

The Magic Lantern

THE BEGINNINGS OF THE MODERN TOY INDUSTRY IN GERMANY: PETER FRIEDRICH CATEL AND THE FIRST TOY LANTERNS

Bernd Scholtze

INTRODUCTION

The important supporting role played by the toy lantern has been overlooked in most accounts of the history of the magic lantern. It is generally forgotten that, at least in the German market, the manufacture and trade in toy lanterns continued for a period of almost one and a half centuries, from 1780 until the 1930s. Only the last third of this period, after the creation of the German Empire in 1871, is relatively well documented, mainly through the inclusion of lanterns in the catalogues of well-known and successful Nuremberg toy factories such as Bing, Plank, Schoenner, Dannhorn or Carette.¹



Largest magic lantern model made by Rose, c.1800, for wood framed slides (©Hessisches Landesmuseum Darmstadt - Physikalisches Kabinett)

The history of the toy lantern can only be understood in the wider context of

a market for 'philosophical' toys that was developed at the end of the eighteenth century. What, then, were philosophical toys? These were small-scale replicas of devices used in scientific and educational contexts: simplified working models, usually made by traditional instrument makers. For the toys, expensive metals or precious woods were replaced by cheaper materials such as softwoods or cardboard. Their production in anonymous Nuremberg workshops also helped to keep their prices low.

In the mid-eighteenth century travelling showmen with scientific experiments, in particular demonstrations of electricity and magnetism, created a widespread interest in and openness to natural science amongst urban populations.² Besides

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1. Hauke Lange-Fuchs: 'Nuremberg Magic lantern production'. In: *The New Magic Lantern Journal*. vol. 8, no. 3. December 1998
2. See Oliver Hochadel: *Öffentliche Wissenschaft: Elektrizität in der deutschen Aufklärung*. Göttingen 2003

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the show income of these showmen, their economic success was in part determined by the sale of philosophical instruments. The three major optical inventions of the seventeenth century – the telescope, the microscope and the magic lantern – were not included in the repertoire of these performances. A small eyepiece could hardly entertain a large audience, while darkening different rooms for the magic lantern was not always practical. Nevertheless, all three instruments clearly belong in this context since, as several examples in rare surviving catalogues show, they were regularly offered for sale by these public experimenters. The majority of the rural population seems to have been largely excluded from this development, as from many others.

With this proviso, it might be said that scientific knowledge was not only known in elite scientific circles but was encountered in everyday life, even amongst children, now regarded by enlightened citizens as important members of society. A part of the urban population could even afford the luxury of philosophical toys for their children, and they only awaited new products to fill this gap in the general range of toys.

From 1780 onwards optical, electrical, magnetic and mechanical toys derived from professional models were developed and became commercially available. Dolls and wooden toys that had been traditional for centuries remained standard commodities in toy stores, but they began to lose their monopoly position. The philosophical toy was the harbinger and the trigger for a restructuring of toy manufacturing and distribution. By the end of the eighteenth century, the mechanical-optical workshops, who both produced and distributed finished instruments, lost their *raison d'être* in a changing market. As the nineteenth century approached, there was an increasing division between production and distribution, a trend that applied to professional instrument makers as well as to the first toy retailers.

In the years from 1780 to his death in 1791 Peter Friedrich Catel entered into the picture as a Berlin toyshop owner. He was not only a brilliant and largely self-taught mechanic of great ingenuity, but also an astute businessman. By 1793 he had established the foundations of the modern toy trade, as embodied in Nuremberg by merchants such as Georg Hieronymus Bestelmeier – businessmen without craft skills who focused exclusively on retail while production of the merchandise was left to a third party. This pattern already existed for wooden toys and dolls, but for philosophical instruments as toys this was an innovation.

'NUREMBERG' SHOPS

The first evidence of toy production in Nuremberg goes back to the fourteenth century. Already at that time traders were shipping handmade products to all parts of the country. By the fifteenth century there was a popular saying 'Nürnberger Hand geht durch alle Land' ['What is made in Nuremberg goes throughout the land'], and during the seventeenth and eighteenth century this also extended to Nuremberg toys.

Up to the end of the eighteenth century the term 'toy' still meant wooden items and dolls, though tin

toys were also introduced during the period of the Seven Years' War (1756–63). Nuremberg tradesmen had bought wooden toys from woodcarvers working at their homes in the Thuringian Forest (Erzgebirge), or in the Bavarian regions Berchtesgaden and Oberammergau, since the sixteenth century, shipping them to customers in Europe and beyond. Many contemporary reports refer to the difficult working conditions endured by these poor woodcarvers and their families.

Two factors underpinned the low prices these toys achieved in the world market. On the one hand the craftsmen themselves were not organised and so competed against each other to depress prices. On the other, there was the ruthlessness of the traders themselves. They would routinely imitate each other's new products so that if something was successful, its price was soon overtaken by increased supply, which drove down both the price of commodities and their quality.³

Toy retailers would order the desired products directly from the craftsmen and then deliver them to customers at home and abroad. A trade directory from 1798 mentions over seventy-five such dealers in Nuremberg alone, including well-known companies such as Bestelmeier, Fendler & Comp. or Haugk.⁴ Because dealers regularly participated in the major trade fairs in Germany and neighbouring countries, Nuremberg toys were widely distributed. Consequently, the new philosophical toys were rapidly introduced in major trading centres, and during the eighteenth century independent shops with a wide range of toys, popularly known as 'Nürnberger Läden' ['Nuremberg shops'], were established in the larger cities.

In Frankfurt am Main in 1773, a Mrs Gölzin offered 'Nuremberg wares, Wooden galanterie toys, dolls and figures.'⁵ Samuel Jakob's Commercial Directory for the city appearing four years later similarly mentions a 'Nuremberg dealer in wooden games and dolls' goods! As early as 1740, Berlin had a 'Nuremberg' shop owned by Pierre Gervais in the Brüderstraße.⁶ By 1769 there were two thriving 'Nuremberg' shops in the city. Like C.C. Mebus in the adjoining Breiten Straße, the 'Nuremberg' shop in the Brüderstraße sold 'dolls' stuff.'⁷ A Mr Bardin ran the shop in Brüderstraße, selling 'Nuremberg wares, in addition to... dolls in brass, ivory, pay tokens and similar, mirrors etc., oilcloths.'⁸ Ten years later in 1779, shortly before it was taken over by Catel, this shop was again mentioned in a description of the residential city of Berlin by Friedrich Nicolai as a 'depository of Nuremberg wooden goods such as a toys, chess and Tressette games [an Italian card game], pocket games, counters etc.'⁹ At Mebus's shop the buyer would find 'Nuremberg and other fine toys for children, Italian chess, Tressette and other games.'¹⁰

The toys offered so far give no indication of the revolution in the toy market that was to follow shortly after.

PETER FRIEDRICH CATEL (1747–91)

We focus now on the Nuremberg shop of Bardin at Brüderstraße 2 in Berlin, the premises that would

3. Carl Leopold Seuffert: *Ueber die Nothwendigkeit und die Wirkung des größeren Fabrikbetriebs im Bereiche der sogenannten Nürnberger Gewerbe*. Munich 1855, p. 10.

4. *Versuch eines allgemeine Handlungs- und Fabrikenadreßbuches von Deutschland und einigen damit verwandten Provinzen...Ronneburg and Leipzig* 1798, p. 75 etc.

5. *Franckfurter Mercantil-Schema oder Verzeichniß*, Frankfurt 1773, p 22 etc.

6. Ernst Consentius: *Alt-Berlin, anno 1740*. 1907, p. 146.

7. Friedrich Nicolai: *Beschreibung der Königlichen Residenzstädte Berlin und Potsdam*. Berlin 1769, p. 439.

8. *Ibid*

9. Friedrich Nicolai: *Beschreibung der Königlichen Residenzstädte Berlin und Potsdam und aller daselbst befindlicher Merkwürdigkeiten*, vol I, Berlin 1779 p. 361.

10. *Ibid*

become the starting point of the modern toy industry in Germany.

Around 1780, Peter Friedrich Catel took over the store from Bardin.¹¹ Catel's parents were descended from Huguenot religious refugees from Sedan in France,¹² who found a new home in Brandenburg-Preußen thanks to the 1685 Edict of Potsdam issued by the Elector, Friedrich Wilhelm.¹³ Catel worked as an assessor at the French court in Berlin; one newspaper even called him the 'owner [official representative?] of the French court to Berlin.'¹⁴ Brüderstraße is one of the most prestigious streets in the Berlin district of Alt-Cölln and is directly adjacent to the Schlossplatz [Palace Square]. It was one of the most desirable residential streets for members of the French community in Berlin.¹⁵ (Shortly after World War II the houses were torn down to make way for a green space.) From his window, Catel enjoyed a direct view of the Berliner Stadtschloss [City Palace of Berlin].

In the same street lived other people that Catel held in high regard, such as the engraver Daniel Chodowiecki (1726–1801) and the writer and publisher Christoph Friedrich Nicolai (1733–1811), 'an early master of media and communications' who established at Brüderstraße 13 'a meeting place for politicians, scientists and intellectuals – a forum for politically assertive citizens.'¹⁶

Catel enjoyed friendships with his two neighbours: Chodowiecki was immortalised in an engraving depicting Catel's wedding anniversary, and Nicolai often refers to Catel in his popular descriptions of Berlin and Potsdam.

The wind of Enlightenment thought blew through Brüderstraße. Though largely forgotten in the history of science, Catel was one of the great pioneers of his time, not through theoretical works or political activities but for combining the ideals of the Enlightenment with his practical business as toy retailer.

Catel had two sons with his wife Elisabeth Wilhelmine (née Rousset), whom he married in 1774: Franz Ludwig and Ludwig Friedrich. The first trained as a painter, the second became an architect and was an initiator and founding member of the Berlin Artists Association. Catel had strong opinions on his sons' education.

He let his two sons Ludwig, and Franz, two years his junior, participate in the skilled production of the sweetest music boxes that he supplied to the public, and so tried not only to develop their skills, but also to awaken in them a mercantile sense. He wanted his sons to be craftsmen, because he considered that to be a most useful position and, if nurtured appropriately, a safe livelihood. The eldest son was intended to become a printer, the younger a wood sculptor. He therefore allowed them to acquire the necessary basic knowledge in school, but gave them no scientific training.¹⁷

In addition to his work as an assessor, Catel was building a reputation for his philosophical instruments. Nicolai describes one of these artifacts in August 1781



Brüderstraße in Berlin; coloured aquatint, 1820 (author's collection)



Daniel Chodowiecki: portrait of Mrs Catel, sanguine, Daheim im neuen Jahrhundert, no. 18, 2 February 1901 (author's collection)

as a self-moving globe, later to be found in Berlin in the library of the Privy Legation councillor D. Oelrichs.¹⁸ It was 'a self-moving globe with a clockwork movement... which Mr Catel can have manufactured according to his specifications by the watchmaker Christian.'¹⁹ The invention was even considered worthy of mention in the *British Literary Journal*.²⁰ Catel believed his most popular invention was his brass pedometer, made according to his specifications by Peter Friedrich Blasius Droz of the Royal watch factory. (Droz was the nephew and apprentice of Pierre Jaquet's father, and his son, Henry-Louis Droz, was well known for making automata.²¹) The pedometer was used by travellers, amongst others by his neighbour, Nicolai.

All this shows that even before taking over the shop in Brüderstraße in 1780 Catel was already a well-known personality in the city, and many visitors to Berlin consulted him to repair their mechanical devices. This would prove fortunate when Catel fell victim to Cramer's judicial reforms in Berlin, and was dismissed

11. Peter Friedrich Catel: *Mathematisches und physikalisches Kunst-Cabinet dem Unterrichte und der Belustigung der Jugend gewidmet*. Berlin und Libau 1790, Preliminary Report IV.
12. *Neue Deutsche Biographie*. Ed. History Commission of the Bavariann Academy of Sciences, Berlin 1957.
13. Reimar F. Lacher: *Ludwig Friedrich (gen. Louis) Catel (1776 – Berlin 1819)* in: www.berliner-klassik.de
14. *Coburger Wöchentliche Anzeige*. No. XXXIII, 13 August 1779.
15. Martin Mende: *Brüderstraße*. In: *Mitteilungen des Vereins für die Geschichte Berlins*. vol. 2. April 2009. pp. 188–192.
16. Wolther von Kieseritzky: *Cölln an der Spree. Herrschaftszentrum und bürgerliche Stadt* in: *Mitteilungen des Vereins für die Geschichte Berlins*. vol. 2, April 2009, p. 179.
17. Reimar F. Lacher: *Ludwig Friedrich (gen. Louis) Catel (1776 – Berlin 1819)* in: www.berliner-klassik.de/
18. Friedrich Nicolai: *Beschreibung einer Reise durch Deutschland und die Schweiz im Jahre 1781*, pp. 17 etc.
19. Friedrich Nicolai: *Beschreibung der Königlichen Residenzstädte Berlin und Potsdam*, vol 2, Berlin 1786, pp. 287 etc.
20. *Literary Journal*. Vol LXV. London 1781, p. 517.
21. Friedrich Nicolai: *Beschreibung einer Reise durch Deutschland und die Schweiz im Jahre 1781*. Berlin 1783, pp. 17 etc.

from the civil service.²² As a merchant with impressive mechanical ingenuity, Catel took the bold step of taking over Bardin's 'Nuremberg' shop. Perhaps Bardin was pleased to find a buyer so he could concentrate on his silk stocking factory, established in 1776.²³

Catel now turned his passion into his profession. The auguries for successfully running the business were good. The new owner had vision, the commercial courage to be independent, and the necessary knowledge and skill to implement his plans. With this takeover, the existing range was supplemented by philosophical toys. This makes Catel the founder of the modern children's toy, and generations of toy manufacturers and dealers continue to build on his ideas to this day.

Catel's personal motivations were reported by the Berlin publisher Françoise Théodore de Lagarde (1756–1824) in his foreword to Catel's *Mathematischen und physikalischen Kunst-Cabinet*, a retail catalogue from 1790:

The merchant Catel has remarked for many years that the toys and figures given to children are crudely manufactured, entirely without symmetry and lacking natural proportions. Instead of providing realistic images of things for youngsters they give them incorrect ones. Impressions made at a tender age are difficult to replace, which can partly explain the fact that most people have so little taste for what is truly beautiful. He also remarked that teachers in most sciences can only use very vague terms to teach students how to use instruments or run their experiments, because instruments themselves are too scarce and only a few engravings are available. Mathematical and philosophical implements were so expensive that only a few have access to them. ... He therefore had everything that occurs in common life made according to the exact proportions, following his own prototypes. Heads, hands and other limbs were proportionally correct. Tables, chairs, cabinets, beds, in short all household and kitchen utensils were correctly made, so that you did not see, as usual, a chair bigger than the table, or a character as big as the house next to him; but everything was just as it is found in nature. Moreover, things were not spoiled by bright and disgusting colours.²⁴

Catel transformed the jumble of different scales in dolls and wooden toys into a uniform standard for children. The educational benefit was great, because for the first time they could use different toys together and so experience new worlds, while at the same time reflecting reality. Catel felt a deep need to perceive children as full members of society; he was a true philanthropist carrying the Enlightenment spirit of the Berlin Brüderstraße to the playrooms of children. But this was just the beginning. ...

Not much is known about Catel's Nuremberg shop in the initial years 1780–84; he probably kept the range of wooden toys and dolls unchanged while introducing the first philosophical toys. He also embarked on other ventures. A trip to France in 1784/5

led him to found a fan factory in the city, but that had only a short life.²⁵ It is mentioned in a list of retailers and manufacturers in Berlin in July 1786 and then disappears without trace.²⁶ The 'Nuremberg' shop served not only as a salesroom, but also as a workshop. He probably began making wooden scale models to serve as templates for outworkers shortly after taking over the shop. Manufacturing these toys would have been relatively straightforward. Commission agents liaised directly with workshops to produce finished toys according to the clients' specifications, and they were probably not even aware of their role in Catel's toy revolution.

Catel was also at work adapting complex philosophical instruments into affordable toys without compromising their practical function. He was assisted in this by another brilliant engineer, a Mr Heitmann.²⁷ Considering Catel's high workload, his workshop must have resembled a creative laboratory for the development of new toys.

MARKETING

Berlin's annual Christmas market was one of the city's highlights. Crowds of people would pass by Catel's shop when they visited the decorated stalls in the immediate vicinity of the Schlossplatz, Breiten Straße and parts of Scharnstraße.²⁸ Catel worked tirelessly, expending much time and money 'for the benefit and pleasure of a highly honoured public' in the hope that they would reward his diligence by buying some of his goods.²⁹

Catel regularly published a new catalogue to coincide with the Christmas market. The first probably appeared in 1785 and divided his wares into eighteen categories, all listed without engravings: 'mathematical items, mathematical games, magnetic games, illusions, optical products, mechanical games, party games, items of wax, toys for girls, toys for boys, various handmade toys for both sexes, ironware, lacquerware, useful items for both sexes, items used in agriculture, useful items for ladies, [and] useful items for men.'³⁰

Every year Catel created a major showpiece to coincide with the Christmas market. In 1784, for example, he constructed 'a complete warship with sixty guns, five feet long [c. 150 cm] and six feet high [c. 182 cm] manufactured with all accessories.'³¹ The appreciation of the public spurred him on to even greater heights the following year with a 'perfect model of the world-famous Mount Vesuvius.'³²

During the Christmas market of 1788 some unpleasant incidents occurred, probably occasioned by the large crowds. The catalogue of 1790 recorded somewhat apologetically that:

it is really very difficult, almost impossible to satisfy everybody; nevertheless the organised event at the merchant Catel during the Christmas market in previous years was appreciated by the greater part of the public, and everything really went on in the greatest order.³³

He took the opportunity to lay down certain rules for future demonstrations: 'No one without distinction of

22. Walter Stengel: *Guckkasten Altberliner Curiosa*. Berlin 1962, p. 154.

23. Friedrich Nicolai: *Beschreibung der Königlichen Residenzstädte Berlin und Potsdam*, vol. 2, Berlin 1786, p. 518.

24. Peter Friedrich Catel: *Mathematisches und physikalisches Kunst-Cabinet dem Unterrichte und der Belustigung der Jugend gewidmet*. Berlin and Libau 1790, intro. IV–V.

25. *Politisches Journal nebst Anzeige von gelehrten und andern Sachen*. Year 1785. vol. 2, ch. 9, Sept. 1785.

26. *Handlungs-Zeitung oder Wöchentlichen Nachrichten von Handel, Manufakturwesen und Oekonomie*. ch. 26, 1 July 1786.

27. Johann Georg Krünitz: *Oeconomische Encyclopadie*, vol. 55, Brünn 1792. p. 309.

28. *Preußisch-Brandenburgische Miscellen*. Year 1805. vol. 1 ch. January, p. 70.

29. Peter Friedrich Catel: *Verzeichniß von sämtlichen Waaren so bey dem Kaufmann Peter Friedrich Catel wohnhaft in der Brüderstrasse im Nürnberger Laden zu jeder Zeit um sehr billige Preise zu haben sind*. Berlin 1785.

30. Ibid.

31. Peter Friedrich Catel: *Mathematisches und physikalisches Kunst-Cabinet dem Unterrichte und der Belustigung der Jugend gewidmet*. Berlin and Libau 1790, intro. IV–V.

32. Peter Friedrich Catel: *Verzeichniß von sämtlichen Waaren, welche bey dem Kaufmann Peter Friedrich Catel, wohnhaft in der Brüderstrasse im Nürnberger Laden, zu jederzeit um sehr billige Preise zu haben sind*. Berlin 1786. p. 3.

33. Ibid.

rank and age will be granted access to the main depot, unless he purchases a ticket at the entrance for 2 groschen.³⁴ Visitors could redeem the value of the ticket when they bought a toy. Though offered free of charge the rest of the year, interested buyers during the Christmas market had to purchase the newly printed catalogue for 1 groschen.

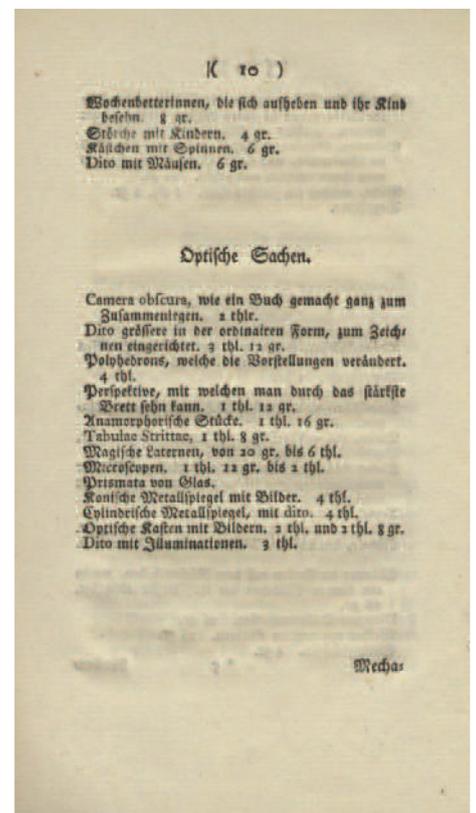
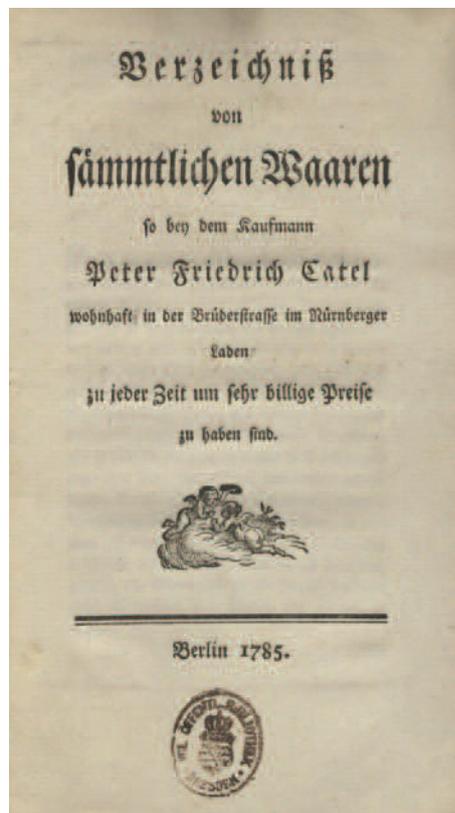
Despite containing only written descriptions, Catel's toy catalogues created a strong impression. 'This publication is perhaps the only one in Germany in which one can find all the most useful items of all kinds, so beautiful and so inexpensive, that are suitable for both the education and enjoyment of youth, and it therefore deserves the wholehearted support of the public' says the *Journal des Luxus und der Moden* in December 1787, referring to the catalogue of 1788 that was already fully advertised in the December issue of the same publication.³⁵

Similarly, the *Leipziger Intelligenz-Blatt* noted in August 1788: 'There is at present no comprehensive collection of useful toys or more serious-minded entertainments for children at reasonable prices, which is why this journal reproduces Catel's catalogue without further comment.'³⁶ A comprehensive reprint in twelve columns follows, spread over two editions. The preface to the 1788 catalogue contains a hint of Catel's declining health; he is reported to have produced various new articles, 'as much as his circumstances and strength allow'³⁷ Despite this, the catalogue included eighteen new items. In the coming years, his medical condition unfortunately did not improve. The last known catalogue of this type, a collection of toys offered without pictures, was produced for the Christmas market of 1791.

THE FIRST MODERN TOY CATALOGUE

One of Catel's most far-reaching innovations was his *Kunst-Cabinet*, published in 1790. This catalogue for selling his toys differed from earlier publications in that it used engravings as pictorial representations of the goods described. It was the first illustrated toy catalogue in the German-speaking countries. In retrospect, it can be seen as a turning point in the relationship between manufacturers and retailers on the one hand, and their customers, in particular children, on the other. The catalogue lists 400 articles, 216 of which are shown in nine separate engravings. With the descriptions and the accompanying pictures, children and adults could make informed decisions on a variety of previously unknown toys, from traditional wooden playthings to educational philosophical instruments. This illustrated toy catalogue pre-dates the oft-mentioned catalogue produced for Bestelmeier in Nuremberg by three years.

The many recommendations in pamphlets and journals are evidence for the favourable impression created by this novel form of catalogue. Many contemporary commentators recognised its importance



First-known Catel catalogue from 1785 (December 1784) (Sächsische Landesbibliothek – Staats- und Universitätsbibliothek Dresden (SLUB))

and the standard that it set for the future. We read in the *Göttingische Anzeigen von gelehrten Sachen*: 'The writer, [when reading this catalogue,] is often reminded of his own childhood years; nowadays, however, it is vital that our young people are made familiar with mechanics, optics etc. and encouraged to think about such matters through their playthings.'³⁸

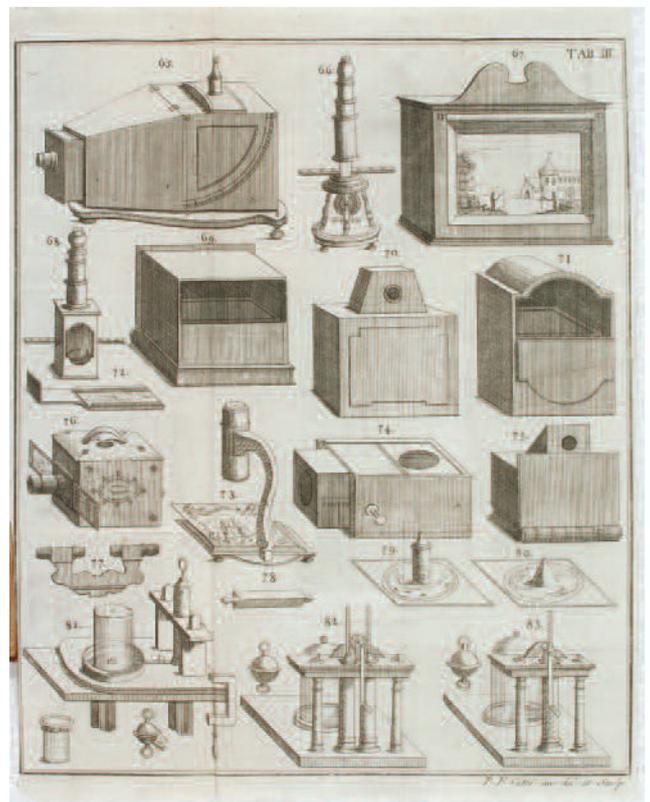
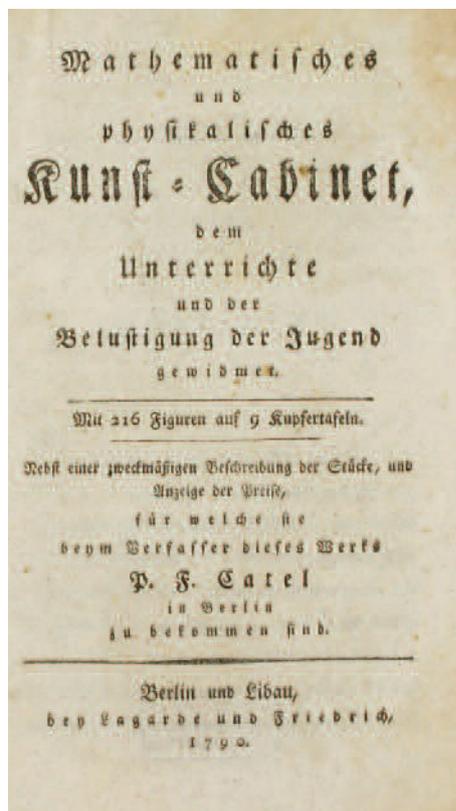
The *Journal des Luxus und der Moden* described the catalogue as 'unique of its kind, in that it does much to support the development of the first sensory skills and therefore thoroughly merits the gratitude of teachers and the support of the public... Even as a mere handbook for youth this book is very useful during lessons; and we recommend it with the utmost conviction.'³⁹ The then-popular *Oeconomische Encyklopadie* of D. Johann Georg Krünitz copied the complete descriptions of some items verbatim in his 1792 edition.⁴⁰

In this manner Catel was able to reach a wide German public, including the enlightened clientele of the *Journal des Luxus und der Moden* and more conservative readers with the *Leipziger-Intelligenzblatt*. This kind of response also opened new markets to Catel amongst a wealthy, well-educated urban society that could easily afford to buy his toys. Though prices appear relatively modest, for rural residents or city workmen his toys were still out of reach. Eight years after taking over his shop in Brüderstraße, Catel was still the only retailer in Germany to offer both the traditional wooden toys and philosophical toys, his wares 'not only well received by the Berlin public, but also by all travellers'⁴¹

The *Kunst-Cabinet* can be viewed without reservation as the first true mail order catalogue. Catel's previous catalogues were:

very often requested by non-residents, and he received sizable orders from many German cities,

34. Peter Friedrich Catel: *Verzeichniß von sämtlichen Waaren, welche bey dem Kaufmann Peter Friedrich Catel, wohnhaft in der Brüderstrasse im Nürnberger Laden, zu jederzeit um sehr billige Preise zu haben sind.* Berlin 1786. p. 3.
35. *Journal des Luxus und der Moden*, December 1787.
36. Gnädigst privilegiertes *Leipziger Intelligenz-Blatt*. no. 34, 9 August 1788.
37. Peter Friedrich Catel: *Verzeichniß von sämtlichen Waaren, welche bey dem Kaufmann Peter Friedrich Catel, wohnhaft in der Brüderstraße im Nürnberger Laden, zu jederzeit um sehr billige Preise zu haben sind.* Berlin 1788.
38. *Göttingische Anzeigen von gelehrten Sachen*. ch. 112, 15 July 1790.
39. *Journal des Luxus und der Moden*. August 1790.
40. Johann Georg Krünitz: *Oeconomische Encyklopadie...* vol. 55, Brünn 1792. pp. 306 etc.
41. Peter Friedrich Catel: *Mathematisches und physikalisches Kunst-Cabinet, dem Unterrichte und der Belustigung der Jugend gewidmet.* Berlin and Libau 1790. intro. IV.



Catel's Kunst-Cabinet from 1790, first image of a toy lantern (Universitäts- und Landesbibliothek Darmstadt)

and even beyond. However, amateurs could not have a conception of a product only through its name. Was it big or small, heavy or light, was its appearance this or that? These were questions not answered in the descriptions, so purchasers had to make their orders haphazardly.⁴²

The two basic elements of a mail order catalogue are the goods with their description, and the shipping options. Catel combined both these elements in his *Kunst-Cabinet*. As payment terms, 'All applicants are invited, either to include a cash payment with an order, or to name a secure house that can make the payment, and also to include the costs of packaging and shipment.'⁴³ This shows that Catel hoped not just to win over the local Berlin public with his catalogue, but also that those living in other German-speaking regions should be able to buy from him. Publishing this catalogue must have been a tremendous effort for Catel, who was already in poor health, especially since he personally oversaw the engravings. He died in 1791, just a few months after it was issued.

If the *Kunst-Cabinet* was a significant innovation, so too was the range of his clientele. Children could delight in dolls and wooden toys from his 'Nuremberg' shop, while older youths were offered inexpensive mathematical and philosophical instruments. Catel also hoped to attract 'those who collect cabinets of art and philosophical items; people who, without wanting either to play or be educated, seek a respectable pastime for the home circle. To satisfy them, he arranged a collection of all kinds of manufactured games, magnetic amusements, games of deception and parlor amusements.'⁴⁴ The final range of goods was intended for those who 'are looking for gifts, such as ladies for their relatives, young gentlemen for ladies, children for their fathers or mothers, or parents for their adult children', not covered by the

previous three categories.⁴⁵ For them, the shop provided a large quantity of attractive decorative items.

Key to Catel's success was the manufacture in toy form of devices that would otherwise be too expensive.

So, for example, he made armillary spheres or Armind Globes of cardboard that used to be made in brass at great expense. He made usable astrolabes from good hardwood and many other instruments that are inexpensive but can still be used to the desired effect.⁴⁶

Catel's 1785 catalogue already listed the magic lantern under the list of optical toys: 'Magic Lantern, from 20 groschen to 6 thaler.'⁴⁷ This is the first known mention of a magic lantern intended solely for the instruction and entertainment of children. Both the description and the price would remain the same until the 1790 edition. A magic lantern for sale at 20 groschen appears unusually cheap and suggests a softwood or cardboard model. In 1757 the author Denecke had already described a magic lantern made of cardboard, sheet metal or softwood.⁴⁸ The *Leipziger Intelligenz-Blatt* of 9 August 1788 also mentions 'a very large magic lantern, at 12 thaler' not listed in Catel's catalogue.⁴⁹ This price was too high for a toy, so this larger model was obviously meant for adult buyers. Although the children's toy lantern is pictured on an engraving in the aforementioned 1790 catalogue, the design details of this large model remain unknown.

In recent years the term 'tin lantern' had become customary for this design. As the accompanying description noted:

The Laterna Magica (Figure 76) is a tin lantern with a tube at the front containing two lenses. In the lantern itself is a lamp with a concave mirror; besides this there is a case, which contains 12 glass

42. Peter Friedrich Catel: *Mathematisches und physikalisches Kunst-Cabinet, dem Unterrichte und der Belustigung der Jugend gewidmet*. Berlin and Libau 1790. intro. X.
43. *Ibid.* intro. XIII.
44. *Ibid.* intro. VII etc.
45. *Ibid.* intro. IX.
46. *Ibid.* intro. VI.
47. Peter Friedrich Catel: *Verzeichniß von sämtlichen Waaren so bey dem Kaufmann Peter Friedrich Catel wohnhaft in der Brüderstrasse im Nürnberger Laden zu jeder Zeit um sehr billige Preise zu haben sind*. Berlin 1785
48. C. L. Denecke: *Vollständiges Lehrgebäude der ganzen Optik, oder Sehe-Spiegel- und Strahlbrech-Kunst...* Altona 1757
49. *Gnädigst privilegiertes Leipziger Intelligenz-Blatt*. No. 34, 9 August 1788 (+16 August 1788)

plates with paintings. When one lights the lamp and moves one of the glass plates back and forth behind the lenses, the painted figures will appear on a white wall in life size and with all the colours, but it must be in a dark room. They are of different sizes. The case is 5½ inches tall, 3½ inches wide and 4½ inches long [140 x 89 x 114 mm], and costs 4 thaler and 12 groschen. The others cost 2 thaler and 12 groschen, 2 thaler, 1 thaler and 12 groschen, and 20 groschen; the latter are made of wood.⁵⁰

SUBCONTRACTING

Because Catel worked alone it would be practically impossible for him to manufacture this extensive range, even with help. He needed to subcontract, and not necessarily to residents of Berlin. The business contacts with Nuremberg tradesmen established by his predecessor Bardin were maintained after Catel took over and expanded the business. A simple example is the Nuremberg Lebkuchen [a traditional German Christmas treat] offered in his catalogue. Catel 'undertook several trips, researched everywhere to see whether he could find something to serve his purpose, visited artisans and hired agents at those places that he could not visit himself because of lack of time.'⁵¹ For manufacturing the designs and models made in his workshop in Berlin, he needed to look no further than Nuremberg with its established infrastructure of craftsmen and artists.

The Nuremberg mechanic Johann Bernhard Bauer (1752–1839) probably manufactured philosophical toys for Catel. He was said to supply for trade 'terrestrial and celestial globes, armillary spheres, thermometers, electrifying machines of all varieties, models used for instruction in mathematics and geometric structures. He also [made] in his workshop many types of mechanical toys that [had] both a serious and an amusing purpose.'⁵² When Bauer's activities began around 1790, there was no other distributor in Germany besides Catel who might purchase his work. Another of Catel's suppliers was the Nuremberg engraver, geographer and mechanic Johann Michael Burucker (1763–1813), one of the sons of Wilhelm Burucker, who furnished him with anamorphic pictures.

Yet another of Catel's possible suppliers was David Beringer (1756–1821). By the age of 21, Beringer had become a master compass maker who made sundials, globes and compasses.⁵³ Around 1790 he entered into a business relationship with the Berlin astronomer Johann Elert Bode (1747–1826) and the privy war councillor Daniel Friedrich Sotzmann (1754–1840), transferring their drawings to a terrestrial globe.⁵⁴ Though no direct connection with Catel has yet been established, Catel lists compasses and sundials in his catalogue, and his successor, Heitmann, is known to have travelled to Beringer's Nuremberg workshop in 1792 or 1793.⁵⁵

Catel was able to subcontract part of the optical toy manufacture to the Nuremberg workshop of the engraver, painter and optician Johann Friedrich Rose (1751–85), succeeded upon his early death by his son, the mechanic and optician Johann Wolfgang Christian

Rose (1769–1826). For a master craftsman the length of training varied between three and five years, followed by an apprenticeship lasting from eight to ten years. It is therefore likely that Rose would have started his own workshop around the year 1780. Catel's search for a supplier may therefore have come at just the right time. The workshop produced magic lanterns for Catel and possibly also some additional items such as a Polyhedron and camera obscura. Which parts of the magic lantern design can be attributed to Catel and which to Rose remains uncertain. We only know that the Nuremberg tin lantern shown in Catel's catalogue was based on designs that were already on the market.

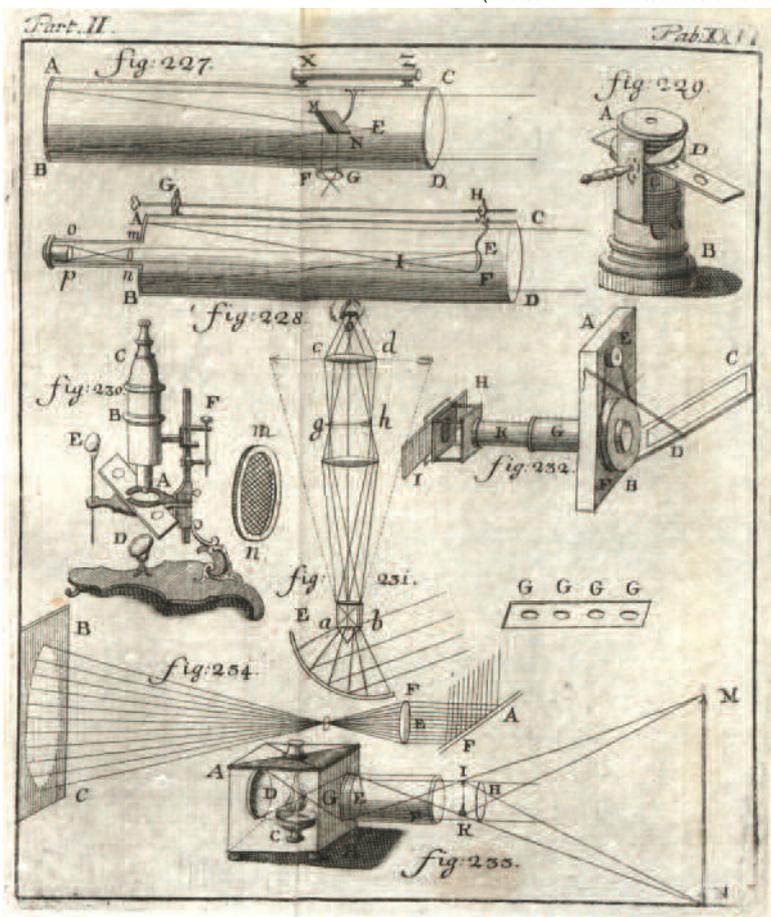
REDESIGNING THE LANTERN

Although Catel adopted existing models, possibly from Augsburg or Nuremberg workshops, he can still be regarded as the creator of the first toy magic lantern. The professor of experimental physics, Father Blasius Henner of the University of Würzburg, had published a course of scientific lectures in 1760 and manufactured a magic lantern that broadly anticipates the toy lantern.⁵⁶ Henner was responsible for increasing the philosophical collection of the University with new equipment that he had bought while travelling through Holland and France or commissioned from Augsburg and Würzburg craftsmen. By the year 1782, the collection was housed in fifteen glass cabinets that touched the ceiling.⁵⁷

Judging from its appearance, the magic lantern pictured here was unostentatious and reduced to its

50. Peter Friedrich Catel: *Mathematisches und physikalisches Kunst-Cabinet, dem Unterrichte und der Belustigung der Jugend gewidmet*. Berlin and Libau 1790, p. 29.
51. Ibid. intro. VIII.
52. Johann Ferdinand Roth: *Geschichte des Nürnbergischen Handels*. Leipzig 1802, p. 146 etc.
53. http://watch-wiki.org/index.php?title=Beringer,_David/de
54. Reader's letter of David Beringer in: *Kaiserlich privilegirter Reichs-Anzeiger*. No. 63, 11 September 1793.
55. Wilhelm Heinrich Wackenroder: *Werke und Briefe* (Gesamtausgabe in einem Band). Heidelberg 1967. p. 514 etc.
56. Blasius Henner: *Conatus Physico-Experimentales Dec Corporum Affectionibus Tum Generalibus Tum Specialibus Ad Usum Philosophiae Candidatorum Suscepti*. vol. 2. Würzburg 1760. Engraving XXVI.

Blasius Henner: *Conatus Physico-Experimentales*, vol. 2, Würzburg 1760 (Hochschul- und Landesbibliothek Fulda)



57. A. Friedrich Ringelmann: *Beiträge zur Geschichte der Universität Würzburg in den letzten zehn Jahren. In: Zum Jubel-Feste der treuen Bayern am 12ten October 1835 bringt die königliche Universität Würzburg ihre Huldigung dar.* Würzburg 1835. p. 45.
58. Deac Rossell: *Laterna Magica • Magic Lantern.* Band 1. Stuttgart 2008. p. 110.
59. Peter Friedrich Catel: *Mathematisches und physikalisches Kunst-Cabinet, dem Unterrichte und der Belustigung der Jugend gewidmet.* Berlin and Libau 1790. intro. IX.
60. i.a. Ladislaus Edler von Benesch: *Das Beleuchtungswesen vom Mittelalter bis zur Mitte des XIX. Jahrhunderts, aus Österreich•Ungarn, insbesondere aus den Alpenländern und den angrenzenden Gebieten der Nachbarstaaten.* Wien 1905
61. (Peter Friedrich Catel): *Anweisung zu einem von Peter Friedrich Catel neuerfundenen historisch-chronologischen Spiele nebst 480 dazu gehörigen kurzen Biographien aus der alten und neuen Geschichte.* Berlin 1791
62. Johann Georg Krünitz: *Oekonomische Encyclopädie, oder allgemeines System der Staats- Stadt- Haus- u. Landwirthschaft, in alphabetischer Ordnung.* Vol. 55, Brünn 1792. p. 306

purest function. Compared to contemporary illustrations of instruments from mechanical-optical workshops, little value has been placed on creating a magnificent appearance. That points to the Augsburg workshops that manufactured simple lanterns for the Savoyards in the first half of the seventeenth century.⁵⁸ Alternatively, it might have come from Nuremberg, where tinsmiths had been finishing magic lanterns for urban buyers from the last quarter of the seventeenth century onwards. Catel would base his own toy lantern on a similar model.

Catel ingeniously simplified the magic lantern as far as he could without compromising its function, making it available to a wider public at a reasonable price. The sides of the case were folded from a rectangular piece of tin plate, an economical and time-saving production method. To encourage children to use the device, he decorated the simple case with fancy embossed designs.

Catel placed great value on the conversion of philosophical instruments into educational toys for young people, and searched for designs that would appeal to that age group. 'His intention was an increase of useful and pleasant things, which he wanted to decorate as much as possible.'⁵⁹ He simplified the chimney by soldering a curved leaf-shaped brass covering over the roof opening, and placed a folding carrying handle on the back of the case. In the seventeenth century, the Nuremberg tinsmiths were already equipping their hand lamps with these same two elements.⁶⁰ The lantern's feet are entirely omitted.

In order to reduce the manufacturing cost of the slides, Catel replaced the traditional wooden frames with paper and kept the slot for inserting the slides correspondingly narrow. With seemingly inconsequential measures like these, Catel was able to offer his lanterns at an extremely attractive price compared to

professional models. The simple tin lantern turned out to be masterpiece of minimalist design and was so successful that it remained in production in Nuremberg workshops for nearly a hundred years.

Either Catel or Rose's workshop bought the glass slides for the lantern from home-based workers, mostly women who painted slides every day for many hours at a time, together with their children and other family members.

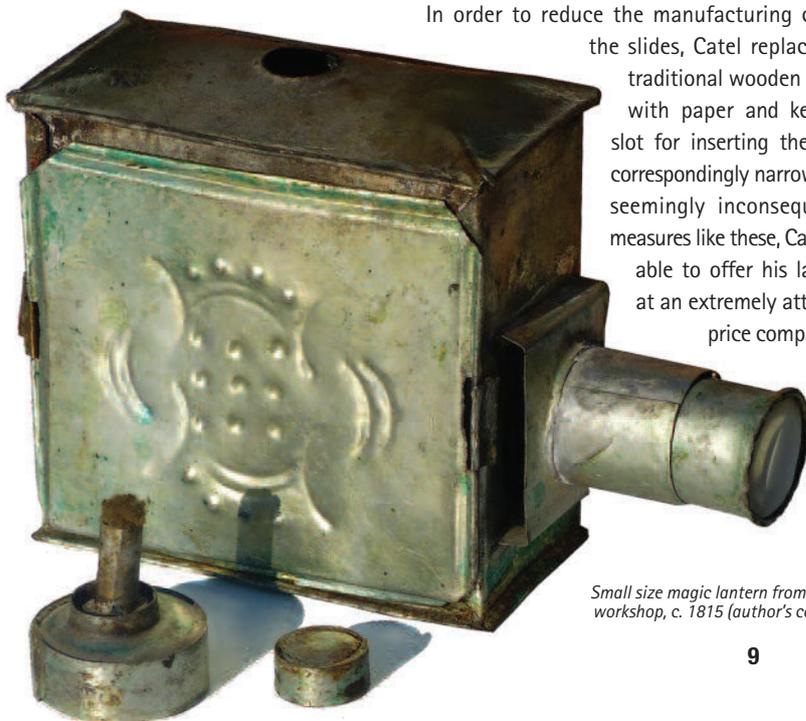
Rose's workshop supplied magic lanterns for Catel until his early death in 1791, and for many decades afterwards for the Nuremberg mail order dealer Bestelmeier.

After Catel's death the shop struggled to develop new ideas, and his children sought other professions. Items like a small historical-chronological game issued shortly after his death had no special merit.⁶¹ His widow continued the shop 'under the supervision and management of an equally clever genius, Mr Heitmann, who has spent many years cooperating with Mr Catel',⁶²



Largest magic lantern model made by Rose, c. 1800, for wood framed slides (©Hessisches Landesmuseum Darmstadt -Physikalisches Kabinett)

Largest size of magic lantern slides made by the Rose workshop, c. 1800 (Museo Nazionale del Cinema, Turin)



Small size magic lantern from the Rose workshop, c. 1815 (author's collection)

and in 1792 a catalogue without pictures appeared.⁶³ The complex Kunst-Cabinet with engravings saw a second and final edition in 1793, adding four additional engravings to illustrate fifty new items. The new products were now household products like knapsacks,

baskets for gardeners and storage barrels for butter or beer – items which seemed to promise more buyers and greater profit than toys.

Without Catel the once innovative shop was transformed into an ordinary toy store like so many others established in Germany. The shop had lost its glamour and received no further mentions in newspapers or journals, even though Catel's trendsetting ideas lived on. The widow Catel sold the business to Messrs Girard & Haug a few years later. (Like Catel, Paul Emil Girard was descended from a Huguenot family. His son Henry would later become a well-known geologist and mineralogist.⁶⁴) In 1803 Girard & Haug published a 'catalogue of all wares' comprising more than thirty pages.⁶⁵ This was a simple imitation of the catalogues without the pictures introduced by Catel, whose earlier descriptions were now adapted to a new range of toys. The 'Magic Lanterns, from 20 groschen to 12 thaler' are not out of place amongst the hodgepodge of useful household items for the ladies and gentlemen. Haug stepped down as a partner and the business was relaunched in 1806 as Girard & Co.⁶⁶ Other 'Nuremberg' shops were by now established in the city, such as Schropp & Co., and Anton Gamet located at Brüderstraße 15, diagonally across the street from Girard.

None of the Berlin toy stores, the successors of Catel, or the various new establishments that had opened up, proved able to dominate the toy market as Catel had done. The real innovators now came from Nuremberg with men such as Georg Hieronymus Bestelmeier, and these workshops would prove the dominant force in German toy production for the next hundred years.

Small size lantern slides painted for the Rose workshop, c. 1800 (author's collection)



63. *Verzeichniß von sämtlichen Waaren, welche bey des Kaufmann Peter Friedrich Catel seel. Wittwe, wohnhaft in der Brüderstraße im Nürnberger Laden, jederzeit um sehr billige Preise zu haben sind.* Berlin 1792

64. www.wikipedia.de Heinrich Girard

65. *Verzeichniß sämtlicher Waaren welche bei Girard & Haug, in der Brüderstraße, im Nürnberger Laden, jederzeit um beigesetzte Preise zu haben sind.* Berlin 1803.

66. Johann Christian Gädicke: *Lexicon von Berlin und der umliegenden Gegend.* Berlin 1806

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