowledge in the 18th century, outside the world of the university. Only one exception, Linnaeus, with his clear links to academia, confirmed the rule, even if he did not become a professor until two years after the establishment of the Academy of Sciences. The young founders of the Academy presented an alternative to the view of knowledge established by the universities' hierarchical organisation, with natural history and natural philosophy as its broad base, with medicine and law in a narrower central layer and theology at its peak. There was a point to the founders being a mixture of higher public officials, politicians and scholars. In common, they had politics, trade and agriculture as their foremost hallmarks, as well as an interest in a new, broadly focused natural philosophy that also included botany and mechanics. They included the up-and-coming men among the Hats, Anders Johan von Höpken and manufacturer Jonas Alström. They were balanced by the agriculturally interested Cap and lawyer Sten Carl Bielke, by Mårten Triewald, already famous for his lectures at Riddarhuset, and by the always absent chamberlain and agriculturalist Carl Wilhelm Cederhielm.¹ From its very beginnings, the Academy of Sciences was an alternative knowledge organisation.

FROM THE FOUNDING OF THE ACADEMY OF SCIENCES IN 1739 and subsequent decades, its membership has consistently been characterised as “a mixed company”.² There were counts and ministers and pharmacists and accountants. Naturally, university professors were soon an important component among the members, but there were also many others. This variety reflected the knowledge practitioners of the 18th century, where learning could rarely be easily distinguished from commercial or political social spheres.³ The Academy's heterogenous character was described by a contemporaneous witness as an assembly consisting of “protectors and protected”, with representatives of political and commercial life on the one hand and of natural history and natural philosophy on the other.⁴

Another way of approaching the subject is to note the discussions regarding what could be required of members elected to the Academy. Some, like Linnaeus, wanted to demand that nominated members must have submitted beneficial findings before consideration for election, or that the Academy could hope for some kind of benefit or service from a nominated member.⁵ However, this type of counter-performance was rarely required. Quite the opposite, as the poor finances of the early years undoubtedly led to the election of new members who were not only considered because of their scientific interest, but also because “they are wealthy and lack direct heirs”.⁶

Kongl. Vetenskaps ACADEMIENS
Herrar Ledamöter, behagade i
Hörjon, som är Onsdag, d. 9 AUGUSTI,
kl. fyra eftermiddagen, på Riddare-huset sig in-
finna, at sedermera därstädes uti Stora Salen afhöra
det Minnelse Sal, som öfver Des framledue Sedamot,
Bärgs-Rådet Herr GEORG BRANDT, offenteligen
kommer at hållas.

PARENTATIONS TO DECEASED MEMBERS have been an important element of the Academy of Sciences' memory culture. The picture shows an invitation to a parentation in memory of Mining Councillor Georg Brandt in 1798.

However, on odd occasions, members were excluded in accordance with an article in the statutes regulating how a member could lose his place if he did not present relevant findings or other endeavours within two years. For example, in 1748, no fewer than five members were excluded in one go, a measure eagerly supported by Linnaeus.⁷ The last time that members were excluded due to inactivity was 1783, when another five members lost the right to attend, the reason being that they had so little regard for the Academy's "reputation and best interest".⁸ Interestingly, this measure did not prevent the Academy, twenty-five years later, from organising a thoroughly overblown parentation for one of these excluded members, who was then showered with praise. The exclusion of Vice Admiral Carl Olof Cronstedt should also be mentioned, after he was blamed for the loss of the Sveaborg fortress, outside Helsinki, to Russia in May 1808.

This combination of an interest in knowledge and economic-political involvement was maintained through a somewhat conservative election

process, which entailed a new member being nominated by a person who had already been elected, with that proposal then requiring a three-quarter majority of the votes of those present to be accepted. If the expression “like likes like” is correct, then this process naturally entailed the composition of the members of the Academy of Sciences being preserved, thus becoming strongly path dependent.

JUST TWO AND A HALF YEARS AFTER IT WAS FOUNDED in 1739, the number of members had grown to 64, and five years later there were 94.⁹ Among the first 67 members, it is noteworthy that almost half had a foreign background, usually German, but also British, Dutch and Danish. As regards the members’ geographical upbringing, more than one-third had grown up in the Stockholm-Uppsala area, including Uppland, but only one was from Södermanland.¹⁰ In this assembly it is also worth noting that only three members had hereditary titles, while almost one-third were ennobled officials, i.e. they received their titles as a recognition of service and so as to continue their careers in collegiums.¹¹ The new nobility expanded hugely during the first decades of the Age of Liberty, 1719–1772, and the Academy assembly is a good reflection of the conditions for officials in collegiums.¹² It is notable that the majority of the academy secretaries in the 18th century – Faggot, Elvius, Wargentin, Nicander, Wilcke, Svanberg and Sjöstén – were and remained commoners.¹³

During the 1740s and 1750s, various regulations and agreements were introduced and expansion slowed; the number of Swedish members was capped at one hundred, a maximum number that was adopted in 1762 and was described in the previous chapter. New members were subsequently only elected when someone died, or in the rare cases when someone was excluded. Of the 100 first elected members, only 15 held the title of professor, or would receive it during their time as a member.¹⁴ The proportion of professors among the next 100 members who were elected had grown, but only to a quarter. In 1939, the Academy was expanded through the addition of 30 extra members, for which classes in need of reinforcement could apply. In 1947, the number of Swedish members of a maximum age of 70 was increased to 140 and, in 1973, this limitation was diluted by now only applying to members up to the age of 65. In parallel, in 1798 the number of foreign members was limited to 75, a number that was gradually increased. Presently, the number of members who are 65 or younger is set at a maximum of 175. The Academy now has around 450 Swedish members and 175 foreign members, which means the average age is relatively high.

When Berzelius took over the post of secretary in 1818, almost one-fifth of the members were from the aristocracy – often landowners or higher officials such as members of the privy council or collegium presidents –

priests, surveyors and master mariners, as well as military commanders and clerks.¹⁵ The number of professors and university lecturers was almost as great. Other well-represented professional groups were lower officials, doctors, artists and *mechanici*, a title for theoretically educated and technically experienced men who worked at a collegium or in mining, for example.¹⁶ In other words, from 1739 to 1818 the proportions of various professional groups in the Academy were fairly constant.¹⁷

THIS RELATIVELY STABLE COMPOSITION of Academy members can be regarded as an expression of strong path dependence. If so, its foundation lay in the conservative tendency that could arise if Academy members proposed and elected members with similar backgrounds to themselves. Equilibrium was maintained as long as this practice continued. However, if one group started to elect more members or prevented other member categories from electing candidates of the same background, shifts could occur in the composition of the Academy, which is what appears to have happened from the mid-19th century, when the proportion of university lecturers in the Academy rose to half – or two-thirds, if this category is expanded to include physicians and engineers.

These changes in the members' backgrounds were due to reforms caused by changes to the statutes in 1818. The dissolution of the Academy of Sciences' heterogenous character began slowly in the 1820s, with an increasing proportion, around a third, of new Swedish members holding a position at a university. As stated above, the recruitment of university lecturers increased during the 1850s, finally comprising half of the new Swedish members.¹⁸ It is interesting to note that these new class divisions, launched thanks to the new statutes in 1820, reflected university subjects more strongly than previously, including mathematics, physics, chemistry and mineralogy, zoology and botany, as well as medicine. This was an organisational signal of stronger institutional uniformity with the universities, boding an imbalance between the classes if too many people were elected to the broader general class of general scholarship. (See the diagram on p. 631 in the appendix, top right, where the green columns that represent university employees increase from the mid-19th century.)

The slow shift towards a greater proportion of university employees in the 19th century is probably linked to the significant expansion of higher education institutions, not least in Uppsala and Stockholm, where the university was growing and new university colleges and institutes were being founded for professional training, such as the Institute of Technology and the Caroline Medico-Chirurgical Institute.¹⁹ At this time, universities and their teaching staff also became more autonomous from the church and career paths within the church and universities increasingly diverged. The theological

faculties' status was hollowed out, with hope and faith focusing on the natural sciences in the philosophical faculties, which received greater amounts of laboratory resources in an era that began to be described as that of steam and electricity. Theology and the church were not the only things to lose authority. The military was also slowly loosening its grip on societal institutions, due to Sweden's success in avoiding armed conflicts from the 1820s onwards. In other words, the mid-19th century was an eventful time and had repercussions on the composition of Academy members. This was the context in which the strong path dependence of the members' backgrounds was broken. The Academy of Sciences became less of a mixed academy for meetings between different social categories and more of a scientific academy, one where science no longer represented knowledge in general, but instead a type of systematic knowledge, one preferably linked to medicine and the natural sciences.

And so it has remained; from the second half of the 19th century, the Academy of Sciences has continued to be a primarily scientific assembly, not least due to greater recruitment from universities and other higher education institutions. However, both before and after the changes to the proportions of members' professional categories that occurred over a few decades in the mid-19th century, the composition of member occupations has been relatively constant.

AS FOR ACADEMICALLY ACTIVE MEMBERS, there is an imbalance that tends to favour the universities in Uppsala and Lund and the Caroline Institute. However, from the latter part of the 1960s, this recruitment base has broadened considerably and members active in academia have been increasingly recruited from higher education institutions other than those that dominated as recently as the 1930s. There is a natural link with the post-war expansion of the universities in Stockholm and Gothenburg, but also with the creation of more higher education institutions in the 1970s and 1980s, which widened the institutional basis for recruitment.

The gender distribution of members has historically been one-sided, due to a persistent male dominance. The first woman, Eva Ekeblad (nee De la Gardie), was married to privy councillor Claes Ekeblad, a Hat who was one of the Academy's most important patrons. She was elected in 1748, fewer than ten years after the Academy was founded. Countess Ekeblad's qualifications, excepting lineage and family, comprised an article in the Academy's *Transactions*, but she did not participate in any meetings.²⁰ Twenty-five years later, the first foreign female member was elected – a Russian princess who, at the time of her election, was on a fourteen-year European journey. But these two women were exceptions. Scientific activity was an area particularly associated with different men, and the Academy of Sciences clung to this

view by not electing female members, with the exception of a countess and a princess. For this reason, no other women were elected to the Academy of Sciences throughout the 18th century. The Academy was purely a gentlemen's club.

It continued in the same way in the next century: no women were elected at any point in the 19th century. This was absolutely consistent with that era's view of women's societal roles, one reflection of which was the legal support for their exclusion from academic life in general. Even if the first female professor in Sweden was Sonia Kovalevsky, at Stockholm University College at the end of the 19th century, this was only possible because it was a private institution. Until 1925, women were prohibited from holding higher state offices.²¹ Despite it being legal to elect women as members of the Academy of Sciences, not a single Swedish woman was elected before World War Two. However, Marie Curie was voted in as a foreign member in 1910.

When a fourth woman was finally elected, in 1945, she possessed scientific expertise and a reputation that was anything but commonplace. She was the Austrian professor of physics Lise Meitner, who was elected as a foreign member after fleeing to Sweden to escape the Nazis. She became a Swedish member in 1951. Meitner was an international scientific star, thanks to her decisive interpretations of experiments in nuclear physics in Berlin during the 1930s; these led to the insight that chain reactions were possible, which came to be the basis of atomic weapons. It would hardly have been possible to exclude her from the Academy, however much the men there might have wished to.²²

When Lise Meitner died in 1968, the Academy was once again devoid of women for some years. As recently as 1975, astronomer Aina Elvius was elected as the fifth woman. Two women were then elected in 1978 and another two in 1980. Nowadays, there are more women in the Academy, but still no more than just over ten per cent, showing a strong homosocial path-dependence and, once again, demonstrating how long it takes to change the composition of members through elections.²³

It is possible that this remarkable lack of change could be explained by a lack of electable women. There were undoubtedly few women at Swedish universities, even if there was the odd associate professor and lecturer. The first female professor at a publicly funded university was not appointed until 1937, and the next one was not until ten years later.²⁴ As recently as the 1960s, it was still rare to have female professors in Sweden, and it was first during the 1970s that it was possible to start counting female professors as a few per cent. However, despite the lack of female professors, it is still remarkable that the Academy did not succeed in electing female members from among the associate professors and few professors who, in spite of everything, were available. Another unutilised option was to elect women who had academic



THE FIRST THREE WOMEN TO BE SWEDISH MEMBERS.

Eva Ekeblad De la Gardie, known for inventing potato spirits, was elected to the Academy of Sciences in 1748. After this, there were no more women until 1951, when physicist Lise Meitner (pictured above right), who was previously a foreign member, was given Swedish citizenship. Astronomer Aina Elvius (right) was elected in 1975.

qualifications but who were not working in academia. Men could still be elected using such a quota after the mid-19th century, even if this had become more unusual. Instead, the lack of female members in the Academy of Sciences must be seen in the light of the male-dominated homosocial environment in science and research in general, and in the Academy of Sciences in particular.

Such a conservative relationship would probably have been based upon the extensive and overarching perception that the practices and institutions of science were primarily maintained by men. These types of values could sometimes be tellingly expressed, such as when Kovalevsky's election was discussed in the mid-1880s. Those opposed to her election referred to the statutes regulating how "Swedish men" were electable. During these discussions, the permanent secretary is also said to have asked: "If the Academy starts to elect women, where on the scale of creation will this come to an end?"²⁵ It is clear that if the Academy was homogenised through growing numbers of *male* scientists in the 19th century, it was first in the decades around 2000 that this increasing path dependence gradually began to break down, as women were elected more often than previously.

MORE RECENTLY, the recruitment of new members to the Academy of Sciences has begun to change, due to the creation of the Young Academy of Sweden in 2011. The inspiration for this came from Germany, where *Die Junge Akademie* was founded in 2000. The purpose of the Young Academy of Sweden is to create an interdisciplinary forum for young researchers, as well as a basis for actions on research policy and more outreach activities. After two years, this young academy was hived off from the Academy of Sciences; a foundation was launched to ensure the 20 or so members could act as independently as intended. The requirement for members was that they should not have obtained their doctorates more than around ten years ago at the time of their appointment. Unlike the circumstances of the actual Academy, positions in the young one are limited to five years. New members are elected every year after application, renewing the group, so that five years after it was founded it had almost 50 members. Despite its name, this means that the members in the Young Academy of Sweden could be a good bit above 40 years old on admission and almost 50 once they have completed a five-year term.

It remains to be seen whether the future recruitment of members to the Academy of Sciences will be based upon former members of the Young Academy of Sweden. There is a great deal to indicate this. There have been complaints that many candidates are happy to be elected as a member of the Academy of Sciences, but that they are then not as eager to assume any tasks. The Young Academy of Sweden can be used to identify younger talent earlier, i.e. the people who have the initiative, interest and the sense of responsibility that is required of Academy members, so that a scientific academy can be the force for change it has the potential to be in a knowledge society. In the long term, the Young Academy of Sweden may thus contribute to members elected to the Academy of Sciences having a documented interest in the type of tasks that academy members must perform to maintain its vitality.

Buildings

Initially, Academy members held their meetings in Riddarhuset – the House of Nobility – in Stockholm. This was largely due to Academy founder Mårten Triewald. Ten years previously, he had held renowned lectures on the new experimental physics, and subsequently been active in the renovations to Riddarhuset’s top floor, resulting in a lecture room that Triewald had at his disposal.²⁶

When the observatory opened in 1753, it was the first building to be constructed specifically for the Academy of Sciences, becoming its main building.²⁷ As with all buildings, it was a major investment, a risk, that defined the conditions for activities for many years. For a scientific academy with a



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*Power and
the observatory*
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newly built observatory, astronomy will certainly be among its most important activities. The same applies to buildings in general; because they almost always require considerable investments, and their size, design and location govern the activities that take place in them in a very tangible manner, they often comprise the single most important material framework.

An important background to the observatory in Stockholm was that astronomical observations required international cooperation which, in Europe, was closer to hand for scientific academies than for universities.²⁸ The Swedish Academy of Sciences was no exception. Here too, astronomy was soon a true area of excellence, partly because knowledge of the movement of heavenly bodies corresponded well with the almanac monopoly, at that time the Academy's only real source of income. It is also relevant that the observatory was built on the highest point of the Brunkebergsåsen ridge, which came to be called Observatoriekullen, thanks to two early and influential Academy secretaries: the astronomers Pehr Elvius and Pehr Wargentin, one after the other. The new observatory lay like the northern outpost of the city, as elevated as the city's churches, which had also been built on hills: Katarina, Storkyrkan, Hedvig Eleonora, Kungsholmen... Constructed so that observers would raise their eyes to heaven, the observatory was also a type of church, one primarily built to honour science rather than God.

Secretary Pehr Elvius was the one to initiate its construction, taking his chance when the architect and person in charge of completing the new Royal Palace of Stockholm after the old castle burned down in 1697, Carl Hårleman, was Academy president in 1746. Two years later, construction of the observatory building began with the help of the King in Council, which contributed excess building materials from the palace. Additionally, members contributed loans with low or no interest and other institutions, such as Riddarhuset, also did their bit.²⁹ One of the most important donors was the merchant and high-ranking trade official Claes Grill, who was also a member of the Academy. After the Academy of Sciences received the almanac monopoly in 1747, that income was also used to complete the observatory.³⁰

A FEW YEARS AFTER THE OBSERVATORY'S COMPLETION in 1753, the Academy's administration moved to a rented room on Stora Nygatan in Gamla stan, the Old Town of Stockholm. By the summer of 1764, members were no longer able to meet in Riddarhuset and eventually moved their meetings to the Gamla Bancohuset building on Storkyrkobrinken, in the north of Gamla stan. However, in 1771, the administrators and meeting rooms moved together, into the Braheska building. They had rent-free access to five rooms that had housed the National Library before it moved to the Royal Palace. The premises were so big that there was enough space for equipment and specimen collections, even if some instruments had to remain

at the observatory. Later, another four rooms were used as almanac offices. However, it was not entirely cost free, because the Academy had to pay 17,500 daler in copper coin to renovate the worn-down premises.³¹

A few years later it was time for another move, as the royal court needed the Braheska building for other purposes. This was a disappointment for the Academy, which had moved in barely seven years previously. However, these constant moves appeared to have led to the realisation that a more permanent solution was necessary. As a way off this carousel, a member donated 150,600 daler in copper coin – one of the biggest donations the Academy had yet received – which could be used to purchase a house in the city. It transpired that there were several options, and the debate was stormy. In the end, the choice was the Schönfeldt Palace, also called the Lefeburska building, at 30 Stora Nygatan in the west of Gamla stan, despite the Academy's main architect condemning its location as “amid the busiest city”, with unsound environs and dark rooms.³² Founder Anders Johan von Höpken was the one who finally pushed through the purchase. But it was expensive, because the building's owner refused to haggle. Using the donation and the Academy's own contribution of 120,000 daler in copper coin, an amount that was more or less equivalent to three years' income from the almanac monopoly, the Schönfeldt Palace was secured for the Academy of Sciences, which assembled there from 1779.

You could say that this was just in the nick of time. The Academy of Sciences had begun to amass quite extensive collections of instruments, specimens and books, which naturally required a more permanent home. The first scientific equipment and instruments had been constructed for the new observatory in the mid-18th century. The collection was soon expanded in association with the Thamic lectures – public lectures organised by the Academy of Sciences, starting at the end of the 1750s. Collecting activities for a natural history cabinet had started earlier than this. The Academy of Sciences was also quick to house a library; basically a book collection. Throughout the 18th century, and particularly in the 19th century, three primary collections expanded under the care of the Academy of Sciences: the instrument collection, the natural history collection and the library.

When physician and scientific traveller Anders Sparrman was employed to manage the expanding botanical collections in association with the move to the Schönfeldt Palace in Gamla stan, he became the first curator of the natural history cabinet, coinciding with the spatial opportunities the new building provided for developing activities. This context effectively demonstrates the intimate links between material collections, buildings and organisational growth, and a pattern of development can be discerned, starting with the founding of the observatory, when a collection of instruments, equipment or specimens needed a building so they were not dispersed or

destroyed. In the decades prior to the move to Stora Nygatan in Gamla stan, in 1779, the collections of minerals, plants and mounted or otherwise preserved animals had become quite intrusive. Once the building was available, it was not only possible to exhibit the collections but also to employ staff on a more permanent basis. Also, in the Schönfeldt Palace on Stora Nygatan, a physical cabinet was soon installed, with instruments placed in cupboards with glass doors. There were mainly the private collections of Johan Carl Wilcke, a professor of physics, which were used at the Thamic lectures.³³

PROCESSES OF THESE TYPES do not always follow the same order. Sometimes the staff and collections come before the building, sometimes the collections and building come before the staff. But, once there is a building, it is possible to expand the collection, which in turn creates a demand for more staff to care for the new items that have been collected.

Just a few years after the Academy of Sciences had purchased the Schönfeldt Palace, it received its largest yet donation, which specifically included property totalling seven hectares. This was Bergielund, owned by brothers Bengt and Peter Jonas Bergius. It was bequeathed to the Academy of Sciences in 1784, with the will's validity was confirmed by the Svea Court of Appeal in February 1791.³⁴ However, the land and buildings were not transferred directly to the Academy of Sciences. Instead, the Bergius Foundation was established to manage and run Bergielund and to support research in natural history, primarily botany, by creating the Bergianus professorship. The Bergius Foundation has been part of the Academy of Sciences since 1791, but it has separate finances and governance. The Bergius property not only had fruit trees and fixtures, it also had the magnificent Bergius Library and transcript collection until 1831, when this was moved to the library of the Academy of Sciences.³⁵

After almost twenty-five years in Gamla stan, the Schönfeldt Palace began to be too small. Once again, it was primarily the expanding collections of specimens that needed more space, but the library also needed larger premises, as did the increasing numbers of staff necessary for ordering and maintaining the collections.³⁶ A significant reorganisation of the premises from 1804 was conducted to produce more space for the specimens and books. The idea was that this would be adequate for many years to come.

This worked for almost twenty years, but in 1822 the Academy capitulated, and admitted the need for larger premises for a national museum.³⁷ Complaints about cramped conditions were a regular occurrence over the following five years. One reason was the expansion of the library – a consequence of the 1810 decision to collect all new Swedish publications – but a more pressing reason was the major specimen donations from Gustaf von Paykull and Adolf Ulrik Grill, as well as the significant influx of assorted animals,

insects, rocks, shells and other objects that are described in more detail in chapter 5.

As is apparent, one important aspect of the Schönfeldt Palace was that it housed instrument and equipment collections, as well as natural history collections and a library, phenomena that comprised tangible frameworks for activities, creating an almost inexorable path dependence. This may not initially have been noticeable, when the collections were small and relatively easy to move. But as they grew and required more storage space, their significance as a framework for activities increased. Lectures and investigations were dependent on the available material. Purchasing new equipment was not only expensive, it also placed extra strain on the already limited space. Eventually, large collections also become fairly expensive to maintain as they require increasing numbers of staff, also entailing a need for even more space. There are many occasions in the history of the Academy of Sciences on which expanding collections and their staff have outgrown their premises. Just as buildings are constructed in specific circumstances and are often initially adequate and well-adapted, instrument and equipment collections are often suitable for research or teaching when they are created. However, as they expand and age, like buildings, they become less and less relevant to activities and, finally, can simply become a burden.

THE ACADEMY SOLVED THE PROBLEM of the Schönfeldt Palace's inadequacy in October 1828, thanks to a proposal to buy the Westmanska building. This was further north, between Drottninggatan and Adolf Fredrik Church, just below the observatory on its hill. The building was considerably more spacious than the one in Gamla stan and also lay on land that could be used for future expansions. The Academy moved all the collections and other property there in the autumn of 1829; this would have been an extensive operation, prior to reopening the Swedish Museum of Natural History to the public in 1831.

Initially, the museum had around a hundred visitors per day, but five years later this number had slumped to around ten visitors per day.³⁸ The lowest point came in 1848, with only 1,400 visitors over the entire year. In other words, the new Swedish Museum of Natural History was not the bellows for circulating knowledge of natural phenomena among the capital's residents that the Academy of Sciences and other stakeholders had hoped for. The entrance fee was eventually reduced to 25 öre and visitors once again flowed in, not least on Saturdays when admission was free.

Further expansion in the area was soon being discussed, but the expense was a barrier. The Academy of Sciences was not able to buy neighbouring land until 1846, using remuneration from the state in the form of an annual grant, supplementing the one normally received by the Academy for activities

at the museum.³⁹ After an agreement with the Riksdag and the City of Stockholm, the Academy's landholdings could be further increased a few years later at no great cost. In the mid-1850s, the Academy developed plans for new construction on this expanded acreage and, because half the cost of construction was awarded as a grant from the Riksdag, work began at the start of the 1860s.⁴⁰ The Riksdag also awarded funds for the restoration of the old buildings, with a new and larger national museum of natural history, which opened in 1866.⁴¹

The Riksdag's willingness to take responsibility was because the Swedish Museum of Natural History had increasingly become a state issue in the 1840s, even though it continued to be managed by the Academy of Sciences. The public goodwill surrounding the museum's expansion can be understood against the backdrop of the 19th century, which was something of a golden age for museums, both on the continent and in Sweden, particularly in Stockholm. Towards the end of the 19th century, more museums were founded to promote the circulation of knowledge in various fields. In the capital, the main additions were the National Museum of Art in the 1860s, Skansen and the Biological Museum on the island of Djurgården in the 1890s, and the Nordic Museum a few years after the turn of the century. But at the start of the 20th century, the Museum of Natural History remained one of the most popular, beaten only by Skansen and the National Museum of Art.⁴² Compared to the situation just over fifty years previously, visitor numbers were now many times higher – in 1904, as many as 24,600 people saw the zoological collections.⁴³ The way the Museum of Natural History became one of the Academy's most important public activities during the 19th century can be seen as a clear expression of institutional uniformity; it assumed forms, those of the exhibitions, that recurred in other fields, such as art or preservation.

It should also be said that, from 1890, the Museum of Natural History primarily appealed to younger visitors. This was also a relationship that was carefully utilised by organising school visits and ensuring the museum was accessible and attractive to the whole family. Another factor that probably contributed to simplifying negotiations with the Riksdag about the generous funding for expansion in the 19th century was that the Academy of Sciences, along with the universities in Lund and Uppsala, had representatives in the Riksdag's clergy estate from 1828 to 1866.

In the early 1870s, six years after the Swedish Museum of Natural History re-opened in 1866, another land purchase was on the table at the same time as state funding for the museum increased sharply.⁴⁴ However, this time almost eight years passed before the Riksdag discussed funding for construction on the land, despite the Academy repeatedly emphasising the need for expansion. This was the origin of a long and difficult discussion that has entered



THE COLLECTIONS OF SKELETONS at the Swedish Museum of Natural History attracted the interest of early magazines. Woodcut after a drawing by Carl Svante Hallbeck.

the history books as the issue surrounding the Museum of Natural History's buildings.

It took until 1883 before the Academy of Sciences' proposal for construction funding was used basis for a bill that was discussed in the Second Chamber

of the Riksdag the following year. Here, one member maintained that the land, because of its central location, was too valuable for a museum and that it would be better to move the Museum of Natural History further out of the city. If this was done, the value of the vacant land could be used for a new building, one big enough to house the constantly expanding collections. Others opposed the idea because they assumed it entailed moving the Museum of Natural History, while the Academy of Sciences would remain in the Westmanska building, which they felt would be an inappropriate divorce. At any rate, the result was that the Second Chamber rejected the bill. There was to be no expansion this time either.

IN THE MID-1880S, the Bergius Garden moved from Bergielund to Frescati, on the eastern shore of Brunnsviken, a bay to the north of the city where more land was available. Selling Bergielund and purchasing the land in Frescati from the king dramatically increased the size of the garden, from 14 to 48 acres. Two years later, in 1887, an internal enquiry at the Academy of Sciences proposed that the entire Museum of Natural History should follow, collections and all. However, this did not occur at that time. Frescati was just too far away, despite the recent opening of the narrow gauge *Roslagsbanan* for rail traffic from Stockholm, through Frescati, to Rimbo.⁴⁵ Additionally, the street of Drottninggatan was the main axis of Stockholm's knowledge centre in the late 19th century, with numerous higher education institutions, from the square at Hötorget up to the observatory on Brunkebergsåsen. Like a string of pearls, below it stretched Stockholm University College, the College of Mining and Metallurgy, the Academy of Agriculture, the Institute of Technology, the Institute of Pharmacology, the Norra Latin and Nya Elementar secondary schools, the Geological Survey of Sweden and a nearby museum of geology.⁴⁶

Still, throughout the 1890s there were regular attempts to lobby the King in Council and the Riksdag to, if possible, gain approval for additional extensions to the Museum of Natural History. However, even if the need was recognised by the standing committee, no new funding was granted for construction. One point of contention was whether the solution to this issue required a move or whether new buildings on the existing land were adequate for storing existing collections, in the same way as earlier in the 19th century.⁴⁷

TABLEAU OF THE STAFF at the Bergius Gardening School in 1899, under the direction of Veit Wittrock. ►

MAP OF THE BERGIUS BOTANIC GARDEN prior to its move to Frescati in 1885. At that time, the garden was located between what is now Karlbergsvägen and Vasaparken.

Kongl. Vetenskaps-Akademiens

Bergianska Trädgårdsskola

1899.

V. WITTRÖCK



N. H. LINDSTRÖM



C. FLORIN



P. O. JOHANSSON



J. F. REHNSTRÖM



J. G. JOËLSSON



G. G. LJUNGQVIST



G. BOREN



J. PERSSON



K. JANSSON



E. O. ROSEN



G. H. SYREN



J. JOSEFSSON



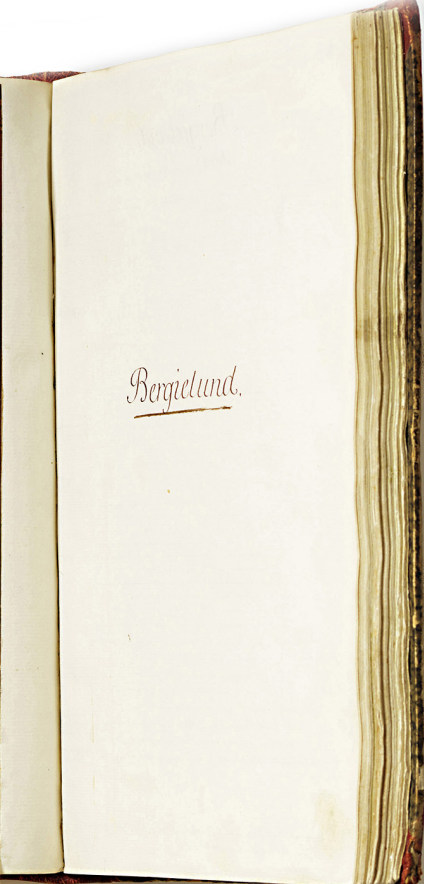
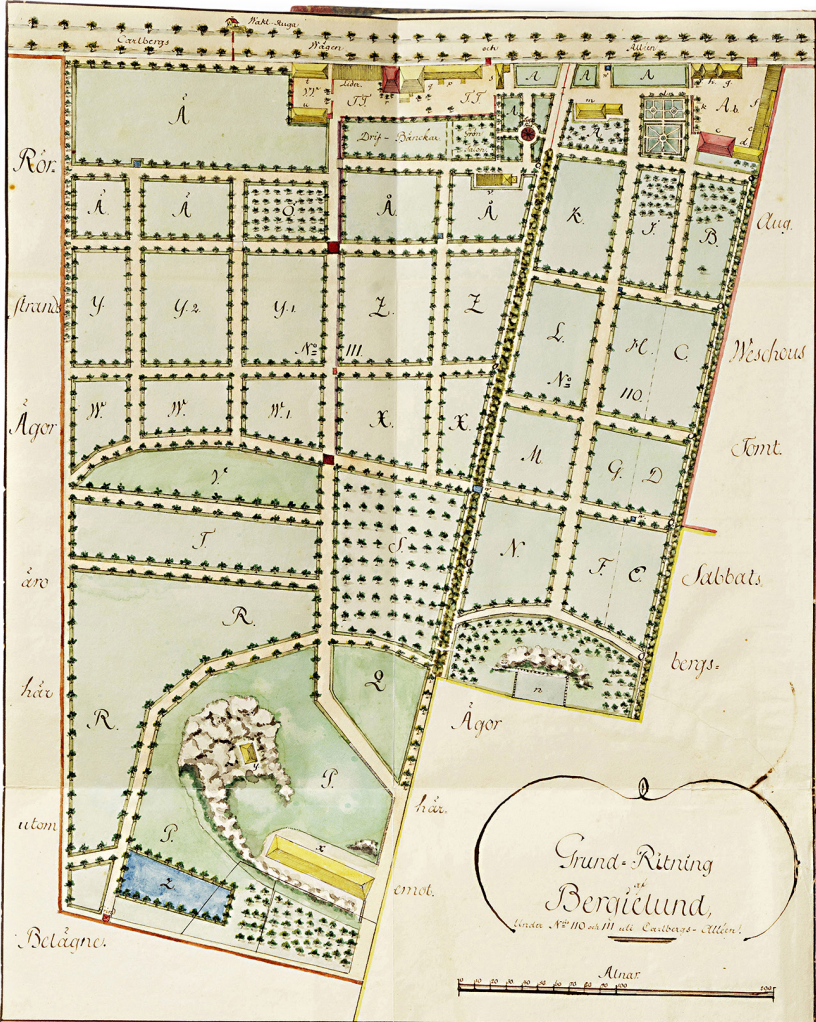
H. AUSTRIN



Gåva till FÖRENINGEN

BERGIANARE av framlidne G. G. Ljungqvist

*S. Larsson
Kgl. Hoftryckeriet
Stockholm*



Kännetecknens betydelse.

<p>A. Öfre Gården med de 3 ädgnad på Öfre Tomten N:100</p> <p>c. Boningshus af sten, 2 våningar högt, hvaruti Boksamlingen förvaras och Botaniska besjessorn nu bor</p> <p>d. Materiad. Hus e. Magasin-hus f. M.a. bod g. Gård h. Käm. Åkeriska utetvård</p>	<p>J. Trädgården k. Ekodlare med förlusa l. En med stenmur försedd tvärrör vid källan m. Tränne tillä Kläckas af hvarika den nästna gården. Kallvatn emellan båda tvärrörerna.</p>	<p>K. Nedre Gården med ädgnad på Nedre Tomten N:111 n. o. g. Tränne Boningshus af trä o. En till Meschous. In. Byggnad af trä</p> <p>L. Läckgård med ädgnad l. Hus och Tränne n. Tränne-lada o. Tränne-lada</p>	<p>Trädgården Tränne-lada Tränne-lada Tränne-lada</p>
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*Denne Gård och Tomt innehåller 26,731 åker 3 Land 13 kversting
 208 689 Sade Run eller 14 Tomter och 27 1/2 Kvarter*

Anyway, because of the extensions and renovations in the second half of the century, the collections, activities and premises of the Academy of Sciences and the Museum of Natural History had become so mixed and conjoined that they had come to be regarded as identical, despite one being a private collection and the other a collection that had been in public ownership since 1849. To further complicate matters, the same premises housed academy institutions with state funding, such as the Central Meteorological Office.

This process clearly shows the path dependence of the buildings issue during the 19th century. In the 1840s, one solution to the problem of managing the growing collections had been to purchase neighbouring plots of land and extend the building. Once this solution had proven successful, the Academy of Sciences had attempted to repeat it several times over the 19th century. It was used time and again to try to stave off the problem of the expanding collections requiring more and more space.

AT THE START OF THE 20TH CENTURY, discussions continued about the issue of buildings for the Academy of Sciences and the Museum of Natural History. However, it became increasingly unrealistic to believe that the existing property beside Drottninggatan and the Adolf Fredrik Church would suffice. A larger area was needed to house the collections and other activities.⁴⁸ The problem generated a whole series of inquiries and a number of proposals for land in the northern areas of the city. Finally, the decision was made to build in Frescati, south of the Bergius Botanic Garden, an idea that had been around since the 1880s. The Academy of Sciences was at last able to move into new premises at Frescati in 1915, a few hundred metres from the magnificent new buildings of the Museum of Natural History, which covered almost 20,000 square metres.⁴⁹ In this context, the Academy had tried to purchase the title registration for the area from the Bergius Foundation, which was prevented by the Office of the Attorney-General more than once, because the Academy already owned the land and the foundation could not be regarded as an independent legal person.⁵⁰ This led to severe limitations on the Academy's direct ownership of land in the area.

The cost of the new national museum was almost four million kronor, including its fittings with gigantic cabinets and exhibition cases, about one-third of which was covered by selling the old property of the Academy of Sciences and the Museum of Natural History on Drottninggatan to the City

THE BUILDING FOR THE SWEDISH MUSEUM OF NATURAL HISTORY in Frescati was designed by the Academy of Sciences' architect Axel Anderberg and constructed between 1907 and 1916. In the picture, workers are constructing the cupola that crowns the building.



of Stockholm. However, the new museum, an associated whaling museum, premises for the Geological Survey of Sweden and the move itself were primarily paid for by the King in Council, pursuant to a decision by the Riksdag.⁵¹ The cost of the Academy of Sciences' new building, including fittings, was mainly met using money obtained by the Academy after the King in Council had bought the remaining property on Drottninggatan, where the ethnography department of the Museum of Natural History, which had been established in 1900, was to remain.

The move proved to be a success for the Museum of Natural History, at least initially. People flooded in when the doors of the new building were opened and, during the first full year in Frescati, 1917, 72,000 visitors were registered. This made the Museum of Natural History the second-largest museum in Sweden, beaten only by the National Museum of Art and Design. Visitor figures remained fairly constant throughout most of the 20th century, with 83,000 visitors in 1966, the year after the museum was hived off from the Academy of Sciences, becoming a public museum under the Ministry of Culture. However, in comparison with other Stockholm museums, this meant that the Museum of Natural History lost a great deal of its attraction power. Skansen, the National Museum and the Nordic Museum were doing significantly better.⁵² But many visitors were also going to museums that opened after the Museum of Natural History had moved, such as Moderna Museet, the National Museum of Science and Technology and the Maritime Museum.⁵³ There is no doubt that the Museum of Natural History lagged behind in the competition for the capital's museums in the 20th century, even if visitor numbers remained stable in absolute terms.

The attraction of the Museum of Natural History was probably the combination of singularly amazing objects – every kid in Stockholm knew how to find the display with a two-headed calf – and the overwhelming number of objects, with an astounding variety in every field, from rocks to butterflies on pins. The issue was keeping balance; making the exhibitions entertaining while describing how nature should be categorised and understood. In the best case, the museum succeeded in both educating and entertaining. Which of these should come first was endlessly discussed, not least because an important aim was outreach to children and young people. The high visitor numbers also meant that the Museum of Natural History confirmed the popularity of the natural sciences. At the same time as visitors learned more about nature, the museum staff learned more about the popularity of natural history among each new generation. This is also a type of knowledge circulation.

EVEN IF THE ACADEMY OF SCIENCES and the Museum of Natural History had moved slightly north of the city, the buildings were not isolated. As mentioned, the *Roslagsbanan* railway passed close by, and the Bergius Botanic

Garden had been in Frescati for more than thirty years. Not far from the Academy's Frescati building, on the other side of the winding gravel road known as Roslagsvägen, was the Swedish Central Agricultural Experiment Station, a public institution that had taken over the activities of the Academy of Agriculture's experiment fields in 1907.⁵⁴ The Academy of Agriculture's more than decade-old fishery and agricultural museum was also located here, as was the Nobel Institute for Physical Chemistry and, a few decades later, the Nobel Institute for Physics. It was not for nothing that the area around Frescati was launched as a "science city", and the move coincided with a campaign to create an entirely new part of the city dedicated to science in the area by the Bergius Botanic Garden.⁵⁵ (Science City is a concept that is still being exploited as regards Stockholm University and Karolinska Institutet, on the other side of Brunnsviken.) Even today, the Bergius Botanic Garden, the Royal Swedish Academy of Sciences and the Swedish Museum of Natural History are all within walking distance of each other. However, the Academy of Agriculture's fishery and agricultural museum has become a student dining hall, because most of Stockholm University moved here in the 1970s.

As regards the issue of the Museum of Natural History's buildings, the standard solution of purchasing neighbouring property and extending the existing buildings no longer appeared possible after the collections had expanded excessively. It also seems that the move to Frescati was facilitated by the Bergius Botanic Garden leading the way and already being on site, along with several other knowledge organisations, and, not least, that there were good rail links. Somehow, in retrospect, it can seem obvious that the Academy of Sciences would move to the new Science City. But this was not the case in the early 20th century, when there was contention about where the Academy was to construct its new building.

The spread and the flora of buildings for which the Academy of Sciences was either responsible or owned increased fairly dramatically in the 20th century, with the various research stations that were established in Sweden and abroad. The first was founded toward the end of the 19th century: Kristineberg Zoological Station on the Swedish west coast, which is described in more detail in chapter 5, was established in 1877. It was followed by the Abisko Scientific Research Station in 1912, which came into the Academy's ownership in 1933. At the end of the 1940s, the Academy of Sciences also established a geophysical observatory outside Kiruna, initially in a fairly temporary and informal construction, but with organisational forms that became more fixed during the 1950s. This process is described in more detail in chapter 6. The Research Station for Astrophysics, on the Italian island of Capri, was another establishment that demonstrates how the Academy's building mass became increasingly diversified and dispersed in



ESSAY

What the water-colourist did not know
p. 460–467



MATHEMATICIAN GÖSTA MITTAG-LEFFLER in his villa in Djursholm. The words on the mantelpiece are a play on the Swedish word *talet*, which could mean either speech or number, and say: “Speech/Number is the beginning and the end of thought. With thought, speech/number is born. Without speech/number, thought goes nowhere.” In this context, this motto refers to the language of numbers, rather than that of words.

PHYSICIST AND CHEMIST SVANTE ARRHENIUS photographed in his laboratory at the Nobel Institute in Frascati in 1926. An unidentified colleague stands beside him.

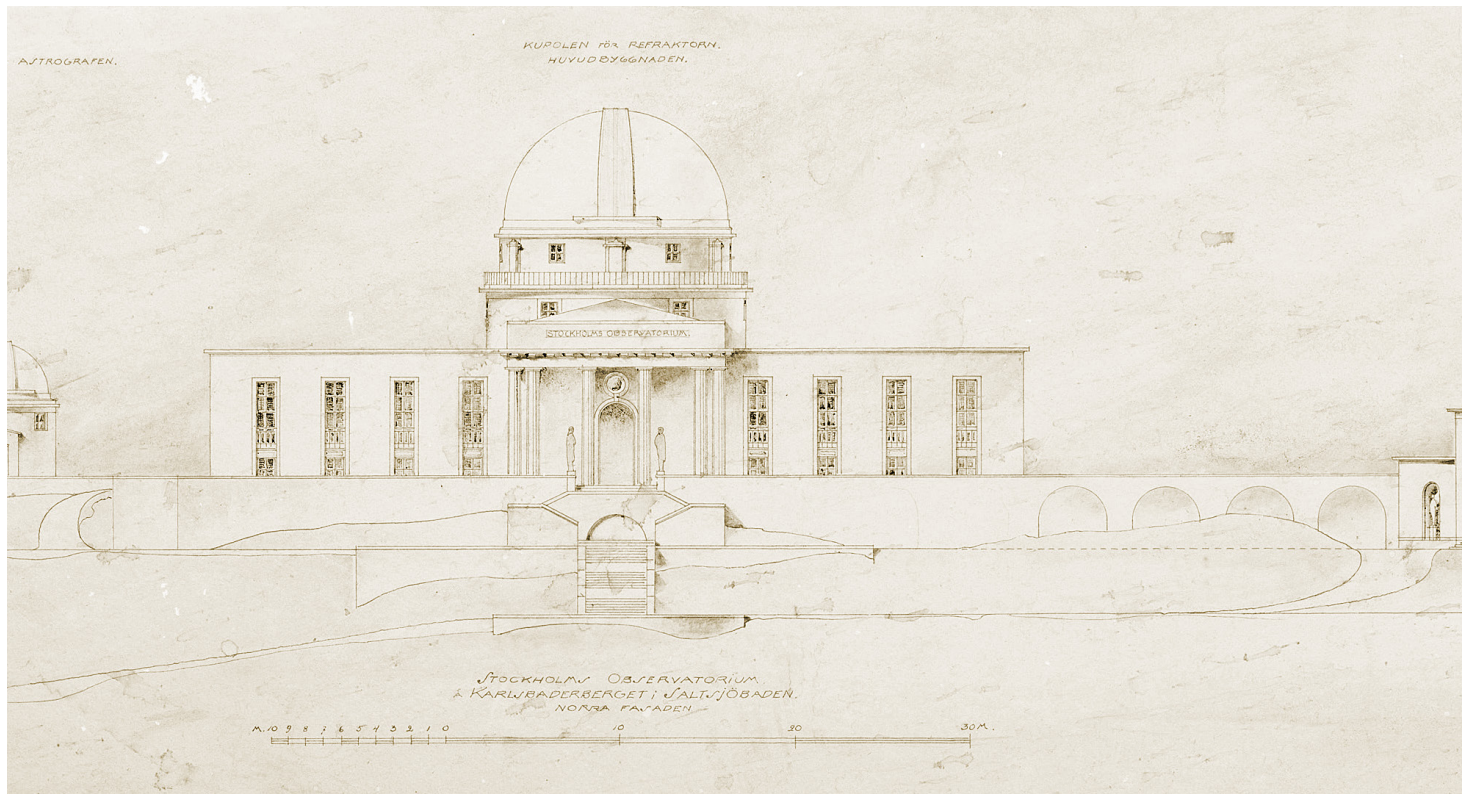
the 20th century. This station was founded in the early 1950s, when the physician and cultural figure Axel Munthe donated his Villa San Michele to the Swedish Institute in Rome.⁵⁶ Here, scientists and noted cultural figures were able to stay in charming surroundings, conduct relevant research and promote and strengthen Swedish-Italian cooperation.

ANOTHER CATEGORY OF BUILDINGS with direct links to the Academy of Sciences was the Nobel institutes, a consequence of the Academy being tasked with deciding the recipients of the Nobel Prize in accordance with the



will of industrialist Alfred Nobel in 1897. One reason for establishing the Nobel institutes was to review the proposals for laureates, which is covered in more detail in chapter 5. The first Nobel institute at the Academy of Sciences was founded in 1905, in physical chemistry, with Svante Arrhenius, Nobel Laureate in Chemistry, as its director. From 1909 he was able to work in a separate building that, some years later, lay a few minutes' walk from the Academy of Sciences' new building in Frescati, once it was completed in 1916.³⁷ After Arrhenius' death in 1927, its activities stood still and, in 1933, the Nobel Institute for Theoretical Physics was established in the premises instead. A few years later, a Nobel Institute for Experimental Physics was built a stone's throw north, under the management of Manne Siegbahn, Nobel Laureate in Physics.

The Nobel institutes may also have inspired the embryonic mathematical research institute, with its building and extensive mathematics library, created when Gösta and Signe Mittag-Leffler bequeathed all their possessions and their private residence, Villa Mittag-Leffler in Djursholm, to the Academy of Sciences in 1916. However, a great deal of this fortune was lost in the early 1920s and, in 1927, when Gösta Mittag-Leffler died, there was



THE NEW OBSERVATORY for the Academy of Sciences was built on Karlsbaderberget in Saltsjöbaden in 1929, and designed by Axel Anderberg (who had also, fifteen years previously, designed the main building for the Academy of Sciences in Frescati and the Swedish Museum of Natural History). The observatory opened in June 1931.

no longer enough money to realise his ideas for a research institute in mathematics. The house was instead used as a private residence and mathematics library, with only a few lectures. Their plans had to wait until 1969 to come to fruition, when a research institute was founded for visiting researchers and other activities.

On the whole, what happened was that investments by the Academy of Sciences to promote research were often realised through the establishment of relatively independent research institutes, with the Nobel institutes as an important source of inspiration. The consequence was that resources were allocated to different research stations that had fairly large areas, both in terms of their research and their geography, demanding increasing resources

in terms of instruments, staff and buildings. By the mid-20th century, the Academy of Sciences' buildings were no longer only in Stockholm.

As regards the Academy's first observatory, which remains in Stockholm, on Observatoriekullen at the top of Drottninggatan, its location in the north of this growing city became increasingly unsuitable, given all the light sources that interfered with observations. It was completely outdated by the end of the 19th century, if not before.⁵⁸ The situation became more critical after the Academy moved north to Frescati and during the 1920s. In 1926, the *Populär Astronomisk Tidskrift* [Journal of Popular Astronomy] published an appeal by Nils Nordenmark for the construction of a new observatory. This enticed the financier Knut Wallenberg to make a major donation towards a new building east of the city, outside Saltsjöbaden, where, a few decades previously, he had created a garden suburb and bathing resort for the wealthy, with hotels, rail links to Stockholm city centre and other conveniences.⁵⁹ The idea was also discussed by the Academy in 1926, when Vilhelm Carlheim-Gyllensköld lectured on "Om akademiens observatorium" [On the Academy's Observatory].⁶⁰ Incidentally, that year celebrated the 350th anniversary of Tycho Brahe's renowned observatory on the island of Ven, in The Sound between Sweden and Denmark, featuring a jubilee and wreath-laying on behalf of the Academy of Sciences, something that may have encouraged donations for a new observatory in Saltsjöbaden.

The move to the newly built observatory took place in 1930 and 1931. The inauguration in Saltsjöbaden was in June 1931, in the presence of the king and many other dignitaries.⁶¹ New observations began in August, continuing successfully throughout the autumn thanks to favourable weather.⁶² Meanwhile, the Academy sold the old observatory on Observatoriekullen to the City of Stockholm. The geography department of Stockholm University College was housed here until the 1980s, after which the question arose of what the city should do with the building. The Observatoriekullen Foundation was formed by the Academy of Sciences, the Academy of Letters, Academy of Engineering Sciences, Uppsala University, Stockholm University, the Royal Institute of Technology, the Museum of Natural History and the National Museum of Science and Technology, in order to create a museum for the history of science. Accordingly, the Observatory Museum opened in 1991.⁶³ In 1999, the observatory returned to the ownership of the Academy of Sciences and, a few years later, the museum was merged with the Center for History of Science. However, the Observatory Museum was mothballed in 2014 and the building was sold to the City of Stockholm in 2018.

A SIMPLE INITIAL OBSERVATION about buildings is that the Academy has stayed put for longer and longer periods after each move. In its first premises, at Riddarhuset, members met for 25 years before having more

ambulatory circumstances for the subsequent 15 years. However, from 1779, the Braheska building on Stora Nygatan was the fixed point for 49 years. After the move to the Westmanska building on Drottninggatan, the Academy remained there for 87 years, until 1915, when it moved to its present premises in Frescati, north of the city. After every move, the Academy seems to have stayed almost twice as long as at its previous home and, if that rule of thumb applies, the next move should take place sometime around 2075. Also, if one is bold enough to put emphasis on how the Academy has moved further and further north, then property in the south of Täby, a suburb to the north of Stockholm, has potential in the future.

On this basis, the cancellation of the possible 2012 move by the Academy of Sciences to the planned Nobel Centre, a controversial newbuild in Blasieholmen in central Stockholm, to which the Nobel Foundation and Nobel Museum are intended to move, should come as no surprise. Discussions were due to the ongoing losses made by the Academy: in 2011 they were twelve million kronor, of which nine million were due to the cost of its premises. Naturally, this was not good for the Academy's balance sheet. A move could have created a positive balance if the premises at Frescati were sold or leased out.⁶⁴ Still, this time there was to be no relocation and the management of the Academy instead had to produce a plan for reducing the cost of its current premises.⁶⁵

Economy

The principle is that an organisation with good management increases the value of its assets. However, the result, in the form of a good economy, has no value in itself; it simply enables the maintenance of investments and support for new initiatives that are deemed important and fit the purpose of the organisation. As regards the Academy of Sciences, its resources have been used in many different ways. This has involved supplementing and expanding collections through purchases and, in equal measure, paying the staff that look after them. Funds have also been used to renovate and rebuild premises when they suffer wear or become unsuitable for activities. Over the years, the Academy of Sciences has been more than happy to invest in exploration and research expeditions, or in establishing research stations or laboratories.

In an assembly of scientists, all of whom are passionate about their own subject, whether it be the entomology of the New World or photographic astronomy, no amount of money will cover everyone's needs and wishes. In other words, the Academy of Sciences has always suffered from a lack of resources, no matter how good its results and how strong its balance sheets. There are also significant uncertainties that make management more difficult: How should the balance of risk and growth be determined when investing