

DOCUMENTS AND STUDIES ON 19th c. MONETARY HISTORY

Moneys and Economies during
19th Century (from Europe to Asia)

Proceedings of the Round Table of the "Silver Monetary Depreciation and International Relations"
program (ANR DAMIN, LabEx TransferS), Paris, École Normale Supérieure, January 13-14, 2012.

G. Depeyrot, editor



MONETA, WETTEREN 2012

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La Dépréciation de l'Argent Monétaire et les Relations Internationales
Silver Monetary Depreciation and International Relations
(ANR 2011 BSH3 008 01)

Program of the Round Table

Monnaies et économies au 19e siècle (de l'Europe à l'Asie)
Moneys and economies during 19th century (from Europe to Asia)

January 13-14, 2012

École Normale Supérieure, Paris, Amphithéâtre Rataud

Friday 13 January

9:00 – 9:30 Opening

Michel ESPAGNE (Director of the LabEx program "TransferS").

Georges DEPEYROT (CNRS-ENS, Paris) Presentation of the DAMIN program.

9:30-12:00 Session. In chair: Juan CASTAÑEDA

KURODA Akinobu (Professor, Institute for Advanced Studies on Asia, University of Tokyo), The Age of Foreign Silver Dollar.

Alla SHEPTUN (Lecturer, Financial University, Moscow), Money and Economic Development in 19th Century Russia.

Rita MARTINS DE SOUSA (Professor, Technical University of Lisbon, School of Economics and Management), From Bimetallism to the Gold Standard – Portugal, 1854.

KATO Keiichiro (Professor, Ryutsu Kagaku University, Kobe), Japan's Change to the Gold Standard seen through Contemporary Newspapers in Kobe.

14:00-18:00 Session. In chair: KURODA Akinobu

Marina KOVALCHUK (Assistant professor, Far Eastern Federal University, Vladivostok), G. Arbuthnot's "Reports on Japanese Currency" (1862-1863).

Michael SCHILTZ (Professor, Institute for Advanced Studies on Asia, University of Tokyo), Money on the Road to Empire – Matsukata Masayoshi and the Choice for Gold Monometallism, 1897.

NAKAJIMA Keiichi (Professor, Keio University), L'introduction de la monnaie de type occidentale au Japon.

Patrice BAUBEAU (Maître de Conférences, Paris-Ouest University), The *Banque de France* and its Moneys: Commercial Trade Bills, Notes, Gold and Silver.

Vladimir BAKHTIN (Financial University, Moscow), Russian Financial System and Wars in the 19th Century

Aleksandra MAJSTORAC KOBILJSKI (École des Hautes Études en Sciences Sociales, Paris),
Questioning the Transfer: Innovation in Coal Technology at the turn of the 20th century.

Saturday 14 January

9:15 – 12:00 Session. In chair: Jürgen NAUTZ

Juan E. CASTAÑEDA (Lecturer in Economics, UNED; Madrid), Spain's Deflations and Monetary Stability in the Late 19th Century.

Josette RIVALLAIN (Maître de Conférences, Musée de l'Homme, Paris), Monnaies d'argent en Afrique : le thaler de Marie-Thérèse.

Matthias MORYS (Lecturer, Department of Economics and Related Studies, University of York), The Emergence of the Classical Gold Standard in the 1870s.

Emmanuel PRUNAU (Doctorant EHESS – Mission Historique de la Banque de France, Paris), Achats de piastres et de métaux précieux par la Banque de France au début du XIX^{ème} siècle.

Katerina BREGIANNI (Senior Researcher, Academy of Athens, Centre for the Study of Modern Greek History, Athens), Monetary Crises in Greece during the 19th Century. Greek Membership in the Latin Monetary Union and Numismatics Issues.

14:00 – 18:00 Session. In chair: Patrice BAUBEAU

Stefano UGOLINI (Post-doctorant, Scuola Normale Superiore, Pisa), The International Monetary System, 1844-1870: Arbitrage, Efficiency, Liquidity.

Jürgen NAUTZ (Professor, Dep. of Economics, University of Vienna), Austro-Hungarian Battles for the Standard: The Academic and Political Debates about the Currency Reform in the 2nd half of the 19th Century.

Michael MÄRCHER (Curator, National Museum, Copenhagen), Danish monetary history 1850s-70s.

Ekaterina SVIRINA (Financial University, Moscow), Russian Monetary Reforms in the 19th Century.

General discussion.

Conclusion.

Coins, metals, and reforms: A survey of Danish monetary history 1813-1873

Michael Märcher (National Museum, Copenhagen)

Introduction – Danish economy and monetary goals after the Napoleonic Wars

This paper is a chronological survey of Danish monetary history from 1813 to the 1870s with focus on coin production, metals, and the reforms that took place in 1854 and the 1870s.¹

Between 1814 and 1864 the area ruled by the Danish king consisted of both the Kingdom of Denmark and the two duchies Schleswig and Holstein in Northern Germany.² The capital was Copenhagen, and the second largest city was Altona in Holstein, a neighbour of the great German city of Hamburg (fig. 1). Hamburg had one of the most important markets for money, gold, and silver. A significant Scandinavian money market did not exist.

In the Kingdom of Denmark, the period from the Napoleonic Wars to around 1830 was dominated first by a peace crisis and then by recession in the 1820s. This was followed by a long period of prosperity from c.1830, which lasted almost half a century; it mainly had to do with massive export of Danish agricultural products to Great Britain.

The monetary system in Denmark and Norway was ruined during the wars, while it had stayed stable in the duchies. Danish monetary policy was from 1813 dominated by the following two goals: First the monetary system had to be stabilized and reorganized. The circulation in Denmark was based on huge amounts of inconvertible unstable banknotes that were not at par with the silver coins; this was the main problem. A new bank was founded 1813 and it had a monopoly on note-issuing. The bank and its successor from 1818, *Nationalbanken*, and Danish monetary policy focused on the establishment of par between the notes and the silver coins until the 1830s.

The reorganization was completed in the 1830-40s. A new stable monetary system had been established – and it was time to begin work on the second goal: The creation of a common, homogeneous, and unifying monetary system in the entire realm. The kingdom and the duchies had separated systems. Fulfilment of the second goal would benefit domestic trade and administration, and strengthen the connections between different parts of the realm etc. – it was, just as the first goal, part of Danish state-building/nation-building policy of the 19th century.

¹ This paper is primarily based on Michael Märcher: *De kongelige møntsteder i Altona og København 1813-1873. Teknik og produktion* [The royal mints in Altona and Copenhagen 1813-1873. Technique and production], PhD-dissertation, University of Copenhagen 2010, to be published 2012 by The National Museum of Denmark & University Press of Southern Denmark, 338 pages.

The following articles are also used: Ingrid Henriksen & Niels Kærgård: The Scandinavian Currency Union 1875-1914, in Jaime Reis (ed.): *International Monetary Systems in Historical Perspective*, London & New York 1995, 91-112; Michael Märcher: Den skandinaviske flugt fra sølvet, *Møntsamleren*, 2003, 38-41; Michael Märcher: Sølvets tilbagegang og den bimetalske fallit, *Møntsamleren*, 2004, 14-17; Michael Märcher: Danish banking before and after the Napoleonic Wars: A survey of Danish banking 1736-1875, in Tuukka Talvio & Cecilia von Heijne: *Monetary boundaries in transition: A North European economic history and the Finnish War 1808-1809*, Stockholm 2010, 127-143; Michael Märcher: The transfer of minting techniques to Denmark in the nineteenth century, in Nicholas Holmes (ed.): *Proceedings of the XIVth International Numismatic Congress: Glasgow 2009*, vol. II, Glasgow 2011, 1725-1733.

The illustrations are from the National Museum of Denmark (fig. 1-2, 4-5, 7-8, 10), the National Archives (fig. 6), the National Bank (fig. 9), and the article about banking mentioned above (fig. 3).

² The small duchy Lauenburg was part of the realm 1815-1864, but it is generally not included in this survey.

Background – Danish mints and the industrialization of coin production

The 19th century was a period with significant changes in minting techniques. Coin production became almost fully mechanized during the century, and it is reasonable to talk about a general industrialization of coin production in Europe. The changes did not only apply to the striking of the coins and the introduction of steam power, almost all production stages were altered. An extremely important development in the very last years of the 18th century and generally in the 19th century was the introduction of die hobbing – that is die copying – and the striking of blanks in a collar with convex dies, which improved the quality of the now completely identical coins considerably. The two Danish mints in Altona and Copenhagen were in the early 19th century among the first mints in the world to implement this new coin striking technique, and in the first third of the century they were among the technically most advanced mints in the world.

Due to its advanced technique in the first third of the century, the 19th century mint in Copenhagen was of international importance, and several foreign mint employees visited it. A new mint was erected in Copenhagen c. 1806-10. It was the third of the industrialized, primarily steam driven mints, which Matthew Boulton (1728-1809) at Soho Works just outside Birmingham, Great Britain built and exported from the last decade of the 18th century.³ The first of these steam driven mints was the one in Soho, the next was set up in St. Petersburg, Russia and in operation from around 1807. The third was exported to Copenhagen, and it was in operation from around 1809 (fig. 2). Royal Mint in London was from 1810 the fourth. These new mints with massive improvements in relation to the quantity and quality of coin production gave new possibilities, and they were used in the monetary policy – and in the state building policy of the 19th century.

Important parts of the new minting techniques that came from Soho to Copenhagen were c. 1810-15 successfully implemented at the mint in Altona by Danish mint employees. Throughout the 1820s-50s, the Altona mint played an important role in Northern European trade and payments. It struck huge amounts of gold and silver coins for the international market for private customers. Hamburg only had a small unimportant mint in the first half of the 19th century, and it was destroyed in the great city fire of 1842. Hence, the mint in Altona undertook most of the coin production needed to facilitate the large-scale international trade in Hamburg 1820s-50s.

The reform of 1813

The comprehensive monetary reform of the 5th of January 1813, which is known as the State Bankruptcy, was necessary and changed most parts of the monetary system. Monetary circulation in the Kingdom of Denmark was in chaos around 1813 and made up of different types of inconvertible notes, small denomination notes, and small coins. Nothing was stable or well-organized. A general lack of all types of coins existed, especially in Jutland, where some foreign coins also circulated. The 1813-reform should introduce the new rigsbank monetary system in both the kingdoms (Denmark and Norway) and the duchies, and the entire circulation should over time be replaced by new rigsbank coins. The new unit of account was the rigsbankdaler, which was half a speciedaler; the old unit of account.⁴ The new standard coins were from the 8 skilling denomination and up⁵, while the lower denominations were small coins – that is coins below the monetary standard. ½, 1, and 2 rigsbankdaler/rigsdaler⁶ were the larger standard coins.

³ See Richard Doty: *The Soho Mint & the Industrialization of Money*, London & Washington D.C. 1998.

⁴ 1 rigsbankdaler should contain 12.641 grams of fine silver.

⁵ 1856-1873 only the ½, 1, and 2 rigsdaler were standard coins.

⁶ The name changed from rigsbankdaler to rigsdaler with the reform of 1854.

The monetary system of the duchies had in particular been separated from the kingdom since the significant Species Reform of 1788 in the duchies. In 1813, the system of the duchies was still stable, and the duchies were allowed to keep their old silver standard (the *spéciedaler* and *courant* coins). Main parts of the monetary policy 1830s-60s focused on the elimination of this system and the many foreign coins in it, and on the introduction of the new, common, and uniting monetary system in the kingdom and the duchies.

Banks, banknotes, and the raise to par 1813-1845

As part of the 1813-reform a new state-owned bank, *Rigsbanken* (the Bank of the Realm), was founded in Copenhagen and it replaced the existing banks in the realm (fig. 3). The bank had strict rules concerning the backing of note-issuing, which should be based on silver reserves from the so-called *Bank mortgage*. A compulsory 6% priority silver mortgage with an interest rate of 6½% was placed on all real estate in both the duchies and the kingdoms as part of the reform, and this forced loan became the new monetary system's financial basis. The Rigsbank issued notes after the new monetary standard, and the old inconvertible *courant* notes were changed into the new – also inconvertible – rigsbank notes at the ratio of 6:1; a considerable devaluation. The many newly issued rigsbank notes were not at par and continued to be inconvertible. Even though this was one of the most important monetary problems, the notes did not reach par until 1838 and convertibility was not reintroduced until 1845. After issuing new notes and exchange of old notes into rigsbank notes, the Rigsbank's primary task was to work on establishing par, which was primarily to be done by reducing the quantity of notes in circulation so the circulating amount would be within a reasonable ratio to the silver reserves.

However, the 1813-reform's foundation – but not its aims – was quickly considerably reduced because Norway was separated from Denmark in 1814, and because of the exceptions given to the duchies. In 1813 the duchies were not only allowed to keep their old monetary system, but the new rigsbank notes were at the same time not made compulsory means of payment in the duchies. The latter exception and the loss of Norway significantly reduced the area of circulation – and thereby demand – for the huge amount of notes, which was bad for their exchange rate and the raise to par. Because of the exceptions, the reform of 1813 did not close the old gap between the monetary matters of the Kingdom of Denmark and the duchies.

The worst part of the post-war crisis seemed to be over around 1816; therefore the plan from 1813 to create a privately-owned central bank was initiated. Denmark's Nationalbank, which is still the Danish central bank, was founded in 1818 as a joint-stock company under the name *The National Bank in Copenhagen*. It took over the Rigsbank and was given a royal charter for 90 years, which included a monopoly on note-issuing. In general, the monetary policy vis-à-vis the notes' rise to par as well as trade, shipping etc., seemed to be going very well in 1817-18. The bank was consequently given ambitious tasks in the charter. It was to use its surplus to raise the notes' exchange rate until it reached par, because par was thought to be just around the corner. Secondly it should function as a commercial bank and extend credit to benefit business and the country's economic development. However, an agricultural crisis and subsequent recession hit shortly after the bank was founded, so until c. 1835 the bank was in practice largely only able to work on the raise to par, which meant withdrawal and destruction of circulating inconvertible notes. Actually, the amount of notes in circulation was halved from 1818 to 1835, and in the same period few loans were extended. It was a hard policy of revaluation, which intensified the recession of the 1820s.

The economic situation changed just before 1830, as a long period of prosperity began. In 1835 the Nationalbank was able to stop using its surplus on the withdrawal of notes, since the quantity of circulating notes was now reduced to a level from which the general economic growth would soon raise the rate to par. When par had been reached in 1838, it

became possible to reintroduce convertibility and the silver standard in 1845 after almost 90 years of suspension (1757).

Coin production 1813-1829

Monetary policy and coin production were in the period c. 1813-1817 dominated by the end of the Napoleonic Wars and the reform of 1813. It was a transitional period with new minting techniques, the loss of Norway in 1814, the Rigsbank (1813-18), no production of gold or speciedaler coins, only absolutely small-scale production of standard coins (1 rigsbankdaler) for the Rigsbank, and an important production of copper coins (so-called rigsbank-signs) for the Rigsbank. Demands for coins were high, and regularly the mints could not supply sufficient amounts, primarily due to lack of metals, but it was also relevant that private customers were not (yet) allowed to have 1 speciedalers produced at the mints (the mints had almost no private customers 1813-17), and that the mint in Altona could not produce silver coinage 1813-14 because of the war. The later problem led to considerations regarding the future location of the mint, but these thoughts were abandoned, when it was clarified that the mint's livelihood was the location close to the important money market in Hamburg.

With the founding of the Nationalbank in 1818 and the expectations of an imminent raise to par, it finally seemed possible to do serious work on the introduction of the new monetary system and thereby replace some of the many notes, copper coins, and foreign and domestic courant coins. The circulation lacked both small and standard coins. Therefore some old coins were withdrawn from circulation and production of new, good, and high quality small (copper) and standard coins for domestic use were started 1818-19, but the 1820s ended up being a decade with only small-scale coinage for the domestic circulation. Actually, no withdrawals and no production of small coins took place in the 1820s. The minor production was caused partly by the mentioned recession's low earnings capacity in relation to foreign currency/metals until the last years of the 1820s, and partly because the Nationalbank as mentioned used its means on the raise to par. In other words, the progresses in the monetary policy were generally few and slow until the 1830s.

However, two important monetary developments evolved in the period 1818-29; the resumption of speciedaler and gold coinage in 1818 and 1827. Since 1814, private customers could only get the new 1 rigsbankdalers at a cost of 2½% at the mints, which was in no way a success. More and more people addressed this problem; especially businessmen from Hamburg confronted the mint in Altona. They wanted speciedalers, not the smaller rigsbankdalers, which were more expensive and not internationally well-known trade coins (fig. 4). From January 1819 the government for one year allowed production for private customers of both speciedalers and rigsbankdalers at respectively 1 and 1½ %. This was accepted even though the production of speciedalers was not in accordance with the reform of 1813. The reasons were that one speciedaler equalled two rigsbankdaler and primarily because the government had realized that this was a way to get silver to the mints, and to have Danish silver coins produced, and at least brought into the market in Hamburg, which would benefit Danish exchange rates. The change in 1819 was a success and extended indefinitely; many businessmen from Hamburg wanted to have their bullion turned into big, international, and well-known silver coins at the mint in Altona. The production of rigsbankdalers soon stopped, and in general not resumed until the 1840s.

More than 4.5 million speciedalers were minted in Altona in the 1820s. Most of them for private customers from Hamburg and Altona, but some silver was also delivered by public institutions and the Nationalbank. Some of the coins were put into domestic circulation, but due to the ratio towards the inconvertible notes they were not able to stay in circulation. The situation improved at a snail's pace; the rate of the notes was very slowly raised bit by bit.

The initiative to production of international gold coins in Altona came 1825 from the influential banker W.S. Warburg in Altona, who had already had hundred thousands of speciedalers produced at the mint in Altona. He also wanted gold coins, e.g. Danish 1 and 2 frederikd'or (pistols) like the ones from for example Prussia, Hanover, and Saxony. The government in Copenhagen approved after some time, considerations, and tests, but the bill did not appear until February 1827, when Warburg had delivered enough gold to start up production. The costs for 1 and 2 frederikd'or were $\frac{3}{4}$ and $\frac{1}{2}$ % respectively, which was very close to the actual costs. In general, the mint or Danish state did not make significant profit on the production for private customers, but the mint workers did received fees, extra salary etc. Private customers used the mint for gold from the last years of the 1820s, and the Altona production of gold coins quite fast became a success.

1830-1847: Stability, convertibility, and the second goal

The realm's significant export from c. 1830 meant that precious metals came to the realm. Both the prosperity and the availability of metal made large-scale coin production possible for the state and private customers.

Par was as mentioned reached in 1838, and the Nationalbank had already in 1835 stopped withdrawing notes. So in the second half of the 1830s it was time to start working seriously on re-coinage and the creation of a homogenous, common monetary system. The rigsbank standard's introduction in the duchies was among the most debated monetary questions. The duchies wanted to keep their courant standard both in relation to coins and as unit of account, and they wanted the rigsbank standard eliminated. The government in Copenhagen wanted the opposite for economical, political, and administrative reasons, and this called for a replacement of the coin circulation in the duchies. In 1841 the duchies' wishes were rejected and large-scale production of rigsbank small coins for the entire realm was initiated.

The battle had started in the 1830s; the mints had since the middle of the 1830s melted courant and foreign coins, which were withdrawn from the monetarily most important public offices, and some smaller rigsbank coins were minted in the 1830s. This operation continued until the outbreak of the First Schleswig War in 1848. More than 5 million rigsbankdaler in courant coins were, primarily after 1838, melted at the mints or sold (some foreign coins) in Hamburg. Most of the coins came from the circulation in the duchies. The gained silver was used in production of new small coins or as alloy metal for standard coins.

The large-scale rigsbank coinage from 1841 consisted of many coin types with several concessions towards the older system in the duchies. This coinage also replaced the copper coins issued by the Rigsbank 1813-18; most of them were withdrawn 1839-43. During 1841-43 the mints produced more than 15 million high quality pieces of rigsbank small coins. This was a large and important task, which the mints were only able to complete due to the development in minting techniques. New coins should be supplied quickly as the old ones were continuously withdrawn. A lack of new coins would make the monetary policy more difficult to implement, foreign coins would for example quickly circulate into any supply lacks. The hastened production led to the purchase of the realm's two first Uhlhorn (fig. 5) coin striking machines, one for each mint.

In 1843 most of the production of small coins was completed, but the withdrawals and melting continued and was intensified from 1844. It was generally a success; most of the courant and foreign coins had vanished, while the rigsbank coins and from 1845 also the rigsbank notes were used more and more in the duchies. The monetary system in the entire realm gradually became more homogenous. Some problems remained, but no new significant monetary operations regarding the duchies were initiated in the middle of the 1840s, while the many political tensions between the duchies and the kingdom intensified. The very complex *Schleswig-Holstein Question* with issues regarding succession, constitution, nationality, and

many other themes played a key role in the realm's history c. 1830-64. Monetary matters were indeed part of this serious political conflict within the realm, since monetary matters have to do with independence, language, symbols, economy, and so on.

1830-1847: Gold, silver, and private customers

18 million rigsbankdaler in rigsbank standard coins were produced 1830-47 at the two mints. This was a significant amount compared with earlier coin production in the realm, and it was only made possible due to accessibility to precious metals, many private customers, and new minting techniques, which increased the mints' capacity. Sufficient amounts of precious metal came from the withdrawals, the market in Hamburg, and the realm's export. Huge amounts of bullion or foreign coins were delivered to the mint in Altona from primarily merchants, merchant bankers, and other businessmen from Hamburg and Altona (fig. 6). They often functioned as commission agents, especially for companies in London, Amsterdam, Berlin, and St. Petersburg.

The mint in Hamburg was not a competitor, since it was smaller and a bit more expensive. Standard coins and gold coins were produced on the basis of the shifting developments in exchange rates at the active money market in Hamburg, which attracted precious metals from Great Britain, Northern Europe, and Russia. Mints therefore either had to produce coins very fast or buy the metal from the customers and pay with the currency the customer wanted. The small mint in Hamburg was not able to do this. Due to its location, the mint in Altona had an enormous advantage compared to the mints in for example Berlin, Hanover, and Schwerin. Normally, the mint in Altona could outperform them due to the time factor and transportation costs.

Parts of the standard coins were produced for public institutions or the Nationalbank, which used most of them for either foreign payments or as silver reserves in the bank's vault. The huge production of standard coins for private customers meant that the state sometimes did not have to produce larger standard coins for domestic circulation. This was an economic advantage, but of course also meant that the state had less control with the distribution and circulation of these coins, and the production for private customers could make the state's silver purchases more expensive. In general, however, the production for private customers of both standard and gold coins was a significant advantage for the state's maintenance and development of the mints, coin circulation, monetary policy, and thereby Danish state building of the 19th century.

More than 2.6 million Danish gold coins were minted in Altona 1827-47 (fig. 7), and more than 2.4 million pieces were 2 frederikd'or or 2 christiand'or. With a theoretical ratio of 1 frederikd'or: 7.5 rigsbankdaler the production of gold coins 1827-47 was worth more than 37.5 million rigsbankdaler. It was an enormous amount, more than double the value of the larger standard coins produced at both mints 1830-47. Another comparison, the income of the realm was around 15 million rigsbankdaler in 1835. The many gold coins were almost entirely produced for private customers, and they were practically all from Altona and Hamburg. They needed and used the Danish gold coins outside the realm for international trade.

With its large-scale production of gold coins the mint in Altona became involved in the international, primarily east-west going, streams of precious metals. The production was made possible through the presence of gold and the demand for 1) re-coinage of especially British, German, or Russian gold coins and 2) coinage of gold bullion. Significant parts of the gold came to Hamburg and Altona from the west, especially from Great Britain that had a gold standard, but for example also from the Netherlands. Gold flowed to Hamburg almost automatically, in the 1830s the Danish economist M.L. Nathanson (1780-1868) described the

situation this way: “Goldbarren, die man am Freitagsabend von London absendet, schon am folgenden Freitag durch die Altonaische Münze in Frederiksd’or verwandelt sieht.”⁷

The gold coins were particular for use in Northern Germany/Prussia/Pomerania and Russia. It mainly had to do with grain, wool, and other raw materials, which were purchased for the emerging British industry. Payments also went from east to west, since many British manufactured goods were sold in or imported through Hamburg. Many of the new Danish gold coins were probably quickly re-coined abroad and then returned to Hamburg as foreign gold coins. The gold that came to the mint from the west was often bullion or British gold coins (sovereigns), while the gold from the east frequently was Russian gold coins (imperial) or different German gold coins.

The First Schleswig War

The First Schleswig War (1848-50) started with the formation of the Provisional Government for the Duchies on the 23rd of Marts 1848 and its conquest of the fortress in Rendsburg at the border between Schleswig and Holstein on the next day. Already on the 27th of Marts 1848 the royal mint in Altona and parts of its precious metals were without violence taken over by the provisional government, who used the mint for melting and a minor production of copper coins and medals during the war.

The mint continued the production for private customers during the war. More than 700,000 gold coins (almost exclusively 2 christiand’or) were minted, and this was a substantial part of the little more than 4 million gold coins produced in the entire realm 1827-70. Many imperial) were re-coined in Altona in the last years of the 1840s, and the mint also produced some speciedalers for private customers in 1848.

Some of the provisional government’s first legal actions were to forbid the rigsbank notes and cancel the introduction of the rigsbank standard. The duchies’ old courant standard was reintroduced, and the Prussian thalers’ official exchange rate was raised from 39 to 40 schillings courant. Especially in the beginning of the war, the Altona mint was used in the provisional government’s monetary policy. The government wanted to eliminate the rigsbank coins and at the same time reintroduce or improve the courant coins’ situation in the duchies, a policy opposite of the kingdom’s monetary policy in the 1830s-40s. Many foreign coins (courant coins and Prussian thalers) found their way into the duchies during the war. Apparently, the rigsbank coins quickly disappeared from circulation in the duchies, but this was not due to the mint in Altona, which seems to have melted less than 100,000 rigsbankdaler in rigsbank coins – and most of these coins were already in the mint’s vaults, when the mint was taken over.

The kingdom won the war and regained control over the mint in Altona. Both the Ministry of Finance and the mints started to work on reverting monetary policy to the track of the 1840s. The monetary policy of the provisional government was cancelled 1850-51, and the legislation from the 1840s was reintroduced. The battle against the courant and foreign coins started again, but the situation had deteriorated through the war, especially since the provisional government had issued notes, the so-called Kassen-Scheine, and allowed large amounts of foreign courant coins and Prussian thalers to enter the Duchies’, not least Holstein’s, circulation.

The reform of 1854 – the realm standard

In the spring of 1853, the Ministry of Finance seriously started working on the reorganizing of the post-war monetary system and again on the creation of a homogeneous

⁷ Quoted from Axel Ernst: *Christiandorer og andre Guldmønter, Nordisk Numismatisk Unions Medlemsblad*, Copenhagen 1956, 40-43, p. 42.

and common monetary system in the kingdom and the duchies. The notable economic upswing due to high grain prices during the Crimean War (1853-56) made the task easier.

From the 1st of January 1854 public offices were not allowed to receive foreign coins, and everybody in the realm should accept all types of rigsbank coins. This legislation should pave the way for the introduction of the realm standard in 1854, which led to the then largest monetary operations in the history of the realm, when measured in output per time. The realm standard was introduced in February 1854 and completely changed monetary matters in the duchies. It had the same purpose as the reforms before the war, but this time the government's gloves were off – almost no respect was paid to the duchies. The 1854 realm standard was a silver standard, and there were no thoughts about gold. Its standard was 18½ daler of one mark fine silver, which was exactly the same as the rigsbank standard from 1813, but the name of both the coins and of the unit of account was changed from rigsbankdaler to rigsdaler. The reform should not be associated with the old state-owned bank or 1813-reform, which were hated in the duchies, but create a new common monetary system consisting of 2, 1, and ½ rigsdaler as standard coins and 16, 4, 1, and ½ skilling as small coins, only the later two were not silver coins. The courant coins were no longer legal tender.

In other words, the legislation meant that the new coins (and some of the older rigsbank coins) should constitute the entire coin stock, and that the domestic courant coins should be eliminated (withdrawal, melting, and stop being legal tender), and that foreign coins should be kept out of the domestic coin circulation. As a result, some hanseatic cities quickly excluded Danish courant coins from their circulation, so lots of old Danish courant coins found their way into primarily Holstein from Hamburg, Lübeck, and others places. The large-scale withdrawal and re-coinage significantly affected the circulation, so the mints should on a weekly basis 1854-56 let the public know, how work was continuously being done to supply the realm with new, quality coins. During the reform, the mints sometimes worked around the clock for months with massive withdrawals, sorting, counting, shipping, packing, melting, sale, and buying of coins and the re-coinage and new coinage. The large-scale withdrawals started already in 1853 and led to a shortage of small coins, especially in the duchies. Therefor new small coins were issued from August 1853, and significant amounts of primary 1, 4 and, 16 skilling were issued 1853-57.

In February 1854, the Ministry of Finance needed the two mints' full silver capacity for the reform, which made coin production for private customers impossible. The reform consisted of different operations, and the enormous production of new standard coins (½, 1, and 2 rigsdaler) from the beginning of 1854 to the beginning of 1856 was the most important. Almost 19 million rigsdaler in standard coins were produced these two years, which was almost a third of the value of the domestic silver coins produced 1813-72 (fig. 8).

The reform required lots of buying and selling of huge amounts of silver and coins in Hamburg, which called for both time and a talent for this type of business. The Ministry knew it was necessary to take advantage of the shifting exchange rates at the money market in Hamburg to carry out the reform. The rates should continuously be monitored and used with regards to withdrawals, introduction of new coins, silver trade etc. The later mint director and board member of the Nationalbank, Moritz Levy (1824-92, fig. 9), was chosen to perform this important task. He was then a principal at the Office for Public Accounts and had previously worked at the important banking house L. Behrens & Söhne in Hamburg. He was without doubt the right man for the job, and he was during the reform employed as *monetary agent* with an office at the mint in Altona, very close to both the money market and the practical operations at the mint.

Danish export led to good exchange rates on Danish standard coins. Levy should use these fortunate rates to make the reform as cheap and efficient as possible. He primarily sold new realm coins and other types of currency against Hamburg banco thalers, which he then used to purchase fine silver. This silver was alloyed with withdrawn coins and turned into new standard coins; this way the copper in the withdrawn coins was not lost.

Levy turned out to be very skilled as a broker of precious metals and money, successfully using the shifting rates and buying and selling different types of foreign and domestic gold and silver coins, bullion, and different types of paper notes and bills. May-December 1854 he managed to buy huge amounts of silver and to sell c. 3.5 million rigsdaler in new standard coins, c. 1.6 million rigsdaler in notes, and about 210.000 Prussian thalers. On the 31st of December 1854, he had a profit of 85.000 rigsdaler, so the transactions were this far without losses – and the profit could cover parts of the loss of melting down.

Levy's transactions 1854-56 on the market in Hamburg were one of the reform's prerequisites. He bought 137-138 tons of fine silver for the mint in Altona and 50-51 tons for the mint in Copenhagen, and the mints generally did not lack fine silver during the reform. The almost 190 tons was an enormous quantity of silver. The annual world production of silver was c. 900-1,000 tons in the 1850s, and the production at the silver mines in Kongsberg, Norway was c. 200 tons in total 1835-1875. Levy especially purchased silver by selling c. 10.5-11 million rigsdaler in 1 and 2 rigsdaler coins, c. 640,000 Prussian thalers, and a few thousand Danish gold coins. The reform was through the 1850s a monetary success; the court standard and foreign coins were almost completely eliminated and the realm standard gained more and more ground.

A new metal for the lowest denominations, $\frac{1}{2}$ and 1 skilling, also became part of the reform. Many countries stopped producing copper coins in the second half of the 19th century. Instead they used bronze (different alloys of copper, tin, and zinc). In Scandinavia copper coins had been used for several hundred years, while bronze was a new coin metal, which was used from 1855, 1856, and the 1860s in Sweden, Denmark, and Norway respectively instead of copper for the smallest denominations. Bronze was an improvement since it was stronger and harder than copper, and the coins got a sharper stamp making it more difficult to counterfeit them. It was also easier to cast bronze than copper, and the bronze alloy was cheaper. The mint in Paris had for some years conducted large-scale production of bronze coins, and before starting bronze coinage in 1855-56 both Sweden and Denmark obtained information from Paris.⁸

Relatively few coins were produced in the realm from 1857-58 until the reforms in the 1870s. The main reasons were the 1) extensive coinage 1853-57, 2) the exchange rates of Danish standard coins in Hamburg, which made it economically unfavourable to produce standard coins, 3) the financial crisis of 1857; the crisis hit Hamburg very hard and caused an almost complete stop for the production of gold coins for private costumers at the mint in Altona, 4) the dismantling and closure of the mint in Altona 1863, and 5) the loss of the duchies in 1864.

Der Wiener Münzvertrag of 1857 strengthened the Prussian thaler and included gold coins ($\frac{1}{2}$ and 1 kronen) for trade. The demand for Danish gold coins produced in Altona for international trade declined, and the private costumers did not return to the Altona mint when the financial crisis of 1857 was over. A significant mint almost without work 1858-63 was expensive in maintenance etc. This and the more and more tense political development between the kingdom and the duchies were the main reasons for the closure of the mint in the second half of 1863.

The duchies were separated from the kingdom as a result of the Second Schleswig War in 1864, and the problematic relationship between the monetary systems in the kingdom and the duchies was then completely eliminated: From 1864, the Prussian monetary system was introduced in the duchies, and the kingdom had a small, but very homogeneous silver-based monetary system.

⁸ The chemist Bernhard Levy (1817-1863) was born in and studied chemistry in Copenhagen, became professor in Berlin, then mint director in Bogotá, Columbia, and he was in 1853 after several years of work in Paris employed at the Paris mint. He was in charge of the new French bronze coinage, and he sent a report about bronze coinage to the Danish Ministry of Finance in spring 1856. The report was perhaps caused by an inquiry from the medallist F. Krohn at the mint in Copenhagen.

The reforms in the 1870s – gold standard and a new monetary system

The relatively stable ratio between gold and silver started to change in favour of gold after the middle of the 19th century (see other papers in this volume). Countries with silver or bimetallic standards paid special attention to this. In Scandinavia, this international development led to the establishment of a gold standard in the 1870s.

The first and second Scandinavian Economic Meeting, where Denmark, Norway, and Sweden discussed common monetary problems, took place in 1863 and 1866. Monetary problems were intensified and accelerated around 1872 due to the unification of the German states and the German victory in the war with France 1870-71. Germany got 5 million gold franc as indemnities, which made a German gold standard possible. If Germany changed standard and sold enormous amounts of silver, silver prices would fall dramatically. The Danish response to the potential development in Germany was appointment of a Danish monetary commission on the 1st of June 1872. Its purpose was to examine whether it was reasonable and possible for Denmark to change the metal base of its monetary system. In other words, it was obvious for the Danish government that the silver standard would most likely be unsustainable.

Norway and Sweden also acknowledged this, and the third Scandinavian Economic Meeting in Copenhagen July 1872 was primarily a discussion of the remaining monetary possibilities for the three Scandinavian countries: 1) Join the Latin Monetary Union, 2) join the German Monetary Union, 3) join the Sterling area, 4) create a completely rational gold standard with the so-called gram coin, and 5) create an independent gold standard based on their old silver standards.

The Latin Monetary Union was founded in 1865 between Belgium, France, Italy, and Switzerland, while Greece did not join until 1868. It was a bimetallic union, which became more and more problematic due to the development in gold and silver prices. At the meeting, the bimetallic standard was considered both practically and economically unreasonable, and this was the main reason for the rejection of the Latin Monetary Union.

The German Monetary Union was founded on the 4th of December 1871 as part of the unification of the German states. On the meeting in Copenhagen 1872, both the Norwegian and Swedish participants argued that it would be economically favourable to join the German Monetary Union. But the Danish delegates, who by far outnumbered the Norwegian and Swedish ones, remembered the war and the defeat in 1864. They stated several national and sovereignty related considerations and thereby managed to avoid further discussion about joining the German Monetary Union.

It was on the meeting unanimously decided that one of the aims was the introduction of the metric system. This position was crucial for the rejection of a possible connection to the Sterling area, although it was the world's most widely used system, and Great Britain was a major trade partner.

Any connection to an existing system was not possible or desirable, so the three countries decided to create a new system. The main conflict of the meeting was about this new gold system. Should it be as rational as possible with regards to weights and values, or should it be as close to the old Scandinavian silver systems as possible?

The consequences of the most rational way of thinking required a main standard coin weighing five grams. With a fineness of 90% such a coin would be very easy to use in foreign trade, as it contained exactly 4.5 grams of gold. Several persons wanted to put an end to the different old and now irrational weights and values, which were used in Scandinavia; an average Swedish rigsdaler did e.g. in 1870 contain c. 6.3761 grams of fine silver. The gram coin would probably become an internationally recognized and used trade coin, while a coin based on the Scandinavian silver standards did not have any possibilities internationally.

Despite the fact that the leading economists argued well and wisely for the gram coin, the proposal was not adopted. Less visionary forces managed to have another proposal

adopted with overwhelming majority before the gram coin proposal was finally presented. Their proposal was 1) to adopt a gold standard as soon as possible, 2) to introduce the metric system, and 3) to establish consistency between the monetary systems in the three countries.

This proposal shows the existence of a strong desire to solve the monetary challenges in collaboration. Apparently, the main reason was that Sweden had a problem with the existing relationship between the three silver standards. Coins from the three countries circulated across the borders, since one Norwegian speciedaler almost completely equalled two Danish rigsdaler, which corresponded very well to four Swedish rigsdaler. The Swedish central bank continuously lost money on this circulation, since four Swedish rigsdaler contained 25.5044 grams of fine silver, while two Danish rigsdaler and one Norwegian speciedaler contained 25.2816 and 25.2966 grams of fine silver respectively. The new system should eliminate any difference in monetary standard between the countries.

The meeting ended with the establishment of a Nordic monetary commission, which should investigate, how consistency between the three monetary systems could be established through adoption of a gold standard. The commission's proposal was to base the gold standard on the existing systems in order to prevent the public from any unnecessary discomfort. This proposal was presented the 20th of September 1872 and was adopted by the Danish monetary commission, which on the 12th of December 1872 presented a proposal for a new Danish coin act.

Denmark's, Norway's, and Sweden's new standard coins should be pieces of 10 and 20 krone in a gold alloy of 90 % gold and 10 % copper. 1 kilogram of gold should be coined into 248 pieces of 10 krone coins or 124 pieces of 20 krone coins. The unit of account should be one tenth of a 10 krone and called one krone, which should consist of 100 øre. Both krone and øre are old Scandinavian coin denominations. The exchange ratio between gold and silver was fixed at 1:15.5, so the relationship between the old and new system became the following: one Swedish rigsdaler equalled one krone, one Danish rigsdaler equalled two kroner, and one Norwegian speciedaler equalled four kroner.

On the 23rd of May 1873, the coin act was passed in Denmark, and it was introduced the 1st of January 1875. The basis of the Scandinavian Monetary Union of 1873 was also part of the reform. Norway did not join the union until 1875, since the Norwegian parliament (Stortinget) voted against this in 1873. Despite the rejection of the union, Norway introduced the gold standard, but for some years kept their old speciedaler as unit of account.

The extensive minting operations related to the reform called for thorough planning, if the mint in Copenhagen should be able to deliver the necessary amounts in time. 23 million rigsdaler of the 27 million rigsdaler in coins produced within the last 20 years was expected to be withdrawn. A production of 14.5 million rigsdaler in 10 and 20 krone gold coins, 8.35 million rigsdaler in silver coins (2 and 1 krone, 25 and 10 øre), and 200.000 rigsdaler in bronze coins (2 and 1 øre) was planned for the introduction of the new system. In the beginning, the 5 øre coin was not considered desirable, but it was produced already from 1874. The small mint in Copenhagen needed c. 5-6 years (283 weeks incl. repairs, paperwork etc.) to produce such an amount of coins, but it had to be done much, much faster; speed was essential for a successful implementation of the many changes in the fundamental monetary reform and the development in silver prices (fig. 10).

As the mint needed two years for the production of bronze coins, much time could be saved if the coin blanks were manufactured elsewhere. Therefore the mint started buying bronze blanks from Ralph Heaton & Sons in Birmingham in 1873. Contemporarily the Copenhagen mint started production of gold and silver blanks. When struck, the gold coins were handed over to the Nationalbank that played an important role during the reform; it e.g. helped with coin distribution and significant metal purchases.

In the period 1873-76, 43.5 million kroner in silver coins and a bit more than 200.000 kroner in copper and bronze coins were withdrawn. C. 40 % of these withdrawn silver coins were used at the mint in Copenhagen for the new silver coins. The commercial transactions,

which made it possible to carry out the reform, were primarily conducted through C.J. Hambro & Son in London. Around 60 % of the withdrawn silver coins were sent to London, melted, and sold against British pounds, which were then used to buy gold in London. It was not cheaper to have the coins melted in London, but the procedure meant that the mint in Copenhagen saved time. From London, the mint in Copenhagen received almost 25 million kroner in gold (86.5 % in bullion and the rest in foreign coins) intended for the new 10 and 20 krone coins. This was probably the first time in several centuries that a large-scale monetary reform was conducted in the realm without massive deliveries of precious metals from the mines in Kongsberg or the market in Hamburg.

The major reforms of the 1870s created a new, very modern and well-functioning monetary system in Denmark/Scandinavia. It was an impressive task, which was carried out very successfully by the involved persons, mint etc. – the reforms altered most parts of the monetary system; it changed metals, values, names, unit of account, introduced the metric system and at the same time lay down the foundation for the Scandinavian Monetary Union.

Danish monetary history 1813-73

From the Napoleonic Wars to major reforms in the 1870s, Denmark went from state bankruptcy and a ruined, unstable, old, and silver based monetary system to a new, modern, homogeneous, and metric system based on a newly established Scandinavian gold standard, and to participation in the Scandinavian Monetary Union. A new stable monetary system based on the 1813-reform were established through crisis, recession, and beginning prosperity 1813-30s. Thereafter the monetary policy was about the creation of a common and homogeneous system in the entire realm. The Schleswig-Holstein Question made this almost impossible, but serious work on this monetary goal was done before and after the First Schleswig War of 1848-50, especially the comprehensive monetary reform of 1854 was of importance. The goal was more or less reached around c. 1860, but the loss of the duchies in 1864 changed the entire scene. From then on the main monetary problem in the small kingdom of Denmark was the changing ratio between gold and silver, which led to the successful changes in the 1870s that were decided in cooperation with Norway and Sweden.

The means and conditions for the development 1813-73 were manifold: the hard stabilizing policy of revaluation 1813-35, the duchies' exceptions from the 1813-reform, the loss of Norway in 1814 and of the duchies in 1864, the economic prosperity c. 1830-70s, the government's policy of state-building/nation-building, a central bank with monopoly on note-issuing, major monetary reforms with massive withdrawals and re-coinage, well-located industrialized mints with sufficient capacity, and huge markets for money and metals in Hamburg and London.

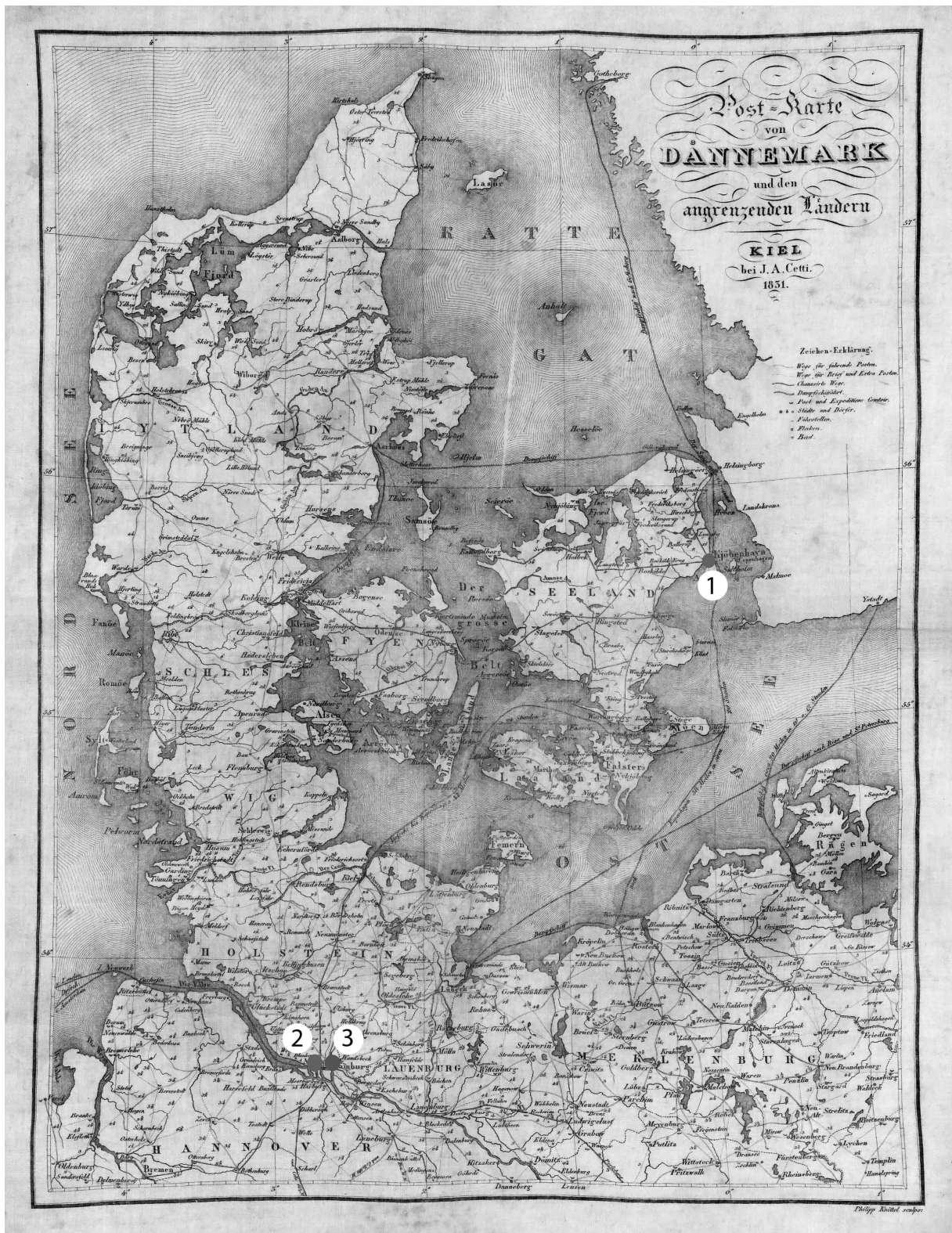


Fig. 1. The Kingdom of Denmark and the three duchies Schleswig, Holstein, and Lauenburg. The dots indicate location (not size), 1: Copenhagen; 2: Altona; 3: Hamburg. Map printed on a cotton handkerchief in Kiel 1831, J.A. Cetti, c. 36x48 cm.

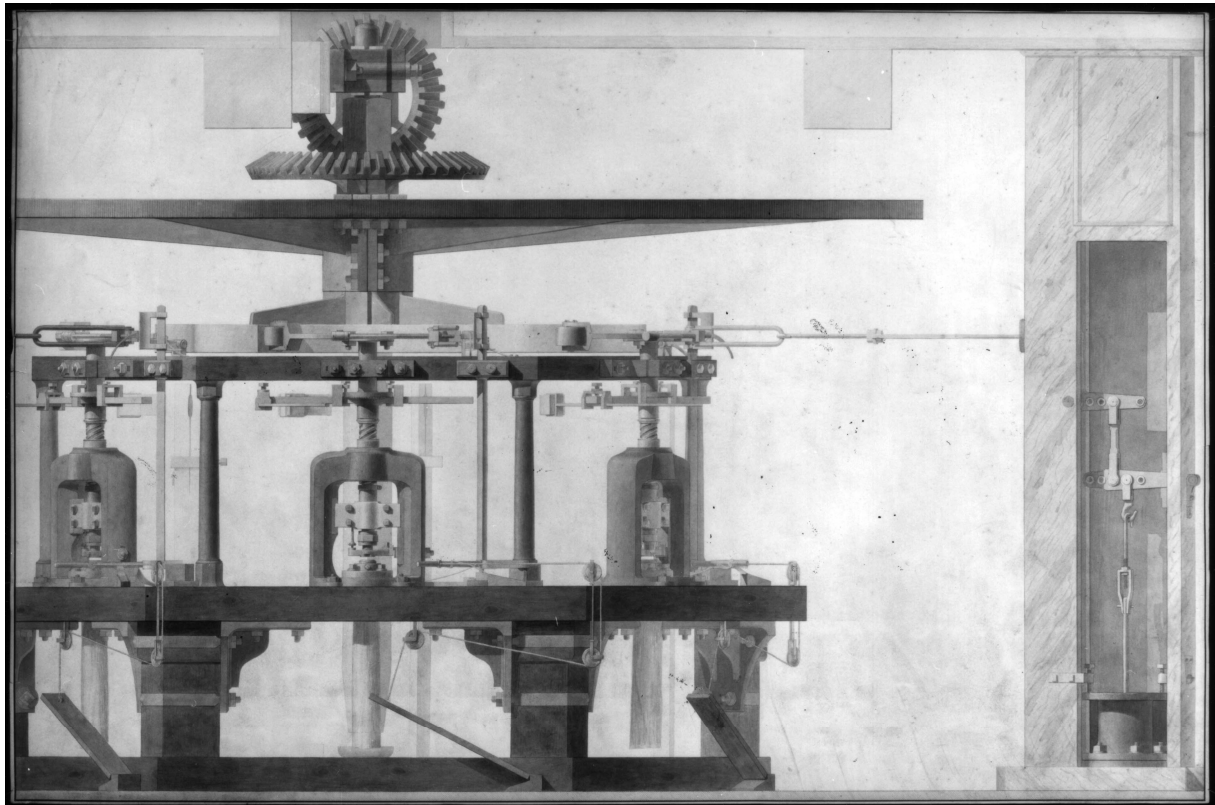


Fig. 2. Steam driven punching works with a total of six presses at the mint in Copenhagen, manufactured at Boulton's Soho Works before 1807. Unsigned drawing, probably from the 1820-30s, c. 70x100 cm.

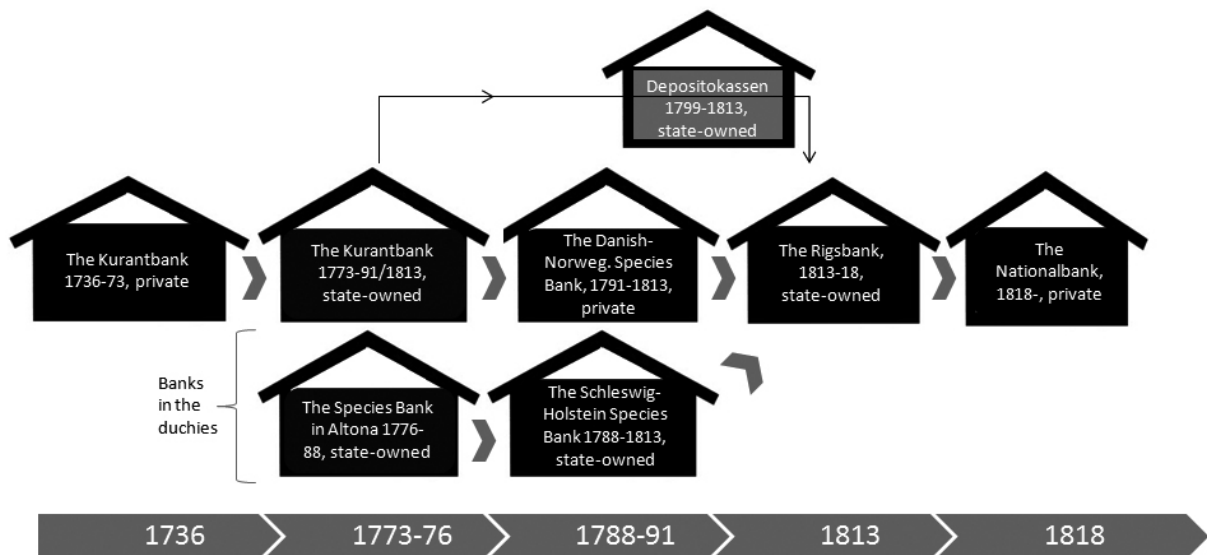


Fig. 3. Institutional development in Danish banking 1736-1818.



Fig. 4. Rigsbankdaler and speciedaler with portrait of king Frederik VI (1808-39), 30 and 37 mm.



Fig. 5. The second Uhlhorn machine in the realm. It was purchased by the mint in Altona 1842, transported to the mint in Copenhagen 1863 and in use until c. 1950-65, c. 80x200x185 cm.

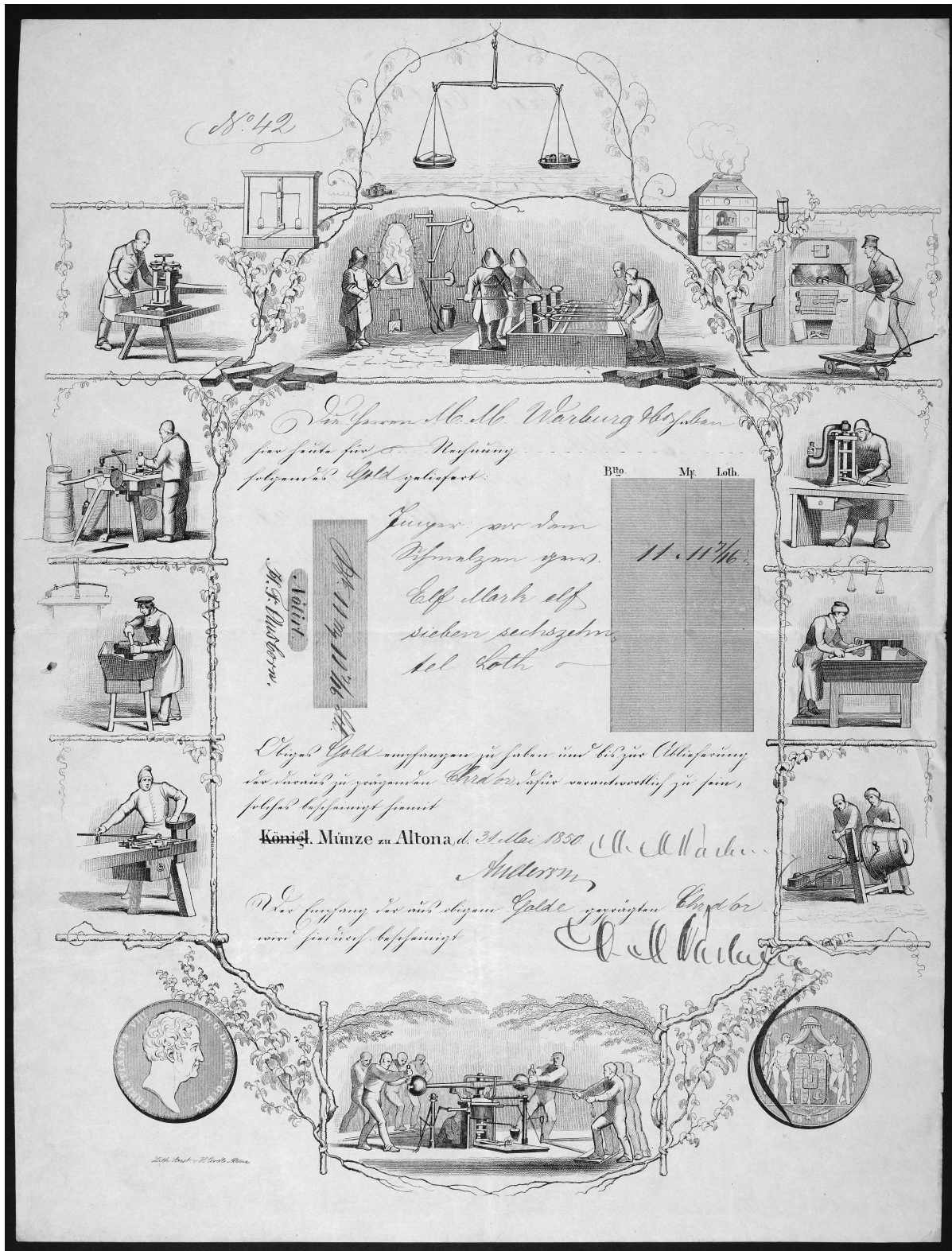


Fig. 6. Receipt for a gold delivery to the mint in Altona, c. 29x39 cm.

Used from c. 1847 and printed at Hans Cordts, Altona. This particular receipt was used in 1850 during the First Schleswig War (1848-50), note that the word Königl (Royal) is crossed out. The receipt states that M.M. Warburg the 31st of May delivered gold with a gross weight of almost 12 mark (11 mark 11⁷/₁₆ loth), which should be coined to *christiand'or*. The reverse of the receipt states that Warburg got 215 pieces of 2 *christiand'or* on the 4th of June 1850.



Fig. 7. 2 christiand'or from 1844 with portrait of king Christian VIII (1839-48), 26 mm, c. 13.2 grams.



Fig. 8. Coin types from the reform of 1854. They measure c. 37, 30, 26, 21, 16, 20, and 15 mm.



Fig. 9. Moritz Levy (1824-92), painted 1882 by H.C. Jensen (1836-1903).



Fig. 10. Coin types from the reforms in the 1870s. The gold coins measure 23 and 17, the silver coins between 15 and 31 mm, and the bronze coins 27, 21, and 16 mm.

Contents

Program of the Round Table	3
Michel Espagne (ENS, Paris), Introduction	5
Georges Depeyrot (CNRS-ENS, Paris) Presentation of the DAMIN program.....	7
Vladimir Bakhtin (Financial University, Moscow), The Influence of Wars on the Financial System of Russia in the 19th Century	11
Patrice Baubeau (IDHE - UMR 8533; Université Paris Ouest Nanterre; Sciences Po Paris), The Bank of France among its monies: commercial bills, banknotes, gold and silver, 1800-1914.....	21
Juan Castañeda (UNED Madrid), Pedro Schwartz (San Pablo-CEU University, Madrid), Non-monetary deflations and price stability in Spain (1868-1914).....	39
Keiichiro Kato (Ryutsu Kagaku University, Kobe), Japan's Change to the Gold Standard seen through Contemporary Newspapers in Kobe	61
Marina Kovalchuk (Far Eastern Federal University, Vladivostok), G. Arbuthnot's Reports on Japanese Currency, 1862-1863	69
Michael Märcher (National Museum, Copenhagen), Coins, metals, and reforms: A survey of Danish monetary history 1813-1873.....	77
Rita Martins de Sousa (Technical University, School of Economics and Management, Lisbon), The bimetallic monetary context in Portugal (1797- 1854)	97
Keiichi Nakajima (Keio University, Tokyo), The first coins of occidental type in Japan.....	113
Jürgen Nautz (Dep. of Economics, University of Vienna), Austro-Hungarian battles for the standard Academic and political debates about the currency reform in the 2nd half of the 19 th century	119
Emmanuel Prunaux (EHESS – Mission historique de la Banque de France), Achats de piastres et de métaux précieux par la Banque de France au début du XIX ^{ème} siècle.....	131
Josette Rivallain (Musée de l'Homme, Paris), La monnaie en argent en Afrique des monnaies de commerce à longue distance	147
Michael Schiltz (Institute for Advanced Studies on Asia, Tokyo), Japan's Choice for the Gold Standard, 1873-1897	157
Ekaterina Svirina (Financial University, Moscow), Russian monetary reforms in the 19th century.....	177
Stefano Ugolini (Scuola Normale Superiore, Pisa), The Structure of the World Bullion Market at the Time of the Emergence of the Classical Gold Standard: New Evidence 1864-1876	187
Contents.....	207