REFLECTING TELESCOPE made by James Short and used at the observatory in Stockholm.

Power and the observatory

Sven Widmalm

The note on Elias Martin's ink wash painting says that it depicts "The observatory seen from Tullportsgatan". The picture's date is unknown, and the observatory undeniably looks fairly modest compared with the more widely known print of the balloon launch in September 1784. Perhaps it was under construction, which would date the picture to the start of the 1750s, making it the barely teenage Martin's earliest known Stockholm picture.

These pictures exemplify two aspects of the observatory's importance during the 18th century. The powerful elite, headed by the royal couple and other apparently enthusiastic sections of Stockholm society, participated in the balloon launch, which was one of several occasions when the observatory was the focus of the public's eye, functioning as an arena for the political and scientific display of power. In Martin's depiction, the observatory is indeed elevated, but it is not the dominant element of a grimmer Stockholm reality, one where the prominent buildings are modest timber, both literally and symbolically a long way from the shining building on the observatory hill – a perspective from below, in two senses.

Both pictures can be interpreted in terms of science policy: science appears to claim a place at the top of the social hierarchy. This was not least applicable to astronomy, which was able to benefit from a symbolically strong position as a link between the earthly and the celestial. The observatory's raised position in the cityscape was not just a scientific advantage (avoiding, to some

AN EARLY INK WASH by Elias Martin depicting "The observatory seen from Tullportsgatan".

BALLOON LAUNCH from the observatory in September 1784.

Den Aerostatiska Kulan, som upgeck från Observatorie gården i Stockholm den 17 September 1784.

på Kongl. Wetenskaps Academiens föranstaltande genom Professorn & Ridd. Joh. C. Wilcke;
K: G. III tid wänster med Kronprinsen; – Drottningen med Hofwet, som efter afklippandet af tråden, widare
upplystes af Prof. Wilcke om Ballongens egenskap, som war den tiden Montgolfiers uppfinning. Ballongen
sänkte sig på Wermdön och fördes i det tomma sidentyget till Staden af en förskräckt bonde.

extent, the view being obscured by smoke and dust), but could also be regarded as a mark of its cosmological and social significance.

Karin Sennefelt has investigated Stockholm's political geography during the Age of Liberty, 1719–1772; she highlights how different places manifested the political claims of various power constellations. This was also true of the observatory, which represented modern science's claim to an elevated social and political position. The observatory belonged to the Academy of Sciences and was its foremost architectonic manifestation during the years the Academy and the Swedish natural sciences in their entirety were supported by a close alliance with the political party known as the Hats.

The observatory was the single largest investment in natural science research of 18th century Sweden. By the middle of the century, the Hats were the dominant party and their support for modern science was so emphatic – natural science and technology were regarded as the cornerstones of economic growth – that it is reasonable to claim that this period was when Sweden first gained a consistent research policy. The Hats had already made major investments in science, including backing the construction of an observatory in Uppsala, although this was considerably smaller than the one to be built in Stockholm. Around 1750, there were investments in both an observatory in Stockholm and new professorships in physics and chemistry in Uppsala.

The observatory's inauguration in September 1753 was a manifestation of the happy union of political and scientific power. The highlight was when the Hats' chancery-president (prime minister is the closest modern equivalent) Anders Johan von Höpken, with the politically powerless royal couple among the audience, gave an oratorical performance of the type for which he had become famous. In his history of the Academy, Sten Lindroth approvingly quotes Pehr Wargentin's assessment that the speech was a masterpiece. Lindroth describes it as not simply a display of rhetorical brilliance, but also a superb celebration of the modern science represented by the new building. A closer reading of von Höpken's speech reveals, however, the contours of a political iron fist in a rhetorical velvet glove.

Von Höpken really was, as Lindroth writes, an enthusiastic advocate of scientific modernity and particularly praised how "*Philosophy* threw off its garrulity and clothed itself in a Mathematical garb". He maintained that science had grown strong due to the rising number of skilled researchers, but he also emphasised the importance of political and military leaders' increasing interest in supporting new ideas. In Sweden, this scientific flourishing led to domestic talent being able to assume responsibility for scientific developments, which was naturally, for a true mercantilist, preferable to the import of foreign intelligentsia that took place during the great power era. According to von Höpken, scientific progress was dependent on reciprocity in the

exchange between scientists and politicians. At the same time, there was no doubt about who had the greatest debt of gratitude to whom – as became apparent when von Höpken directly addressed the Academy members:

> Who have in such a brief time span enjoyed more blessings from the Powers that be, more grace from the Estates of the Realm, more care from the public, than ye have done? What have ye requested, that ye have not received, and how often have not such rich and plentiful benefits been awarded ye, that ye would not dare to wish them so great, much less demand them?

The message was clear: the success of Swedish science during the Hats' regime was thanks to the Hats' regime. The observatory was, said von Höpken, a shining example of how privileged Swedish science had become. And, while the Academy's members had performed their scientific tasks with no need to worry about anything other than their "calling", powerful benefactors had worked hard to realise the observatory project. Good manners forbade von Höpken from naming these people. Such benefactors wished to carry out their work in secret; their greatest reward was to see the scientific fruits of their self-sacrificing patronage.

Wargentin was to run the observatory and to ensure its anonymous benefactors were satisfied (which, in time, they were). One suspects that he understood his duties correctly when he, in an anonymous appendix to von Höpken's printed speech, actually revealed their identities. Gratitude demanded that their names were preserved for posterity, he wrote. According to Wargentin, their efforts were worthy of endless praise, for astronomy without a high-class observatory would be based on guesswork and "a country's felicity, which is based on *Oeconomie* and *Commerce*, should not be jeopardised by guesswork". So the chancery-president and astronomer thus formulated, as part of a rhetorical exchange, the harmonious cooperation between political and scientific power; they simply emphasised slightly different things – the former highlighted politics' importance for research funding, the latter science's importance for economically successful politics.

This cooperation was illustrated by the list of the observatory project's benefactors presented by Wargentin. It included his own predecessor, astronomer Pehr Elvius, as well as the nobleman and architect Carl Hårleman, who designed the building, nobleman and politician Carl Gustaf Tessin and the extraordinarily wealthy merchant Claes Grill – all prominent Hats.

Eight years later, the symbiosis between politics and science would again be manifested through a notable public spectacle, namely the observation of the transit of Venus across the solar disc. The event had long since been predicted and was the cause of lively activity among Europe's academies of science and, not least, their astronomers. The passage of Venus between the

Sun and the Earth in a manner observable against the solar disc occurs twice a century with an eight-year interval. The first transit of the 18th century was on 6 June 1761 and the second was on 3 June 1769. In principle, by measuring the times at which Venus entered and exited the solar disc from different locations on the surface of the Earth, it was possible to determine the distance between the Sun and the Earth. Using that measurement, all the other distances in the solar system could also be calculated. Scientific expeditions were dispatched in order to obtain as many measurements as possible at the greatest possible distances from each other. In Stockholm, they made a public spectacle of the measurements and invited both royalty and the political-economic elite to participate in the event which, according to Wargentin, also attracted "a perhaps too great a number of bystanders of both sexes and all estates" (which the astronomer had himself assured by announcing the event in the press).

The 15-year-old Prince Gustav was there with his mother, Lovisa Ulrika. Also present was mathematician Samuel Klingenstierna, first holder of the professorship in physics established by the Hats in 1750. But Klingenstierna was no longer in Uppsala. He had been tutor to the crown prince since 1756, following the queen's failed coup of the same year, with the complicated task of ensuring that he received a politically correct education, almost republican and definitely enlightened. Instead of dreaming of a re-established autocracy, Gustav was to dedicate himself to useful knowledge, which included both mathematics and astronomy. And the prince was aware that he had to show caution, as the attempted coup had ended with the torture and decapitation of eight leaders of the political group known as *Hovpartiet*, the Royal Court Party.

This was perhaps the last time that the observatory functioned as a political platform, with a subjugated monarchy as audience, to mark the accord between the Hats and modern science. When Venus once again transited the Sun in 1769, the Swedish astronomers' scientific achievements were again impressive, but there was no public spectacle at the observatory. The Hats' almost dictatorial position of power was collapsing; many of the leading figures were making approaches to the Royal Court Party which, three years later, would reintroduce autocracy under the leadership of the young king. The balloon flight in 1784 can be regarded as an expression of Gustavian cultural policy. It was the court, not the Academy, that initiated this manifestation. Its focus was not economically beneficial research, but a decorated hydrogen balloon carrying a cat.

⋆

The depiction of the relationship between astronomy and politics is partially based upon Sven Widmalm, "Science in transit: Enlightenment research policy and astronomy in Sweden", *The Journal of Astronomical Data*, vol. 19:1, 2013. A description of the observatory's origins is in Sten Lindroth, *Kungl. Svenska Vetenskapsakademiens historia 1739–1818* (Stockholm, 1967), vol. I:1, 378–393. For Elias Martin, see Michael Ahlund, *Landskapets röster: Studier i Elias Martins bildvärld* (Stockholm, 2011); for Stockholm's social and political topography, see Karin Sennefelt, *Politikens hjärta: Medborgarskap, manlighet och plats i frihetstidens Stockholm* (Stockholm, 2011), chap. 3. Prince Gustav's political and scientific education is covered in Marie-Christine Skuncke, *Gustaf III – det offentliga barnet: En prins retoriska och politiska fostran* (Stockholm, 1993), chap. II:1. The quotes are from Anders Johan von Höpken, *Tal till Hans Kongl. Majestät och Kungl. Vetenskaps Academien vid observatorii invigning den 20 sept. 1753* (Stockholm, 1753), 29, 36; [Per Wilhelm Wargentin], "Berättelse om observatorium i Stockholm", printed with von Höpken's speech, 44; N. V. E. Nordenmark, *Pehr Wilhelm Wargentin: Kungl. Vetenskapsakademiens sekreterare och astronom, 1749–1783* (Stockholm, 1939), 177 (translation from Latin in Wargentin's observatory journal).