

STAMP
OF THE ATOMIC
COMMITTEE



Modelling the atomic age

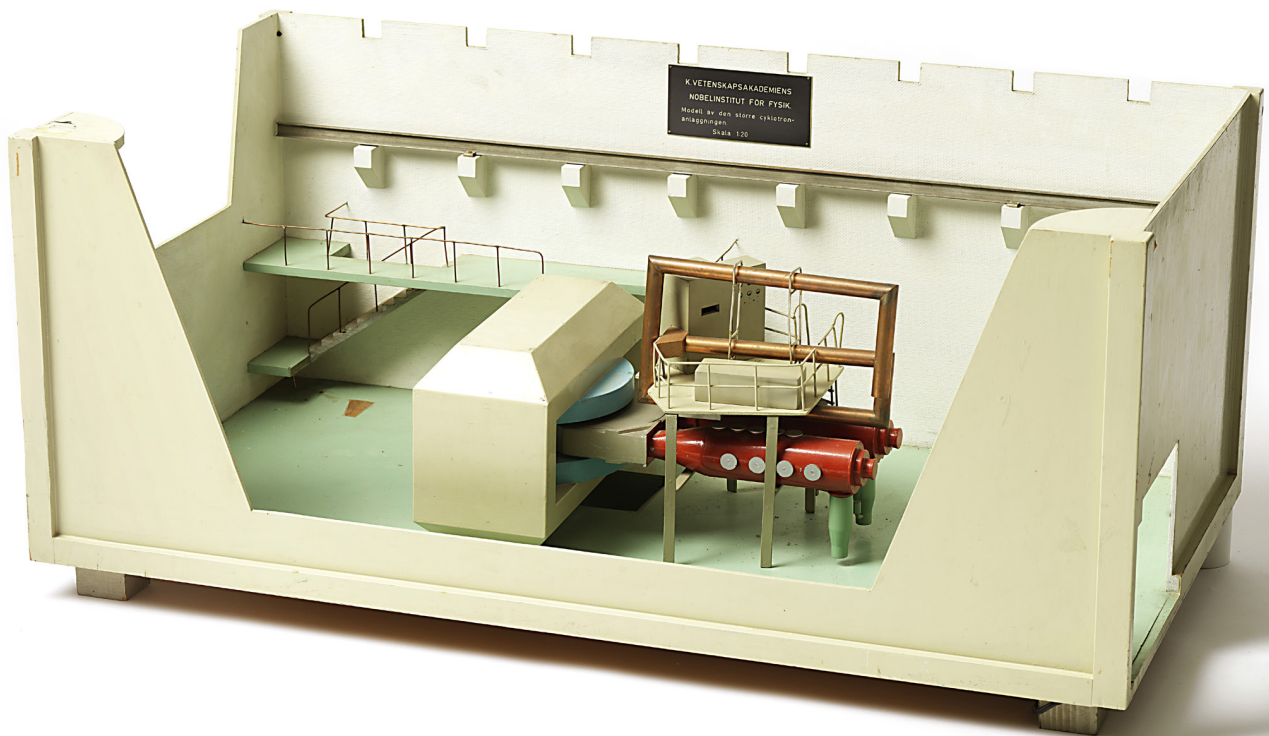
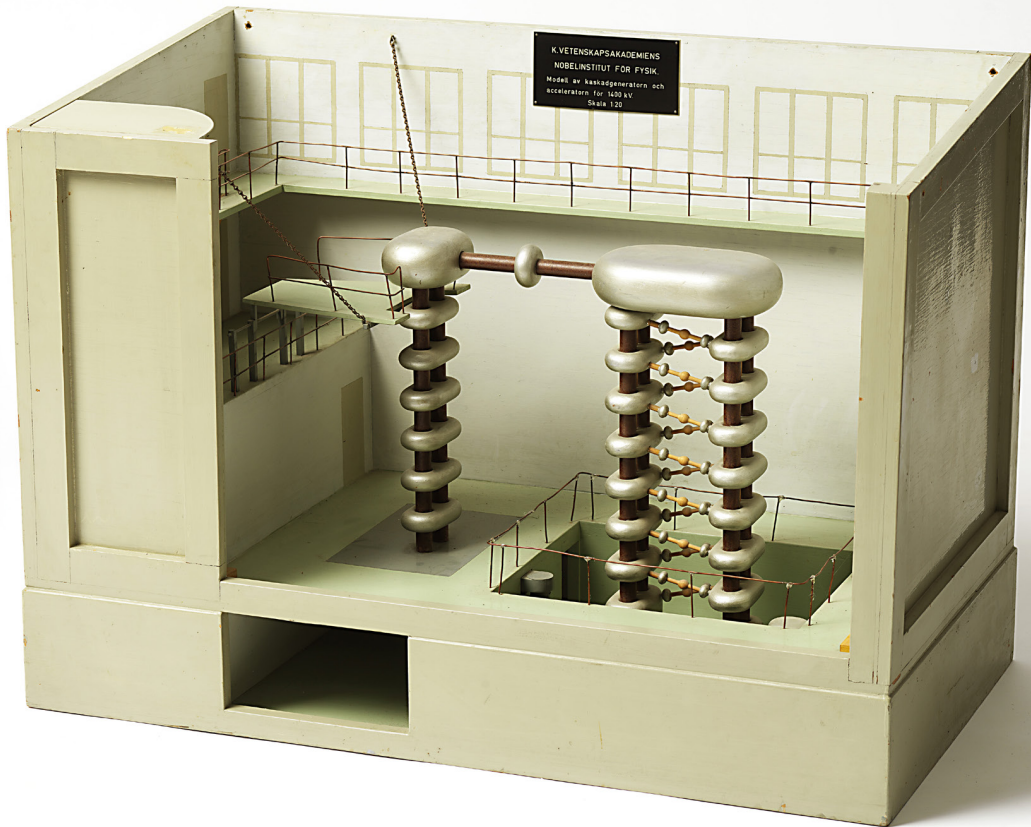
Karl Grandin

Since 2013, the scientific instrument collection at the Academy of Sciences has included two accelerator models from “the Nobel Institute for Physics at the R. Academy of Sciences”. One of the models is the “1400 kV cascade generator and accelerator” and the other is “the larger cyclotron facility”, both built at a scale of 1:20. There is also a third – interactive – model of the cyclotron that potentially illustrates how it worked. We will not examine the research performed with the two full-size accelerators – it is described elsewhere – instead we will focus on what the models’ purpose may have been: why and in which context were they constructed?

The two first models are built from wood, particleboard and protective glass, painted in shades of grey and pale green, and partially fitted with electric lights. The models came to the collection from a display in the cellar of the now-closed Manne Siegbahn Institute, to which the former Nobel Institute changed its name in 1988. They represent the two most important accelerators to have been used at the institute and were assumed to have been used in exhibitions or for teaching, unless they were made to persuade financiers, much like architects’ models of buildings. Because there was no accompanying documentation, and a range of enquiries provided no results, it has been assumed that the models were made when these facilities were in the news, i.e. at the end of the 1940s.

One potential lead was thus the renowned *Atomåldern* [Atomic Age] exhibition which, for three weeks in the spring of 1949, could be viewed in the halls of Osterman’s Marmorhallarna in central Stockholm. An exhibition

MODELS OF THE CASCADE GENERATOR and new accelerator that were under construction at the Manne Siegbahn Institute and which were displayed at the *Atomåldern* exhibition in the spring of 1949.





FILM POSTER for *Intill helvetets portar* (1948).

catalogue has been preserved, though the models are not mentioned there. However, continued research in newspaper coverage of the exhibition bore fruit: “Prof. Siegbahn’s giant cyclotron is portrayed in principle and as a model, his high voltage laboratory as a model”, could be read below the headline “Important news in Swedish research” in *Stockholms-Tidningen*, 12 March 1949. This was one of several reports from the newly-opened exhibition, and the professor in the quote was Nobel Laureate Manne Siegbahn (1886–1978), head and director of the Royal Academy of Sciences’ Nobel Institute for Physics and – important in this context – chairman of the exhibition committee for *Atomåldern*. The models were also mentioned in other publications, and not without national pride – look what Sweden is capable of! The Cold

War was at its height and nuclear technology was in focus, both military and civilian.

At the same time, Riksluftskyddsförbundet [the National Air Defence Association] distributed a brochure entitled “Are You Scared?” about “the opportunities for civil defence in the atomic age”. They wanted to “provide concise information on the effects of the atom bomb, as well as about its limitations”. At the same time, the Swedish blockbuster *Intill helvetets portar* [*Till the Doors of Hell*] (directed by Göran Gentele, 1948) was showing in Sweden’s cinemas. The film is about a Nobel laureate in nuclear physics, Professor Barring, who believes that a scientist’s task is the search for truth, even if it leads to the gates of hell. But after accidents at the institute and his son’s cancer diagnosis, he re-evaluates his opinions and ends his partnership with the arms industry, which also turns out to represent a foreign power. To prevent them kidnapping him and stealing his results, the professor blows up his entire institute in a planned accident. This mode of presenting issues relating to nuclear weapons and their consequences was typical of the time.

Even a month before the exhibition, “the story of nuclear power at a magnificent expo” could be read in *Aftonbladet* and, just before it opened, it was announced that the exhibition “is like a thrilling adventure film, captivating, bang up-to-date and a tiny educational masterpiece”. A few days later, it was possible to read that it “also shows, in general, how far Swedish research has come. A model of Prof. Siegbahn’s giant cyclotron, which is being built out in Frescati, gathers crowds of interested spectators.” Interest in the new nuclear power was extensive and fired up by the media. Radio was broadcast live from the exhibition and a publisher, Norstedts, chose to advertise a reference book, *Uppslagsbok*, using entries linked to the current theme. Over the three weeks that the exhibition was open, it attracted a total of 56,200 paying visitors. Films were shown every twenty minutes, an electron microscope was demonstrated several times a day, and there were varied lectures, both day and evening. It was an expansive exhibition of the most modern kind.

The exhibition opened in March 1949. The following day, readers of *Stockholms-Tidningen* could read about “the effects of nuclear power in clear, vibrant images” and how a delighted crown prince, who had opened the exhibition, announced that he “must see the exhibition again, thoroughly”. We can assume that one organiser, *Stockholms-Tidningen*, intended to use the exhibition to present itself as a modern publication that kept up with the burning issues of the day. The other organiser, the National Air Defence Association, was the precursor of the Swedish Civil Defence League and was perhaps primarily interested in discussions of whether and how it was possible for people to protect themselves against the bombs of the atomic age. Because of the central role of physicists in investments in both the peaceful

and military use of nuclear power, it comes as no surprise that the Swedish Physical Society – the third organiser – wanted to provide its perspective on developments in this area.

The idea of an atomic exhibition in Stockholm had been discussed in May 1948 by representatives of the Swedish Civil Defence Board, the National Defence Research Establishment and *Stockholms-Tidningen*. Their role models were two British exhibitions held the previous year – one in London, organised by the *Daily Express* newspaper, the other organised as a touring exhibition on rails, the *Atom Train*, by the British Atomic Scientists Association. Plans began to take shape that autumn, and a partnership on the exhibition's production was entered with a Danish company, Skandinavisk Udstillingskontor. Work started at Christmas.

The British material they were to take over was not designed the way they wished, so the Swedish exhibition was partly redone. A large number of Swedish and Danish scientists, and other specialists in various areas, were involved. The design was produced in Copenhagen by architect Ole Helweg in cooperation with *Stockholms-Tidningen's* representative. The exhibition's theme was chronological; it started with the discovery of radioactivity and ended with splitting the nucleus of a uranium atom. Visitors were thus taken deeper into the material step by step, which was primarily done using fluorescent "plastic models of great beauty". The second section depicted the war efforts to produce uranium-235 and plutonium, as well as the construction of the atomic bomb itself. Hiroshima was displayed in an "effective montage" with gramophone commentary, lighting effects and a picture series of the destruction, as well as from the tests on Bikini Atoll. After this, the exhibition moved to the peaceful, scientific use of atomic energy.

After its success in Stockholm, the exhibition moved to Gothenburg and Copenhagen. The idea was that it would also be shown in other places. At the same time, the British Atomic Scientists Association had decided to discontinue the *Atom Train* and transfer most of its props to the Danish-Swedish exhibition.

It not surprising that Siegbahn, who was chairman of the exhibition committee, had an interest in providing information about progress at his institute. This aim can be discerned in a text published the following year by the Atomic Committee – which allocated resources and led Swedish research and development work in the field: "Via the press and works of popular science, the basic facts about the problem of atomic energy should by now be well-known even outside circles of expertise." And, in this context, the models had filled an important role, showing Swedish progress in this both *factually* and *symbolically* important area. They were part of a context that promised a radical change in Sweden's power provision, with the potential for national autonomy, as well as the opportunity to produce a Swedish atomic bomb, if

this was necessary for continued Swedish neutrality. They had not reached the finish line, but they were confident, as evidenced by the Atomic Committee's text: "It may be objected that this form of writing history entails borrowing against future development, for no generator has yet used nuclear energy as a power source, but the indications that nuclear power will eventually be tamed, despite all the difficulties encountered thus far, are so strong that the risk of this history requiring correction in a few generations appears to be minimal."

In this day and age, such a successful exhibition would occupy plenty of space in the annual reports of the institutions involved, but it is not mentioned in the Manne Siegbahn Institute's annual reports, nor in the minutes of the Academy of Sciences or those of the Academy's Class for Physics. The concept of outreach activities had not yet been established, but people still had an interest in disseminating the message of the new age's hopes and circumstances.

In the spring of 1949, the public were therefore aware that they were living in the atomic age, and there were no significant protests about Swedish investment in a national nuclear power programme – these remained in the future. Interest was respectful and awe-filled. The participation of Swedish researchers in the era's frontline research was therefore a fact that attracted a "multitude of interested spectators".

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Someone who has studied similar subjects is Christoph Laucht, for example in "Atoms for the people: The Atomic Scientists' Association, the British state and nuclear education in the Atom Train exhibition, 1947–1948", *British Journal for the History of Science*, vol. 45:4, 2013. See also Magdalena Tafvelin Heldner, "Strumpstickor och pingpongbollar – med Tekniska museet i atomåldern", *Dædalus* 2008. Another relevant study, discussing how the atom was depicted at Deutsches Museum, is Christian Sichau, "Zwischen glänzendem Messing und abgenutzen Knopfdruckexperimenten: Das Atom im Museum", Charlotte Bigg & Jochen Henning (eds.), *Atombilder: Ikonographie des Atoms in Wissenschaft und Öffentlichkeit des 20. Jahrhunderts* (Göttingen, 2009). Models are discussed in a somewhat broader context in Soraya de Chadarevian & Nick Hopwood (eds.), *Models: The Third Dimension of Science* (Stanford, 2004). A more relevant reasoning is found in Svante Lindqvist, *Technology on Trial: The Introduction of Steam Power Technology into Sweden, 1715–1736* (Uppsala, 1984), chapter 2. Per Carlsson (ed.), *Fysik i Frescati 1937–1987: Föredrag från jubileumskonferens den 23 oktober 1987* (Stockholm, 1989) and the festschrift *Manne Siegbahn 1886 3/12 1951* (Uppsala, 1951) discuss the research done using the two accelerators. *Redogörelse för Atomkommitténs verksamhet 1945–1949* (Stockholm, 1950) includes a general programme for the era's research in the field. The *Atomåldern* exhibition catalogue has some documentation and some examples of newspaper reports can be found in *Stockholms-Tidningen*, 4–12 March 1949, *Aftonbladet*, 7 February and 9, 13 and 20 March 1949, *Dagens Nyheter*, 11 March 1949, and *Svenska Dagbladet*, 14 March 1949.