

Illustrating the Smallpox Vaccine in Hungary 1798-1850

A fekete himlő elleni vakcina illusztrációja Magyarországon 1798 és 1850 között

Réka Krizbai student

University of St Andrews, School of Art History

rk60@st-andrews.ac.uk

Initially submitted March 1, 2021; accepted for publication March 29, 2021

This dissertation explores the images in the three treatises on the smallpox vaccine, which were illustrated between 1798 and 1850 in Hungary, which are János Stand's, Sámuel Váradi's and Mihály Kováts's publications. It looks at the background of their authors and the production of their images, as well as the quality of the illustrations. As all three treatises have one illustration and they all follow the same visual strategy, the dissertation also seeks to describe and identify the scopes of such images, and to define their role in the implementation of the practice of vaccination in the wider public. Furthermore, the wider context of the images are also outlined, which aims at demonstrating what the illustrations can tell about contemporary medical culture and publishing in Hungary, the cultural dominance of Vienna within the Empire, and the transmission of knowledge, images, and the cowpox matter in Europe and the Habsburg territories.

Keywords: smallpox, vaccine, vaccine illustration, Hungarian medical culture, transmission of knowledge, 19th century

Kulcsszavak: fekete himlő, vakcina, vakcina illusztráció, egészségügyi kultúra Magyarországon, tudásközlés, 19. század

If we start to look for illustrations of the smallpox vaccine in Hungarian treatises between the publication of Edward Jenner's (1749-1823) first treatise, the *Inquiry* in 1798 and the shift to different concerns arising around the vaccine in Hungary in the mid-19th century,¹ we can only find three illustrated treatises, based on the list of medical publications between 1750 and 1850 published in 2016 by the Hungarian Institute for the History of Sciences.² These treatises are János Stand's *A Tehénhimlőről (On Cowpox)* (1802), which was a translation of Aloysio Luigi Careno's *Sur la Vaccine* (1801), Sámuel Váradi's *A Tehénhimlő, avagy a 'Vaktzina' Természetének, és Terjesztése Módjainak Rövid Előadása (The Short Presentation of the Nature of the Vaccine)* (1802), and Mihály Kováts's *Értekezés a Himlő Kiirtásáról (Discussion of the Eradication of Smallpox)* (1822). All of these publications comprise one illustration each, which all follow the same visual pattern, and thus the imagery of the vaccine in Hungary in this period might appear unimaginative. However, the production of the treatises and the training and experience of the authors point to the conclusion that the works reflect a remarkable care for quality. The images depict the evolution of cowpox pustules following vaccination, which is important because the appearance of the pustules on different days could signify whether the vaccination had been successful or not. This was a crucial process, as vaccination was unsuccessful many times, and failure to make sure the vaccine worked was central to stopping the disease and protecting people from it. Thus, the illustrations provided guidance for a wide circle of learned people so that the wider public could benefit from the vaccine, as well. Therefore, these images contributed to and reflect the process of the social implementation of Jenner's vaccine in Hungary. The illustrations and the treatises they appear in are also worthy of attention because they shed

¹ Kiss, "Emberi vagy Állati Oltóanyag," p. 87

² Kapronczay, Gazda and Bodorné Sipos, *Száz Év Orvosi Irodalma*.

<http://www.kaleidoscopehistory.hu>

Réka Krizbai student

light on the wider context of the transmission of knowledge and images both in Europe and within the Habsburg Empire, which Hungary was part of at the time. Furthermore, these works are invaluable help in demonstrating the cultural and educational dominance of Vienna within the entirety of the Empire, and how the Habsburg occupation facilitated the distribution of the theoretical background of the vaccine and the vaccine matter itself through the strong relationship between physicians in Vienna and Hungary. The treatises also reflect the developments and the remaining challenges of the status of the publishing and printing press, and the Hungarian language of the time. Therefore, the images shed light on important processes in terms of both their subject matter and scopes, and the context of their publication.

Between the discovery of the vaccine against smallpox and the mid-19th century only three illustrated treatises were published on the subject written in Hungarian, which comprise one plate each. The first of these treatises was János Stand's (1776-1839) work, *A Tehénhimlőről (On Cowpox)* (January 1802), which was a translation of Aloysio Luigi Careno's *Sur la Vaccine* (1801). Stand, who later changed his surname to Bérczy, received his degree in Medicine from Pest in 1802, and became a county physician in 1804.³ He became an important propagator of the vaccine from 1801 thanks to a physician, who had a significant role in introducing the vaccine to Hungary, György Stáhly.⁴ The second treatise, *A Tehénhimlő (The Short Presentation of the Nature of Cowpox)*, was published in April 1802 by Sámuel Váradi (1773-1857). Váradi was still a student at the Medical University of Vienna when he wrote the treatise.⁵ There he was inspired by the most famous experts on the vaccine in Vienna at the time, Jean de Carro (1770-1857) and Aloysio Luigi Careno (1766-1810), both through personal contact and their publications.⁶ Váradi later returned to his home in Transylvania to become a county physician.⁷ These two were both medical publications on the vaccine itself and the ways it could be best implemented in the entire country. The third treatise, Mihály Kováts's (1768-1851) *Értekezés a Himlő Kiirtásáról (Discussion of the Eradication of Smallpox)* appeared in 1822 in Pest. In contrast to the earlier two, this work is on public health policy rather than the science behind the vaccine, as it discusses why smallpox had not been successfully eradicated in Hungary and what should be changed in the future to achieve this aim. Kováts received his degree from Pest in 1794, completed his internship in Vienna in the 1790s, and spent the rest of his career at the medical university in Pest.⁸ Thus, the three treatises under discussion here were written by prominent physicians, who were trained at acknowledged institutions, where they gained relevant experience with vaccination.

³ Leblancné Kelemen, "Bérczy János," p. 269.

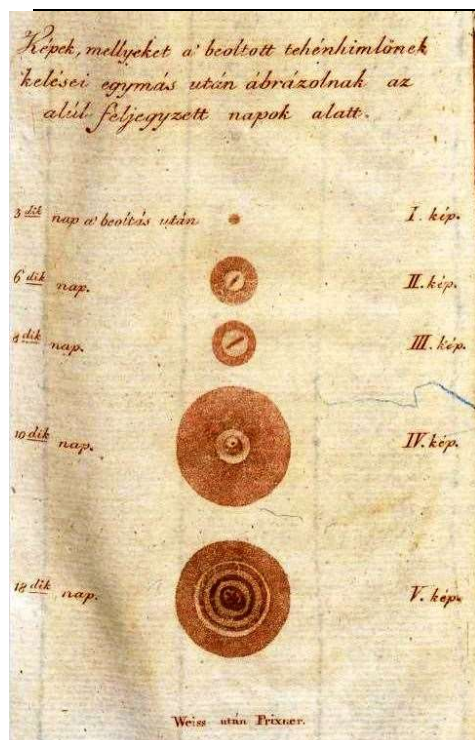
⁴ Kiss, "Bérczy," p. 215.

⁵ Kiss, "'Csak Botot Ne!'," p. 38.

⁶ Izsák, "Váradi Sámuel," p. 41.

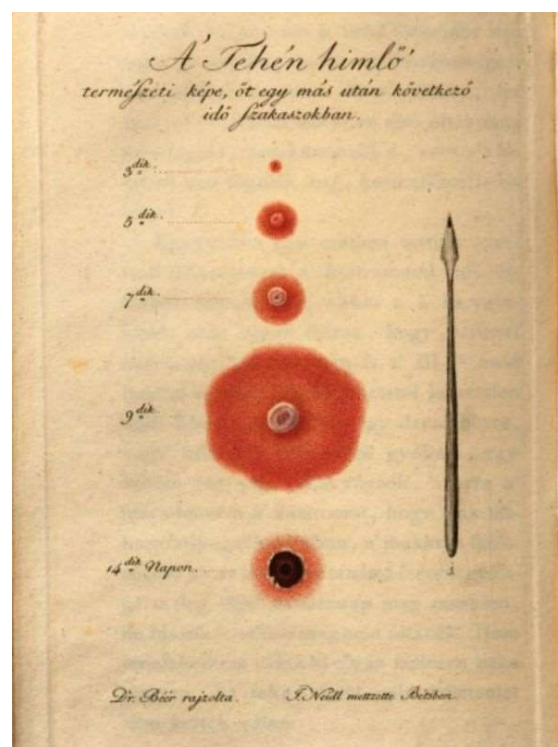
⁷ Izsák, "Váradi Sámuel," pp. 41-42.

⁸ Natter-Nád, "Kováts Mihály," p. 147.



1. ábra Figure 1: Evolution of Cowpox Pustules on the 3rd, 6th, 8th, 10th, and 18th days following vaccination. In János Stand, A Tehénhimlőről, Írta Frantzia Nyelven Dr Careno, 1802

2. ábra Figure 2: Evolution of the cowpox pustule on the 3rd, 5th, 7th, 9th and 14th days following vaccination and a lancet used for vaccination. In Sámuel Váradi, A Tehénhimlő, avagy a 'Vaktzina' Természetének, és Terjesztése Műdjainak Rövid Előadása, 1802. A



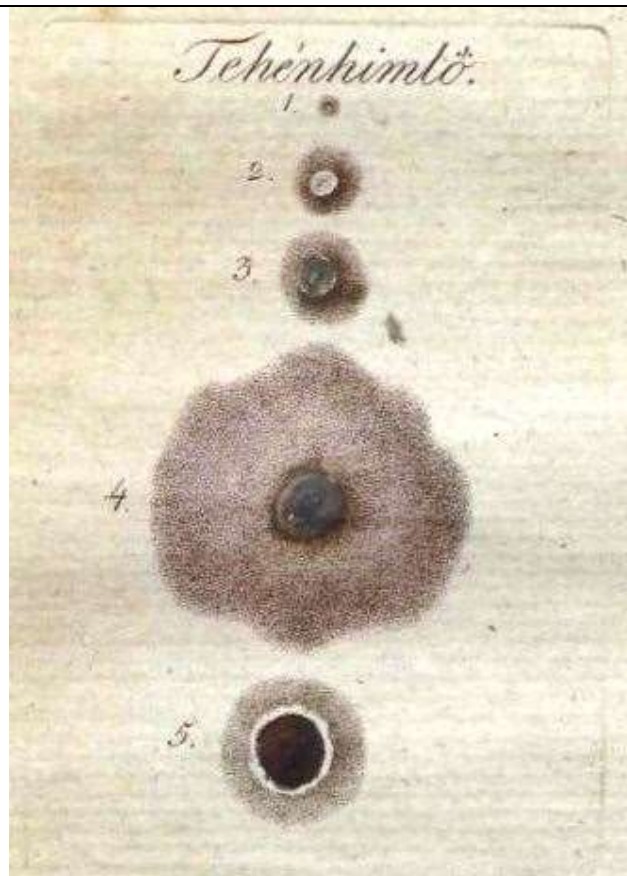


Figure 3: Evolution of the cowpox pustule on the 3rd, 5th, 7th, 9th and 14th days following vaccination. In Mihály Kovács, *Értekezés a Himlő Kiirtásról: Szerzé a Lelkitanítók Számokra*, 1822.

The three plates all follow the same visual strategy, with which they depict the temporal evolution of the cowpox pustules after vaccination. The image in Stand's work (Fig. 1) depicts the cowpox pustules on the third, sixth, eighth, tenth and eighteenth day following vaccination. The inner lighter circles represent the vesicle, whereas the brighter red areas around it depict the erythema. The areas, which appear concentric circles, indicate the brighter and lighter red areas around the pustules. Stand's pustules have a very regular circular shape with clear and well-defined outlines. Within the pustules and the erythema the different areas are also clearly defined, therefore the transition between them is not gradual. As for the colouration, in Stand's image there is no difference between the shade of the pustules on the different days, and therefore the site of vaccination appears to have the same shade of red throughout the eighteen-day period, whereas the text says that redness around the edges of the vesicle appears by the sixth day, and becomes the brightest by the tenth to the twelfth day.⁹ Váradi's (Fig. 2) and Kovács's illustrations (Fig. 3), which are nearly the same, look more naturalistic. They both depict the evolution of the cowpox pustules on the third, fifth, seventh, ninth and fourteenth day after vaccination. The edges of the erythema in their illustrations are not well defined, and they have no clear outlines. The transition between the image and the background, and between the brighter and lighter areas of the vesicle and the erythema is gradual, and there are no distinct boundaries indicated by sharp outlines between the vesicle and erythema either. In Váradi's case these gradual transitions are also true for the colouration, as the edges of the erythema in the figures are lighter,

⁹ Stand, *A Tehénhimlőről*, p. 47.

and the change in the shading of the transitions between lighter and darker areas is also gradual. The indication of different shades of red in relation to the mechanism of the vaccine in Váradi's work is very evident in the last figure illustrating the fourteenth day. There is a clear difference between the brownish dark redness of the scab, surrounded by an area of lighter redness, which indicates well that the redness is in the process of disappearance, especially compared to the previous figure on the plate. Váradi also included an image of the lancet he used for vaccinating patients. Despite that Kováts's image is not coloured, through the careful shading most of these differences of the appearance of the pustules on different days come out. Váradi's and Kováts's images also appear more three-dimensional due to the use of shading, for instance, we can see how the vesicle protrudes from the skin. Thus, all the three illustrations capture the proper temporal evolution of the cowpox pustules and the differences appearing over time, and due to the use of finer techniques, Váradi's and Kováts's images look more faithful to nature.

The production of the images, which were produced separately from the treatises in all three cases, reflect an aim at high quality. Stand names Prixner as the engraver of his image on the plate, who can be identified as the copperplate engraver based in Pest, who was known for engraving maps, most notably the famous *Mappa Generalis Regni Hungariae* (1806).¹⁰ On the plate we can read that the image was engraved after Weiss, who is also named as the engraver of Careno's *Sur la Vaccine*, the work Stand translated. Weiss can be identified as David Weiss, who was a prominent representative of stipple engraving in Vienna.¹¹ As Stand's image seems to be an exact copy of the original, his illustration might be a stipple engraving, as well. On Váradi's plate Dr Beer is named as the designer of the image, who is probably the Viennese ophthalmologist, Georg Josef Beer, who, at the beginning of his career, worked as an anatomical drawer for Joseph Barth.¹² The image is nearly identical to and possibly derived from the plate in Jean de Carro's *Observations et Expériences sur l'Inoculation de la Vaccine* (1801), and de Carro names the designer of the engraver as "Dr Beer, the celebrated ophthalmologist",¹³ which supports this identification. As Váradi identifies Neidl as the engraver on his plate, his image was probably engraved by Johann Josef Neidl (1776-1832), who had an engraving and art dealer's workshop in Vienna at the turn of the century, which produced, among others, reproductions of famous paintings.¹⁴ Similarly to Weiss, Neidl belonged to Vienna's most prominent practitioners of stipple engraving, which was introduced to Vienna at the end of the 18th century by Friedrich John, who had been in personal contact with Francesco Bartolozzi, who was the most famous representative of this technique in England in the 18th century.¹⁵ Therefore, it is likely that Váradi's illustration is also a stipple engraving. Kováts refers to his image as a copperplate engraving, nevertheless he does not name the source or the makers of his illustration. However, his image looks nearly the same as Váradi's and de Carro's, thus the origin and the technique of his image are likely to be the same as Váradi's. The choice of stipple engraving was an outstanding one not only because it was a novel technique to Vienna, but also because it was exceptionally suitable for tonal gradations.¹⁶ Therefore, both the engravers and the choice of technique speak to a remarkable care for quality.

The facts that all three images are the only illustrations in a treatise, and thus have an important role in them, and that in the first fifty years of the production of treatises on the vaccine against smallpox in Hungary all the three illustrated treatises used the same visual scheme, raise the question what such an image was good for. Carrying out a successful vaccination process was not easy and self-explanatory at this time.

¹⁰ Reisz, "A Mappa Generalis," p. 187.

¹¹ Rózsa, "Friedrich John," p. 224.

¹² Schadelbauer, "Beer."

¹³ De Carro, *Observations et Expériences*, p. 36.

¹⁴ Schöny, "Neidl."

¹⁵ Rózsa, "Friedrich John," p. 224.

¹⁶ Griffiths, "Intaglio Printing Processes," p. 78.

¹⁷ There were two major reasons why a vaccine could fail to provide the protection against smallpox as expected. Firstly, there were two different types of the cowpox virus, the “spurious” one, which was a parapoxvirus, and the genuine cowpox, of which only the latter could protect against smallpox.¹⁸ Thus, vaccinating with the spurious version resulted in failure. Secondly, as making the incision on the skin was a difficult technique at the time, sometimes the cowpox matter did not penetrate into the body.¹⁹ Therefore, it was crucial to follow up the condition of the patient and the site of vaccination in the following days and weeks, as this was the only way to make sure neither of the above mentioned mistakes happened. Consequently, thorough knowledge of how the site of vaccination was supposed to look like at various stages was the key to ensure that the vaccine worked, and this is precisely what such a visual scheme was good for. If the location of the vaccination did not look as illustrated by the plates and described by the text, the vaccination had to be repeated.²⁰ These concerns regarding the success of vaccinations are also in the centre of the texts of the treatises in question. In Stand’s work an entire chapter is dedicated to the description of the proper way of the evolution of the cowpox pustule at the site of vaccination. In this chapter a thorough description of how the site of vaccination was supposed to look like on specific days following vaccination alongside the patients’ symptoms is provided, and at each stage the corresponding image is indicated.²¹ Váradi also dedicates a lot of attention to the proper appearance of the site of vaccination. He stresses the inevitability of an image to teach and show how the site of vaccination is supposed to change in the days following vaccination, and states that he “spared no expense in supplementing the shortcomings of words with the image.”²² Váradi also wrote a chapter on how to distinguish the genuine cowpox from the spurious one. Even though there is no separate plate illustrating how the evolution of a spurious cowpox pustule might look like, he described this process in relation to his plate about the genuine one by explaining what kind of differences might be signs of an unsuccessful vaccination.²³ For instance, he writes that in the case of the spurious cowpox “the erythema is already as big on the second or third days as in the case of the genuine one on the seventh or ninth,”²⁴ which are days depicted on the plate. Therefore, even if imperfectly, such a visual strategy could also help in distinguishing between the spurious and the genuine cowpox pustules. The importance of this visual strategy and the process it depicts is maybe best proven by Kováts’s treatise, which discusses the reasons why so little was achieved in terms of eradicating smallpox from Hungary and Transylvania. He stated that one of the most major reasons was that doctors did not follow up people in the days after vaccination, and thus did not notice failed attempts.²⁵ Therefore, his treatise is a significant proof that follow-up, which was supposed to ensure that the vaccination was successful, was central to protect people from smallpox and to stop epidemics, and this visual scheme provided indispensable knowledge for this process. Another problem such an image could help to solve was that the lack of success due to the use of spurious cowpox matter could support arguments against the vaccine, and therefore an explanation of failure by a clear distinction between genuine and the spurious versions of cowpox was crucial.²⁶ Consequently, using such an image also indirectly contributed to convincing people, who were against the new practice. Furthermore, Váradi dedicated attention to the instruments and methods for making the incision, too, and he also complemented his plate with an image of the lancet he used. He

¹⁷ Williams, “Crusaders and Infidels,” p. 222.

¹⁸ Bennett, “A Tale of Two Diseases,” p. 27.

¹⁹ Williams, “Crusaders and Infidels,” p. 222.

²⁰ Williams, “Crusaders and Infidels,” p. 222.

²¹ Stand, *A Tehénhimlőről*, pp. 35-42.

²² Váradi, *A Tehénhimlő*, p. 81.

²³ Váradi, *A Tehénhimlő*, p. 131.

²⁴ Váradi, *A Tehénhimlő*, p. 132.

²⁵ Kováts, *Értekezés a Himlő Kiirtásáról*, pp. 8-9.

²⁶ Zampieri, Zanatta and Ripa Bonati, “Iconography and Wax Models,” p. 215.

<http://www.kaleidoscopehistory.hu>

Réka Krizbai student

had a specific type of lancet, which had a narrow hollow at its tip, which, according to Váradi, ensured that the cowpox matter could properly be injected into the body.²⁷ By providing the image of his instrument and the thorough explanation of why this instrument was more useful than others, he provided both textual and visual guidance for the proper technique of vaccination, as well. Therefore, this visual strategy served as guidance for an inevitable process in vaccination, and was thus a major contributing factor in stopping the disease.

This kind of visual strategy was also very beneficial for the social purposes the treatises were seeking to achieve. As the eradication of smallpox required the effort of physicians not only in university centres, but also in the countryside, each vaccinator had to be able to check whether the vaccination was successful. However, as at the time many physicians did not have the possibility to observe the techniques of vaccination and the follow-up process in person, for them treatises and illustrations meant the only way to learn how to make the incision properly and what to expect during the follow-up.²⁸ Therefore, the images had to make up for the lack of possibility for direct observation. The images, however, were not only intended for doctors. In Hungary the Church had a significant role in educating lay people about the vaccine. They were encouraged to cover the benefits of vaccination during their preaching,²⁹ and often completed the follow-up process, when a doctor was not available to do so.³⁰ Kováts's treatise is a good example of what roles the Church was expected to fulfil in the vaccination process. He states in his treatise that the education of the common people was the task of the Church, both because lay people had more trust in them than in doctors,³¹ and because doctors did not have the time to spend days in a village to follow up vaccinated patients.³² Thus, the reason he attached this specific image to his treatise was that priests in every settlement could tell, based on the plate, whether the vaccination had been successful.³³ Kováts trusted this to priests, as ordinary people in villages could not read and had no sufficient knowledge of smallpox.³⁴ Therefore, the images were not aimed at ordinary people directly, but for learned people who could both be trusted to decipher the image and complete the follow-up process, and had direct contact with lower social classes. Furthermore, Váradi's work is proven to have been widely circulated in Transylvania, and a number of schools, churches and other institutions obtained a copy, which also points to the fact that the treatise was published for the benefit of a wider public.³⁵ In the case of Stand's work the very act of translation supports the fact that he had the same social aims. Thus, the three treatises were written for the benefit of the wider public, and the use of such visual strategy, which could serve as a substitution for direct observation for a wider circle of learned people, fits this purpose very well.

The fact that the treatises were written in the vernacular also prove they were meant for the general public. As at this time Latin was still the official language both in academia and medicine, therefore if the works had been intended only for these circles, they probably would not have been written in Hungarian.³⁶ Furthermore, the target audience of Latin works were only the highest and most educated social classes, whereas Hungarian works had a significantly wider audience,³⁷ and only vernacular treatises on medicine

²⁷ Váradi, *A Tehénhimlő*, p. 54-55.

²⁸ Rusnock, "Catching Cowpox," p. 28.

²⁹ Kiss, "Rossz Keresztény," pp. 99-100.

³⁰ Kiss, "Rossz Keresztény," p. 107.

³¹ Kováts, *Értekezés a Himlő Kiirtásáról*, p. 12.

³² Kováts, *Értekezés a Himlő Kiirtásáról*, p. 17.

³³ Kováts, *Értekezés a Himlő Kiirtásáról*, p. 17.

³⁴ Kováts, *Értekezés a Himlő Kiirtásáról*, p. 12.

³⁵ Izsák, "Váradi Sámuel," p. 68.

³⁶ Bősze, "A Magyar Orvosi Nyelv," p. 340.

³⁷ Molnár, "Vienna and Hungary," p. 154.

were able to reach people of lower classes.³⁸ Publishing vernacular books on medical subjects in Hungary at the time was interwoven with the idea of the Enlightenment that lay people also had to be equipped with the knowledge of their bodies and general topics in medicine, to which making such works accessible was key.³⁹ This was a manifestation of the idea that everyone equally had the inalienable right to health.⁴⁰ Therefore, the idea of the Enlightenment that the public had to be educated in the vernacular is a key reason for writing these works in Hungarian.

These treatises and their illustrations shed light on the strong ties the Hungarian medical world had to Vienna, which had political and historical reasons. At this time Hungary was part of the Habsburg Empire and therefore was ruled by the Emperor from Vienna. The ruling monarch, Francis II (1792-1835), aimed at strong centralization in the entirety of the Empire, which further increased the already considerable dominance of Vienna even for the domains outside the Austrian hereditary lands.⁴¹ This also meant that at the time Vienna was the centre of education and culture for all parts of the Empire.⁴² The fact that even the only journal written in Hungarian language at the time, the *Magyar Kurir*, which had an important role in propagating the smallpox vaccine, was published in Vienna, illustrates this well.⁴³ However, the status of Hungarian education and culture had already started to improve. Empress Maria Theresa (1740-1780) organized the state school system in 1777 in the law called *Ratio Educationis*,⁴⁴ therefore, the Hungarian academic output grew, and literacy started to rise, even in villages.⁴⁵ She also allowed the foundation of the first Hungarian medical university in 1770 in the town of Nagyszombat, which was moved to Buda in 1777 and then to Pest in 1784.⁴⁶ Therefore, around the turn of the century most Hungarian physicians were trained either in Vienna or Pest.⁴⁷ Therefore, by the turn of the century Hungary had its own medical circles, however, it was still reliant on Vienna, which still dominated the scene. These historical circumstances point out two key phenomena, which have importance to the treatises in question. Firstly, due to the predominance of Vienna in intellectual life, knowledge about the smallpox vaccine was transferred to Hungary from Western Europe through Vienna. Secondly, physicians in Hungary had close contact with Viennese medical circles, which also facilitated the transfer of knowledge to Hungary.

This relationship with Vienna was key to acquiring the vaccine matter and its theoretical background in Hungary, which was a base for both carrying out mass vaccinations and having first-hand experience with the process of vaccination, both of which are key to the publications in question. The distribution of the vaccine matter was a particularly difficult and problematic question. As cowpox was very rare, around the turn of the century Gloucestershire, London and Lombardy had to supply all of Europe with cowpox lymph.⁴⁸ Therefore, the transportation required methods for preserving the vaccine matter for a substantial period of time.⁴⁹ There were three main solutions for this. Firstly, the lymph could be transported in a dried state, which usually meant that cotton threads were impregnated with cowpox matter, and then were dried and sealed in bottles.⁵⁰ This method was particularly popular in the early years, however, it had a major

³⁸ Szlatky, "Tissot as Part of the Medical Enlightenment," p. 196.

³⁹ Szlatky, "Tissot as Part of the Medical Enlightenment," p. 197.

⁴⁰ Szlatky, "Tissot as Part of the Medical Enlightenment," p. 197.

⁴¹ Kann, "An Empire Reasserts Itself," p. 235.

⁴² Bősze, "A Magyar Orvosi Nyelv," p. 339.

⁴³ Kiss "Azon Lelkesedésnél Fogva," p. 30.

⁴⁴ Bősze, "A Magyar Orvosi Nyelv," p. 339.

⁴⁵ Molnár, "Vienna and Hungary," pp. 148-152.

⁴⁶ Bősze, "A Magyar Orvosi Nyelv," p. 348.

⁴⁷ Szlatky, "Tissot as Part of the Medical Enlightenment," p. 204.

⁴⁸ Rusnock, "Catching Cowpox," pp. 21-22.

⁴⁹ Bennett, "A Tale of Two Diseases," p. 4.

⁵⁰ Bennett, "A Tale of Two Diseases," p. 4.

flaw, namely that it expired very quickly.⁵¹ Secondly, the lymph could also be transported in a liquid state on the tip of a lancet, nevertheless this method required a lancet made of a material, which was not prone to rusting, like gold, silver and platinum, which made transportation very expensive.⁵² The third possibility was arm-to-arm transfer, which meant that freshly vaccinated children were transported, from whose pustules lymph could be extracted on approximately the ninth day following vaccination, which then was used for vaccinating other people.⁵³ This method was the most trustworthy one.⁵⁴ Therefore, usually when a country acquired an active lymph, they spread it further in the country through arm-to-arm transfer.⁵⁵

Vienna pioneered in vaccination in the continent in many ways, which, at least in part, can be explained by the fact that many diplomats travelled between Britain and Austria in 1799 due to the Napoleonic Wars.⁵⁶ This contributed to Joseph Ferro carrying out the first cowpox inoculation outside England in Vienna on the 29th April 1799.⁵⁷ Furthermore, the first mass vaccination outside England was also carried out in Vienna, by Jean de Carro on the 10th December 1800.⁵⁸ The fact that Vienna acquired the cowpox matter so quickly was very beneficial for Hungary, as through the relations between doctors in Vienna and Hungary, the vaccine matter could be obtained in Hungary relatively quickly, as well. De Carro sent cowpox matter from the supply he had received from Jenner to Hungary, which made the first vaccination in Hungary possible, which was carried out by János Hell Nepomuk and József Pellegrini on the 14th April 1801 in Sopron, a town close to Vienna.⁵⁹ After this, the vaccine was transferred further in Hungary through arm-to-arm transfer, according to the regular practice.⁶⁰ The quick spread of vaccination to Vienna was also thanks to the distribution of treatises.

The first vaccination in the imperial city was informed by a copy of Jenner's original treatise, the *Inquiry*.⁶¹ This sparked the publication of a wide range of treatises on the vaccine from 1799 in Austria, most notably by Aloysius Luigi Careno and Jean de Carro.⁶² The most famous examples include the first Latin translations of Jenner's *Inquiry* and *Continuation of Facts and Observations* in 1799 and 1801 respectively by Careno.⁶³ These translations were also significant because they were among the key sources for Hungarian publications and their illustrations, and they informed the three publications in question to a huge extent, as well. Thus, Vienna served as a crucial gateway for both the theoretical background of vaccination and the cowpox matter for Hungary, and Vienna's pioneering status accelerated the distribution of vaccination to the country despite the difficulties of transportation. The source of the original images, which Stand's, Váradi's and Kováts's versions were copies of, are also likely to be found in Vienna. As Stand's work is a translation of Careno's *Sur la Vaccine*, his illustration also originates from the plate of this treatise (Fig. 4). This can be proven not only by the extreme likeness of the images, but also the fact that on the plate Stand states that the image was engraved after Weiss, who is the engraver named on Careno's plate. Furthermore, the caption on Stand's plate is a literal translation of Careno's, and they both describe the images with listing the number of days that had passed since vaccination on the left, and the number of the images on the right. Váradi does not explicitly state the source of his image, nevertheless his

⁵¹ Bennett, "A Tale of Two Diseases," p. 4.

⁵² Rusnock, "Catching Cowpox," p. 25.

⁵³ Bennett, "A Tale of Two Diseases," pp. 4-5.

⁵⁴ Rusnock, "Catching Cowpox," p. 30.

⁵⁵ Rusnock, "Catching Cowpox," pp. 28-29.

⁵⁶ Bennett, "Vaccine Diaspora," pp. 123-124.

⁵⁷ Flamm and Vutuc, "Geschichte der Pocken-Bekämpfung," p. 266.

⁵⁸ Flamm and Vutuc, "Geschichte der Pocken-Bekämpfung," p. 267.

⁵⁹ Kiss, "Azon Lelkesedésnél Fogva," pp. 31-32.

⁶⁰ Kiss, "A Magyarországi Himlő Elleni Oltóintézetek," p. 57.

⁶¹ Bennett, "Vaccine Diaspora," p. 123.

⁶² Flamm and Vutuc, "Geschichte der Pocken-Bekämpfung," p. 268.

⁶³ Flamm and Vutuc, "Geschichte der Pocken-Bekämpfung," p. 268.

version is probably derived from Jean de Carro's plate in his *Observations et Expérience* (Fig. 5). This is supported by the fact that the two images were drawn by the same person, Georg Josef Beer, and both were engraved by Johann Josef Neidl. Moreover, the two images look nearly identical. The shape of the pustules, the darker and lighter red areas, the evolution of the vesicle and its separation from the erythema are depicted in exactly the same way, and they both depict the cowpox pustules on the same days. The possibility that Váradi's source was de Carro's treatise is also enhanced by the fact that Váradi relies on de Carro's experiments and publications in his treatise, and that both of them were at the Medical University of Vienna at the time, which makes it likely that Váradi could easily access de Carro's works. Moreover, they probably had personal contact with each other, as well.⁶⁴ Váradi also expresses his trust and the reliability of the illustrations de Carro used in his treatise in the text of his publication.⁶⁵ Although Kováts does not name his source, or the makers of his image, his version is likely to have been derived from the same source as Váradi's. Kováts's illustration looks nearly exactly the same as de Carro's, which is the most apparent in the image of the biggest pustule. Even the edges of the erythema protrude in the same places, thus de Carro's image is a very likely source. The fact that all the images were taken from Viennese doctors, also illustrates the importance of Vienna in the treatises on and practice of vaccination in Hungary.

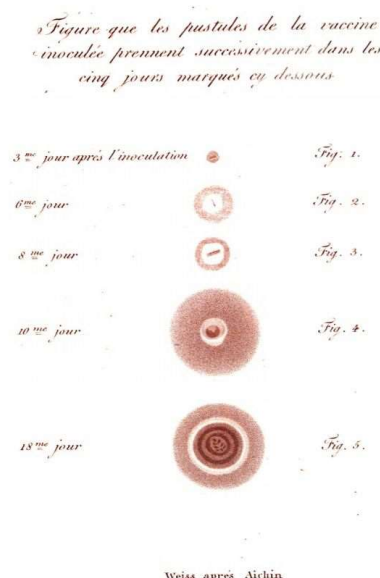


Figure 4: Evolution of the cowpox pustule on the 3rd, 6th, 8th, 10th and 18th days following vaccination. In Aloysio Luigi Careno, *Sur la Vaccine*, 1801. Retrieved from: https://books.google.co.uk/books?id=smk_AAAAcAAJ&printsec=frontcover&dq=careno+sur+la+vaccine&hl=hu&sa=X&ved=2ahUKewjDoMfarNrsAhX4VBUIHWVqD60Q6AEwAHoECAEQAg#v=onepage&q=careno%20sur%20la%20vaccine&f=false

⁶⁴ Izsák, "Váradi Sámuel," p. 41.

⁶⁵ Váradi, *A Tehénhimlő*, p. 81.

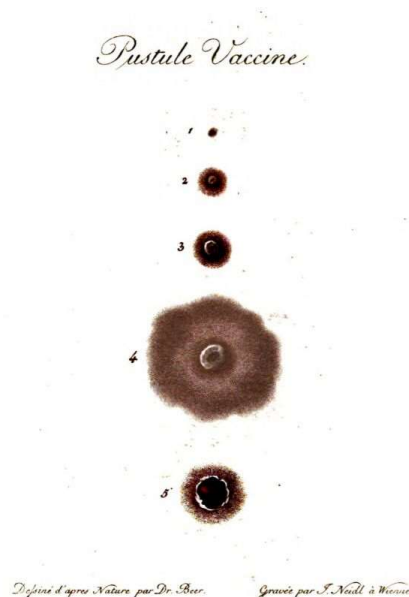


Figure 5: Evolution of the cowpox pustule. In Jean De Carro, *Observations et Expériences sur l'Inoculation de la Vaccine*, 1801. Retrieved from: https://books.google.co.uk/books?id=R5FkAAAAcAAJ&printsec=frontcover&hl=hu&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

The treatises in question were made at the dawn of a period of significant progress in the field of the publishing and printing press, which underlines both the effort required for their publication and the factors, which made the publication possible. At the beginning of the 19th century medical book publishing in Hungary was still underdeveloped compared to Western European countries.⁶⁶ However, some important changes had started to advance this field during the course of the 18th century. One of these milestones was the foundation of the first medical university in Hungary in 1770 by Empress Maria Theresa, as medical teaching increased the need for medical textbooks.⁶⁷ Furthermore, even though the number of publications in the vernacular remained small compared to Western Europe, there was a fast and exceptional growth in this regard in the second half of the 18th century, as well.⁶⁸ In the period the ratio of publications written in Hungarian jumped to more than 30 per cent of all publications.⁶⁹ Medical works contributed to this significantly, as they made up more than 10 per cent of the total number of publications in the vernacular.⁷⁰ The prominent status of medical books in the publishing press can also be explained by the fact that due to Emperor Francis II's absolutist rule censorship had a major impact on other publications, whereas medical works could be published without a problem, as they were free of political content and did not carry the danger of agitation against the Habsburg court.⁷¹ As for illustrations, the 19th century saw a significant increase in the number of illustrated medical treatises, however the most notable changes occurred later than the three publications in question.⁷² These developments facilitated the publication of the three treatises

⁶⁶ Székely, "A Magyarországi Orvosok Szakmai Tájékoztatói Forrásai," p. 274.

⁶⁷ Jantsits, "Magyar Orvosi Illusztrációk," p. 278.

⁶⁸ Szlatky, "Tissot as Part of the Medical Enlightenment," p. 196.

⁶⁹ Molnár, "Vienna and Hungary," p. 154.

⁷⁰ Szlatky, "Tissot as Part of the Medical Enlightenment," pp. 196-197.

⁷¹ Szlatky, "Tissot as Part of the Medical Enlightenment," p. 196.

⁷² Kapronczay, "Illusztrátor Orvosok," p. 169.

under consideration in the vernacular, as well, however, the fact that at the time the publishing press was still only on the verge of development makes the effort and investment put into the works outstanding, especially regarding the illustrations.

The status of Hungarian language within the Habsburg Empire and its suitability to modern life and science was also on the verge of reform in this period. Due to the Industrial Revolution vocabulary had to be significantly expanded in every language, however, this had not happened in Hungarian by the second half of the 18th century.⁷³ Therefore, Hungarian language lacked terminology in many fields, especially in the sciences.⁷⁴ This backwardness was a result of a range of factors, most notably that several other languages were used in Hungary, especially in the circles, which would have needed an expanded vocabulary the most. For instance, due to the Habsburg rule, the prominence of Vienna as a cultural and educational centre in the Empire, and the settlement of numerous German-speaking people in Hungary, German language dominated in Hungary.⁷⁵ Physicians also often relied on publications in the German language.⁷⁶ The language of the Austrian and Hungarian aristocracy was predominantly French.⁷⁷ The official language in academia was Latin, nevertheless German was occasionally used, as well.⁷⁸ Furthermore, Hungarian was only an unofficial language of a minority in the vast Habsburg Empire.⁷⁹ In the second half of the 18th century, however, the Hungarian intelligentsia realized that the development of the country required a vernacular language, which could live up to the requirements of the modern age, and therefore they initiated an extensive reform from the 1770s.⁸⁰ This idea of the language reform stemming from the aim at fighting and caring for the native language was a manifestation of the Enlightenment in Central Europe.⁸¹ The language was reformed extensively from literature to science, which was the result of a combined effort of linguists, poets, writers and scientists, which lead to the proliferation of literary works, cultural and educational development.⁸² Nevertheless, the concrete results of these aims were only achieved later in the 19th century. The institution, which could facilitate the language reform the most effectively, the Hungarian Academy of Sciences was only founded in 1825.⁸³ In addition, Hungarian language could only be officially used at universities from 1830.⁸⁴ The reform of vernacular medical language was only completed later in the 19th century, therefore at the time of the three publications in question vernacular medical language was still more reliant on the language of people from lower social classes.⁸⁵ Thus, the publication of these three treatises in the vernacular, which was crucial for their aim at reaching a wider public, was also made possible by the early stage of the language reform and the flourishing of the ideas of the Enlightenment connected to it. The preliminary stage of the language reform also underlines the fact that publishing in the vernacular required a considerable and conscious effort.

Stand's, Váradi's and Kováts's illustrations thus shed light onto a wide range of things. As all three physicians were well trained and learned about vaccination from the most outstanding figures of the history of the introduction of the vaccine in Hungary and the Habsburg Empire, like de Carro, Careno and Stáhly, and they drew on the highest quality treatises on vaccination at the time, these works are also of good quality.

⁷³ Bősze, "A Magyar Orvosi Nyelv," p. 340.

⁷⁴ Kiss, "A Magyar Orvosi Nyelv," p. 125.

⁷⁵ Bősze, "A Magyar Orvosi Nyelv," p. 339.

⁷⁶ Székely, "A Magyarországi Orvosok Szakmai Tájékoztatói Forrásai," p. 274.

⁷⁷ Bősze, "A Magyar Orvosi Nyelv," p. 339.

⁷⁸ Bősze, "A Magyar Orvosi Nyelv," p. 340.

⁷⁹ Bősze, "A Magyar Orvosi Nyelv," p. 340.

⁸⁰ Bősze, "A Magyar Orvosi Nyelv," p. 340.

⁸¹ Szlatky, "Tissot as Part of the Medical Enlightenment," p. 198.

⁸² Bősze, "A Magyar Orvosi Nyelv," pp. 340-341.

⁸³ Kiss, "A Magyar Orvosi Nyelv," p. 125.

⁸⁴ Kiss, "A Magyar Orvosi Nyelv," p. 126.

⁸⁵ Bősze, "A Magyar Orvosi Nyelv," p. 349.

It is also remarkable how much Stand, Váradi and Kováts cared for the quality of not only their sources, but also their images, which can be seen in the choice of the sources for the images and the commission of established engravers, as well as, in particular in Váradi's and Kováts's case, the exploitation of the medium of stipple engraving to achieve naturalistic tonal gradations. This care for both the content and the illustrations is especially respectable if we consider that these publications were not primarily aimed at highly educated academic circles, but for, even if learned, people living in the countryside, who were not trained in medicine, so that everyone, including illiterate people could benefit from Jenner's discovery. The choice of the visual strategy, which was probably the most helpful one for ensuring the success of the vaccination, and which focused on a very specific practical problem of the new practice, also proves this outstanding attention to the social and practical aspects of vaccination. As for the context, we can conclude that the dominance of Vienna within the Habsburg Empire at the time is outstandingly important to the production of the treatises. In the case of the distribution of vaccination, this strong relationship between Vienna and Hungary proved to be very beneficial, as Vienna was the gateway of the theoretical knowledge and treatises, the illustrations about the vaccine, and the cowpox matter for Hungary. Therefore, Hungary could exploit the pioneering status of Vienna in vaccination, which, therefore, reached this relatively backward area of Europe very fast. The examination of the status of the publishing and printing press, and the Hungarian language at the time demonstrates that the emerging developments not only facilitated the production of these works, but were the result of the conscious collective effort of authors, who published in the vernacular, which, therefore, must not be underestimated. Thus, the three images demonstrate several aspects about the early history of the smallpox vaccine and the medical culture of the time in Hungary.

Bibliography

BENNETT, Michael. "A Tale of Two Diseases: Smallpox and Cowpox." In *War Against Smallpox: Edward Jenner and the Global Spread of Vaccination*. Cambridge: Cambridge University Press, 2020.

<https://doi.org/10.1017/9781139019569>

BENNETT, Michael. "Vaccine Diaspora: Medical Networks in a World at War." In *War Against Smallpox: Edward Jenner and the Global Spread of Vaccination*.

BŐSZE, Péter. "A Magyar Orvosi Nyelv Szükségtelen Idegen Szavainak Kérdésköréhez. Unnecessary Non-Native Words in the Hungarian Medical Language." *Kaleidoscope* 10, no. 18 (2019): 329-353.

Accessed October 21, 2020. <https://doi.org/10.17107/KH.2019.18.329-353>

CARENO, Aloysius Luigi. *Sur la Vaccine*. Vienna: Albert Camesina, 1801.

https://books.google.co.uk/books?id=smk_AAAAcAAJ&printsec=frontcover&dq=careno+sur+la+vaccine&hl=hu&sa=X&ved=2ahUKewjDoMfarNrsAhX4VBUIHWVqD60Q6AEwAHoECAEQAg#v=onepage&q=careno%20sur%20la%20vaccine&f=false

DE CARRO, Jean. *Observations et Expériences sur l'Inoculation de la Vaccine*. Vienna: Imprimerie de Madame de Kurtzbek, 1801.

https://books.google.co.uk/books?id=R5FkAAAcAAJ&printsec=frontcover&hl=hu&source=gb_s_gsummary_r&cad=0#v=onepage&q&f=false

FLAMM, Heinz, Christian VUTUC. "Geschichte der Pocken-Bekämpfung in Österreich." *Wiener Klinische Wochenschrift: The Middle European Journal of Medicine* 122 (2010): 265-275. Accessed October 1, 2020. <https://doi.org/10.1007/s00508-010-1379-0>

GRIFFITHS, Antony. "Intaglio Printing Processes: Crayon-manner and Stipple: the Dot Processes." In *Prints and Printmaking: An Introduction to the History and Techniques*. London: British Museum Publications Limited, 1980.

IZSÁK, Sámuel. "Váradi Sámuel (1773-1857), Enyed Város és Alsó-Fehér Vármegye Egykori Orvosának Élete és Tevékenysége." In *Az Országos Orvostörténeti Könyvtár Közleményei 19.*, edited by Ákos Palla. Budapest: Redactio, 1960.

https://library.hungaricana.hu/hu/view/ORSZ_ORVO_OK_1960_019/?query=izs%C3%A1k%20s%C3%A1muel%20v%C3%A1radi%20s%C3%A1muel&pg=40&layout=s

JANTSITS, Gabriella. "Magyar Orvosi Illusztrációk a XVI-XVIII. Században." In *Az Országos Orvostörténeti Könyvtár Közleményei 21-22*, ed. by Ákos Palla. Budapest: Redactio, 1961.

https://library.hungaricana.hu/hu/view/ORSZ_ORVO_OK_1961_021_022/?query=a%20magyar%20orvodtudom%C3%A1ny%20t%C3%B6rt%C3%A9net%20k%C3%B6nyv&pg=4&layout=s

KANN, Robert A. "An Empire Reasserts Itself (1740-1815)." In *A History of the Habsburg Empire 1526-1918*. Berkeley, Los Angeles and London: University of California Press, 1974.

<https://doi.org/10.1525/9780520341685>

KAPRONCZAY, Katalin, István GAZDA and Ágnes BODORNÉ SIPOS. *Száz Év Orvosi Irodalma, 1750-1850*. Budapest: Magyar Tudománytörténeti és Egészségtudományi Intézet, 2016.

http://real.mtak.hu/34450/1/orvosi_adatb_mta_160318.pdf

KAPRONCZAY, Katalin. "Illusztrátor Orvosok Magyarországon a 19. Században." In *A Természettudományok, a Technika és az Orvoslás Tárgyi és Épített Emlékei*, edited by Éva Vámos and Lilly Vámosné Vigyázó. Budapest: Műszaki és Természettudományi Egyesületek Szövetsége Tudomány- és Technikatörténeti Bizottsága - Magyar Szabadalmi Hivatal, 2008. <http://real-eod.mtak.hu/id/eprint/4401>

KISS, Jenő. "A Magyar Orvosi Nyelv a XIX. Században." *Magyar Orvosi Nyelv* 2 (2013): 125-127. Accessed October 15 2020.

http://real.mtak.hu/19476/1/MONY_2013_02_A_magy_Kiss_J_u_102945.631433.pdf

KISS, László. "A Magyarországi Himlő Elleni Oltóintézetek és az Oltóanyaggal Való Ellátás Története 1890-ig." In *Égnek Legszebb Ajándéka: Barangolás a Himlő Elleni Védőoltás Magyarországi Kultúrtörténetében*. Budapest: Magyar Tudománytörténeti és Egészségtudományi Intézet, 2017.

http://real.mtak.hu/65525/2/Kiss_Himlo_elleni_oltas6_nyomdai.pdf

KISS, László. "Azon Lelkesedésnél Fogva", avagy Ki Volt a Magyar Jenner?" In *Égnek Legszebb Ajándéka: Barangolás a Himlő Elleni Védőoltás Magyarországi Kultúrtörténetében*.

KISS, László. "Bérczy (Stand) János (1776–1839) – a Védőoltások és a Fertőző Betegségek Elleni Harc Nógrádi Úttörője." In *A Jó Palócok és a Tót Atyafiak Orvosai*. Budapest: Magyar Tudománytörténeti Intézet, 2015. http://real.mtak.hu/25263/1/A_jo_palocok_u.pdf

KISS, László. "“Csak botot ne!” A Védhimlőoltás Hatósági Megszervezése Magyarországon a 19. Század Első Felében, avagy a Megyék Viszonyulása a Himlő Elleni Védőoltáshoz." In *Égnek Legszebb Ajándéka: Barangolás a Himlő Elleni Védőoltás Magyarországi Kultúrtörténetében*.

KISS, László. "Emberi vagy Állati Oltóanyag – Ez Itt a Kérdés." In *Égnek Legszebb Ajándéka: Barangolás a Himlő Elleni Védőoltás Magyarországi Kultúrtörténetében*.

KISS, László. "“Rossz Keresztény, Rossz Felebarát és Rossz Hazafi.” Az Egyházak Szerepe a Himlő Elleni Védőoltás Elterjedésében." In *Égnek Legszebb Ajándéka: Barangolás a Himlő Elleni Védőoltás Magyarországi Kultúrtörténetében*.

KOVÁTS, Mihály. *Értekezés a Himlő Kiirtásról: Szerzé a Lelkitanítók Számokra*. Pest: Petrózai Trattner János Tamás Nyomdája, 1822.

LEBLANCNÉ KELEMEN, Mária. "Bérczy János Élete és Munkássága: Nógrád Megye Egészségügyi Viszonyai a 19. Század Első Felében." In *Nógrád Megyei Múzeumok Évkönyve 25*, edited by Alajos Domonkos. Salgótarján: Nógrád Megyei Múzeumok Igazgatósága, 1979.

https://library.hungaricana.hu/hu/view/MEGY_NOGR_Muzevkonyv1979/?query=b%C3%A9rczy%20j%C3%A1nos&pg=3&layout=s

MOLNÁR, Miklós. "Vienna and Hungary: Absolutism, Reforms, Revolution, 1711-1848/9." In *A Concise History of Hungary*, trans. by Anna Magyar. Cambridge: Cambridge University Press, 2001.

NATTER-NÁD, Miksa. "Kováts Mihály Főorvos Munkássága." In *Országos Orvostörténeti Könyvtár Közleményei* 32, edited by Ákos Palla. Budapest: Redactio, 1964.

https://library.hungaricana.hu/hu/view/ORSZ_ORVO_OK_1964_032/?query=kov%C3%A1ts%20mih%C3%A1ly&pg=3&layout=s

REISZ T., Csaba. "A Mappa Generalis Elkészítése." In *Magyarország Általános Térképének Elkészítése a 19. Század Első Évtizedében – Lipszly János és Segítői Térképészeti Vállalkozásának Ismertetése*. Budapest: Cartofil, 2002.

https://library.hungaricana.hu/hu/view/MolDigiLib_VSK_ReiszLipszky/?pg=1&layout=s

RÓZSA, György. "Friedrich John és a Magyar Felvilágosodás Írói." *Művészettörténeti Értesítő* 4, no. 2 (1955): 223-229. Accessed October 29, 2020.

https://adtplus.arcanum.hu/hu/view/MUVTORTERT_04_1955/?query=johann%20joseph%20neidl&pg=241&layout=1

RUSNOCK, Andrea. "Catching Cowpox: The Early Spread of Smallpox Vaccination, 1798-1810." *Bulletin of the History of Medicine* 83, no. 1 (2009): 17-36. Accessed October 26, 2020.

<https://doi.org/10.1353/bhm.0.0160>

SCHADELBAUER, Karl. "Beer, Georg Josef." *Neue Deutsche Biographie*. (1953). Accessed November 20, 2020. <https://www.deutsche-biographie.de/pnd12296974X.html#ndbcontent>

SCHÖNY, H. "Neidl, Johann Josef (1776-1832), Kupferstecher und Verleger." *Biographisches Österreichisches Lexikon 1815-1950*. (1976). Accessed November 20, 2020.

https://www.biographien.ac.at/oebl/oebl_N/Neidl_Johann-Josef_1776

STAND, János. *A Tehénhimlőről, Írta Frantzia Nyelven Dr Careno*. Pest: Trattner Mátyás Nyomdája, 1802.

SZÉKELY, Sándor. "A Magyarországi Orvosok Szakmai Tájékoztatói Forrásai a XIX. Század Első Felében. Communicationes De Historia Artis Medicinae." In *Orvostörténeti Közlemények* 57-59, edited by József Antall. Budapest: Medicina Könyvkiadó, 1971.

SZLATKY, Maria. "Tissot as Part of the Medical Enlightenment in Hungary." In *The Popularization of Medicine, 1650-1850*, edited by Roy Porter. London and New York: Routledge, 1992.

<https://www.taylorfrancis.com/chapters/mono/10.4324/9780203354360-14/tissot-part-medical-enlightenment-hungary-roy-porter?context=ubx&refId=738a01cb-0f77-4b25-b860-d248a0676c43>

VÁRADI, Sámuel. *A Tehénhimlő, avagy a 'Vaktzina' Természetének, és Terjesztése Módjainak Rövid Előadása*. Vienna: Schrämbl Ferenc Antal Nyomdája, 1802.

http://digital.onb.ac.at/OnbViewer/viewer.faces?doc=ABO_%2BZ162882009

WILLIAMS, Gareth. "Crusaders and Infidels." In *Angel of Death: the Story of Smallpox*. Basingstoke: Palgrave Macmillan, 2011. https://doi.org/10.1057/9780230293199_10

ZAMPIERI, Fabio, Alberto ZANATTA, Maurizio RIPPÀ BONATI. "Iconography and Wax Models in Italian Early Smallpox Vaccination." *Medicine Studies* 2 (2011): 213-227. Accessed September 23, 2020.

<https://doi.org/10.1007/s12376-011-0057-5>

List of Images

Figure 1: Evolution of the cowpox pustule on the 3rd, 6th, 8th, 10th, and 18th days following vaccination. In János Stand, *A Tehénhimlőről, Írta Frantzia Nyelven Dr Careno*, 1802.

Figure 2: Evolution of cowpox pustule on the 3rd, 5th, 7th, 9th and 14th days following vaccination and a lancet used for vaccination. In Sámuel Váradi, *A Tehénhimlő, avagy a 'Vaktzina' Természetének, és Terjesztése Módjainak Rövid Előadása*, 1802. Austrian National Library. Retrieved from: http://digital.onb.ac.at/OnbViewer/viewer.faces?doc=ABO_%2BZ162882009

Figure 3: Evolution of the cowpox pustule on the 3rd, 5th, 7th, 9th and 14th days following vaccination. In Mihály Kovács, *Értekezés a Himlő Kiirtásról: Szerzé a Lekitanítók Számokra*, 1822.

Figure 4: Evolution of the cowpox pustule on the 3rd, 6th, 8th, 10th and 18th days following vaccination. In Aloysio Luigi Careno, *Sur la Vaccine*, 1801. Retrieved from: https://books.google.co.uk/books?id=smk_AAAAcAAJ&printsec=frontcover&dq=careno+sur+la+vaccine&hl=hu&sa=X&ved=2ahUKewjDoMfarNrsAhX4VBUIHWVqD60Q6AEwAHoECAEQAg#v=onepage&q=careno%20sur%20la%20vaccine&f=false

Figure 5: Evolution of the cowpox pustule. In Jean De Carro, *Observations et Expériences sur l'Inoculation de la Vaccine*, 1801. Retrieved from: https://books.google.co.uk/books?id=R5FkAAAcAAJ&printsec=frontcover&hl=hu&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false