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Dunér, David

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ON THE DECIMAL: THE FIRST RUSSIAN TRANSLATION OF SWEDENBORG

David Dunér*

The first Russian translation of Emanuel Swedenborg has been discovered in the archives of the Russian Academy of Sciences in Saint Petersburg. It is a translation, from just before New Year 1725, of Swedenborg's proposal for the division of our coins and measures from 1719. Here I will sketch the background of the translation, the significance of Swedenborg's pamphlet, and how it became translated into Russian.

A Russian spy

As assessor in the Board of Mines, Swedenborg met in Stockholm a Russian historian and mining expert, Vasily Nikitich Tatishchev. Tatishchev travelled through Sweden during the years 1724–1726, collecting information about Swedish mining industry, manufactures, and other technological achievements. They met a couple of times and discussed mining and mineralogy, but also mathematics and metrological issues concerning the division of measures and coins. Tatishchev had an excellent knowledge about Siberian mining. He had been sent out by the czar Peter the great in 1720 to discover new ore deposits in Siberia. Swedenborg tells us in *De cupro* (1734) that Tatishchev found copper ore near the rivers Utka and Iset, near the city of Kungur, in Perm near the river Kama, by the monastery Piskoy, and that he founded the metal city Yekaterinburg. The same

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* David Dunér, born 1970 in Lidingö, Sweden, received a Ph.D. in History of Science and Ideas at Lund University, Sweden, in 2004. The title of the dissertation is *Världsmaskinen. Emanuel Swedenborgs naturfilosofi* [The World Machine. Emanuel Swedenborg's Natural Philosophy], and concerns Swedenborg's early mechanistic natural philosophy up to 1734. It will soon be published in English. In Spring 2002 he was visiting scholar in History of Science, Medicine, and Technology at Johns Hopkins University, Baltimore, Maryland; and in Fall 2002 visiting scholar in History of Science at Princeton University, New Jersey. Published the article "Swedenborg's Spiral" in *Studia Swedenborgiana*, no. 4, 2002. Currently he has a position as associate professor in History of Science and Ideas at Lund University. He is also secretary of The Scandinavian Swedenborg Society.

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year Tatishchev met Swedenborg's cousin, the cavalry captain Peter Schönström the younger, who was held as war prisoner in Solikamsk.[1] They had met before, at least once, but passing, on each side of the frontier of the battle of Poltava in 1709. Tatishchev was wounded, Schönström was captured and Charles XII fled. Even Schönström was interested in mining. Finally back in Sweden after the peace treaty, he wrote a report on the Siberian mining industry that Swedenborg also received.[2]

The Board of Mines was worried about the new competitor on the market of raw materials, and they discussed the possibility of sending some persons incognito to carry out espionage in Russia. The Russian mining industry was found to be more and more a serious competitor. Russia had similar interest in the Swedish mining industry. That was just one of the reasons why Tatishchev stayed in Sweden. By order of the czar he was to study the reputable Swedish mining industry, and obtain knowledge about the organisation and conditions of manufacturers and mints. He should also enlist Swedish professionals for the mining works in the Urals, and find places at Swedish mining works for young Russian apprentices. In a meeting in the Board of Mines in February 1725, when Swedenborg was present, Tatishchev handed over a map of Russian mining works in the Urals,[3] the same map Swedenborg inserted in *De ferro* (1734). Swedenborg also referred to Tatishchev in his manuscript *De sulphure* (ca 1724–1727) concerning a kind of pure sulphur in the mountains of Kazan.[4] Tatishchev can be called a political spy, not just an industrial spy, because apart from studying the mining industry, he was commissioned to find out, as it says in a report from 1726, "the obvious actions and hidden intentions of the Swedish government."[5]

In his studies of manufacturing works, Tatishchev even visited Stjärnsund in Dalecarlia in 1726, and was fascinated in a dam made of

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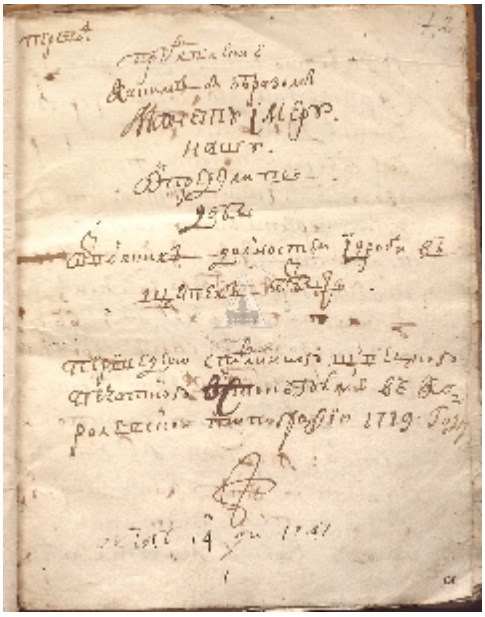
[1] Juri Küttner, "V. N. Tatiscevs mission i Sverige 1724–1726", *Lychnos* 1990, 112.

[2] The National Archives, Stockholm (RA), Bergskollegii arkiv, AI:77:1, 1f.

[3] RA, Bergskollegii arkiv, AI:71, 1223; Emanuel Swedenborg, *Regnum subterraneum sive minerale: De ferro deque modis liquationum ferri per Europam passim in usum receptis; Deque conversatione ferri crudi in chalybem; De vena ferri et probatione ejus; Pariter de chymicis præparatis et cum ferro et victriolo ejus factis experimentis &c. &c.*, Dresden & Leipzig 1734, 164–167.

[4] Emanuel Swedenborg, *De sulphure et pyrite*, The Royal Swedish Academy of Sciences, Stockholm (KVA), cod. 82 (83:2), 107.

[5] Tatishchev to the czarina Catherine I, 17 October 1726; cit. in Küttner, 119.



The first Russian translation of Swedenborg. *Predyavlenie kakim obrazom monetu i meru nashu opredlit daby otvsyakikh dalnostei i drobi v shchetekh otbyt* (1724), titlepage of the Russian translation of Swedenborg's *Förslag til wårt mynts och måls indelning, så at rekningen kan lettas och alt bråk afskaffas* (1719). Photo: Russian Academy of Sciences, Saint Petersburg.

wood and which was labour-saving and easy to repair, constructed by a famous "mechanicus"—Christopher Polhem.[6] Tatishchev also became acquainted with Swedenborg's brother-in-law Eric Benzelius the younger, with whom he discussed not only editorial questions, but also another issue firing the imagination more—the Siberian mammoth. The question had been raised after prisoners of war returned home and told about a strange animal in the Siberian soil.[7] In spring 1725 Benzelius asked Tatishchev, who had great knowledge of Siberia, if he could write an article about the mammoth for publication in the proceedings of the

[6] Küttner, 124–126.

[7] Leonard Kagg, *Baron Kaggs beskrifning på ett vattendjur i Obijströmen* (dec. 1722). Linköping Diocesan Library (LiSB), N 14a, nr 54; *Bokwetts Gillets protokoll*, utg. H. Schück, Uppsala 1918, 14/12 1722, 79.

Society of Sciences in Uppsala, *Acta literaria Sveciæ*.[8] Is the mammoth an infernal animal, the Behemoth in the Book of Job, an elephant driven away by the deluge or what? Tatishchev was asking. This is actually the only scientific work by Tatishchev published during his lifetime, which means that Swedenborg's Siberian facts in *De cupro* probably come from Schönström, though also perhaps through oral communication or documents handed over by Tatishchev.

At the archives of the Russian Academy of Sciences in Saint Petersburg there are some documents that describe Swedenborg's contacts with Russia.[9] In 1734 the Academy got a book package from Swedenborg consisting of his *Opera philosophica et mineralia*.[10] The Academy formed a group which had the task of valuating it and of finding its use for the Russian mining industry. They found that *De ferro*, beside it having an alchemical tint, was not an insignificant work, even if it was like a fragile rowing boat on the vast ocean; he had really ventured something.[11] The secretary of the Academy wrote back to Swedenborg, thanked him for his valuable research into the hidden secrets of nature, and invited him to correspond with the Academy.[12]

Thus this digression into Siberian metallurgy and palaeontology unveils an important aspect. It is that oral communication—the discourses that have forever faded out, that have been forgotten in historical re-

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[8] Vasily Nikitich Tatishchev, *Beschreibung von Mamontowa Kost oder Mamontz Knoche* (12/5 1725). LiSB, N 14a, nr 93, fol. 237–240; Tatishchev, "Generosiss. Dn. Basilii Tatischow Epistola ad D. Ericum Benzelium de Mamontowa Kost, id est, de ossibus bestiæ Russis Mamont dictæ", *Acta literaria Sveciæ* 1725, 36–43; Tatishchev to Benzelius, Stockholm, 20 January 1726 & 20 February 1726. Eric Benzelius, *Letters to Erik Benzelius the younger from learned foreigners* I–II, ed. A. Erikson, Göteborg 1979, II, 294f; *Bokwetts Gillets protokoll*, 122; Torgny Hag, "Karoliner och behemoter. 1700-talets svenska diskussion om mammuten", *Svenska Linnésällskapets Årsskrift* 1979–81, 66–68; Küttner, 149f.

[9] *Materialy* dlya istory Imperatorskoy akademy *nauk*, tom 2 (1731–1735), St. Petersburg 1886, 507–511.

[10] *Green books* V, no. 569.14.

[11] Swedenborg Library, Bryn Athyn (SLBA), S2 Ac12, 2; Russian Academy of Sciences, St. Petersburg (RAN), razryad V, opis 1–C, no 6, concerns Swedenborg's *Principia*, "Praesent. in acad. scient. d. 5. Novbr 1736".

[12] Russian Academy of Sciences to Swedenborg, St. Petersburg, 28 December 1734; Russian Academy of Sciences, "Ausgehende Briefe 1734–1735", fond 1, opis 3, no 19; *The letters and memorials of Emanuel Swedenborg* I, ed. A. Acton, Bryn Athyn PA 1948, 465.

search—have had greater impact than what we first suspected, hidden only in preserved written documents.

Proposal for the division of our coins and measures

The other issue Swedenborg and Tatishchev discussed was one concerning the decimal system and how to divide measures and coins. In October 1718, during the construction of the canal known as Karls Grav ("Charles's Ditch") outside Vänersborg, Swedenborg wrote a proposal for an octal numeral system, a new arithmetic with base eight, entitled *En ny räkenkonst*. The full title in English translation is "A new system of reckoning which turns at 8 instead of the usual turning at the number 10 whereby everything respecting coinage, weights, dimensions, and measures, can be reckoned many times more easily than in the ordinary way." This was an attempt to reform our way of counting, a task that seems to have amused both himself and the man who assigned it to him, Charles XII. The work is dedicated to Charles XII, yet not to a king but to "a profound Mathematicus."[13] Whether it should be sixty-four or eight instead of ten was the question. Which number is best suited as a base for counting coins, weights, and measures, while simultaneously being geometrical? An advantage of the number 8 is that it is "geometrical," unlike the number 10, in that 8 is equal to the cube of 2, and can be halved all the way down to 1 with no need for fractions. Moreover, octal arithmetic would correspond better to the way of counting and dividing coinage, weight, volume, and dimensions, all of which—with a few exceptions—could be derived from base 8.

But did Swedenborg himself believe in the mathematical content, did he believe in his octal system? Probably not. One of the major reasons for this assumption is a small work printed by Swedenborg in November

[13] Emanuel Swedenborg, *En ny räkenkonst som omvexlas wid 8 i stelle then wahnliga wid thalet 10, hwarigenom all ting angående mynt, wicht, mål och mått, monga resor lettare än effter wahnligheten uträknas*, Karls grav 1718, The Royal Library, Stockholm (KB), X 722, dedication; C. W. Oseen (ed.), "Ett manuskript av Emanuel Swedenborg", *Lychnos* 1937, 255; translation A. Acton, *A new system of reckoning which turns at 8 instead of the usual turning at the number 10 whereby everything respecting coinage, weights, dimensions, and measures, can be reckoned many times more easily than in the ordinary way*, Philadelphia PA 1941.

1719, almost exactly a year after the king's death. It was sold by the bookbinder Dalbeck's widow in Nygatan in Stockholm for 4 öre s.m. and had the title *Förslag til wårt mynts och måls indelning, så at rekningen kan lettas och alt bråk afskaffas* ("Proposal for the division of our coins and measures, so that counting can be facilitated and all fractions eliminated," 1719). Though written by Swedenborg, this is unusually clear, brief, and concise. Yet in this work Swedenborg advocates the decimal system!

> But if the division of coins, and also of measures, were according to the decimal, which is based on tens, then the stupidest person could count like the wisest; a peasant as well as a tax accountant. In addition, all trade and dealings, and the general and special economy of the realm, would derive incredible benefit and pleasure therefrom.[14]

The arguments for the decimal system resembled those applied to the octal system. If the systems for counting, coinage, and measures were all decimal, calculations would be easier and one could avoid fractions. Each species of coin would thus be divided into tenths, from one mark of pure silver, via the riksdaler, pieces of five, wittens, down to pennies. And the same decimal system is also suggested for volumes, from one load (*läst*) which is then divided into barrels, measures, jugs, and glasses. Coins and measures would thus be in symmetry with arithmetic. By adding or removing a zero one could obtain the amount of the desired kind. If one had different units they could easily be placed in a row to form one sum. In just one number it would be immediately possible to see the larger and smaller parts of the amount. There would be no need for conversion, fractions could be avoided, and people would be spared from mental toil. Knowing one unit, a person would instantly know all the others. If you knew, for example, what a load cost, you immediately knew the price of the other volumes into which it could be divided. The introduction of a decimal system would thus mean that

> no more fractions or circumstantiality would be needed in any calculation: trade and dealings and the country's economy, as regards income

[14] Emanuel Swedenborg, *Förslag til wårt mynts och måls indelning, så at rekningen kan lettas och alt bråk afskaffas*, Stockholm 1719, [2].

> and expenditure, would thereby find good arithmetic, order, and correctness; and an advantage over other nations in the world in all its counting and calculating.[15]

These eight pages "about the decimal in our coinage and measures," Swedenborg writes to Benzelius in November 1719, "will be my last word, since I notice that only Pluto and *Invidiae* [the Envies] occupy *hyperboreos*, and one secures greater fortune if one acts a fool rather than as a rational man etc."[16] Swedenborg is resigned to this. In Sweden only envy rules. Better then to be an idiot. With *Förslag til wårt mynts och måls indelning* it is clear that Swedenborg advocated a decimal system for counting and for the division of coins, weights, and measures. The question is whether Swedenborg had now changed his opinion as to the most suitable base for a numeral system, or if he perhaps had really preferred a decimal system all the time? The king's death was probably not without significance in this context. It now became possible to recommend a decimal system, probably because the dependence on Caroline absolutism was over. He no longer needed to show any consideration to Charles XII's numerical speculations and was no longer required to await his approval. It may very well have been the case that Swedenborg as a scientist had always—both before and after 30 November—regarded the decimal system as the most suitable, although it cannot be entirely ruled out that he made an about-turn, in the space of a few months, concerning the base for a numeral system.

The decimal system

What Swedenborg did know about, and what certainly served as a foundation for *Förslag til wårt mynts och måls indelning* and its decimal system, was that philosophers of nature wanted a logical and scientific system of measurement, and there were also Georg Stiernhielm's metrological ideas. The linear standard of the Linea Carolina—a line engraved

[15] *Förslag til wårt mynts och måls indelning*, [7].

[16] Swedenborg to Benzelius, Stockholm, 26 November 1719. *Opera quædam aut inedita aut obsoleta de rebus naturalibus* I, ed. A. H. Stroh, Stockholm 1907, 295;*The letters and memorials of Emanuel Swedenborg* I, 221.

on a square brass rod—is based on a decimal division, and in several manuscripts Stiernhielm describes decimal arithmetic.[17] He had originally had the intention to accomplish a complete decimalization of the measurement system and had advocated a decimal scale of length based on the smallest thing in the material world—the point. Ten points make a line. But the suggestion was ignored; it was still far too radical. It was not until the decree of 1733 that a decimal division was introduced for linear measurement, to be used alongside the traditional duodecimal system with twelve inches to a foot. In the circle around *Dædalus Hyperboreus* Stiernhielm was admired for his Linea Carolina and his Swedish poetry. In 1716–1717 Benzelius, Polhem, and Swedenborg discussed including a biography of Stiernhielm, "*Stiernhielms vita*," in the journal together with the Linea Carolina.[18] Swedenborg wanted to borrow Pehr Elvius the older's copy of the Linea Carolina and also asked him what he knew about it. Polhem returned several times to Stiernhielm's experiments, and studied and discussed his determinations of weight and measure.[19] In the spring of 1717 Maja and Mensa, as Polhem called his daughters Maria and Emerentia, brought a letter to Swedenborg in Stockholm. Even Sweden has geniuses, writes Polhem, referring to Stiernhielm:

> Although the Sun gives Sweden short and cold days in the winter, they are so much the longer and more delightful in the summer, so that southerners have nothing to boast about in this respect when the year is ended; in the same way, and although Sweden engenders the stupidest people that other nations rightly disdain, there are on the other hand such clever ingenia that other nations cannot surpass or teach, although these two extremes together do not do more than intermedia in other places or vice versa. [20]

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[17] Georg Stiernhielm, 'De numeris geometricis siue quantitatibus algebraicis'. KB, Fd 15, fol. 7; KB, Stiernhielm, X 727.

[18] *Opera* I, 256, cf. 267–269.

[19] *Christopher Polhems brev*, ed. A. Liljencrantz, Uppsala 1941–46, 46f, 49, 52–54, 62; *Christopher Polhems efterlämnade skrifter* III, ed. A. Liljencrantz, Uppsala 1952–53, 115, 124.

[20] Polhem to Swedenborg, Stjärnsund, 27 March 1717. *Christopher Polhems brev*, 127.

A decimal division of weights and measures had been advocated by many scientists and mathematicians, including, in Sweden, Anders Bure and Mathias Björk, but above all by the Dutchman Simon Stevin, who put forward the decimal counting at the end of the sixteenth century, which was later introduced to Sweden by Martinus Erici Gestrinius.[21] Polhem too was a supporter of the decimal system. In *Wishetens andra grundwahl* Polhem writes about linear measure, that craftsmen divide the Swedish foot into 12 inches, but surveyors "otherwise more correctly into 10 *tolls*; one toll into 10 lines, and a line into 10 points."[22] He also mentions that "a measuring rod is 10 foot; a measuring tape 10 rods or 100 foot, and the decimal cubic foot, a jug equivalent to 100 cubic tolls."[23] In another context he referred to Swedenborg's *Förslag til wårt mynts och måls indelning* and wrote that a decimal division is more natural than the artificial and unnecessary fractions, "I, like all wise Mathemati[ci], regard this division as the most perfect."[24]

Aftermath of Swedenborg's proposal

In *En ny räkenkonst* Swedenborg wrote that it was not necessary to introduce a decimal system as the learned recommended. The same advantages could be obtained through an octal system. But the time was not ripe to introduce a decimal system across the board, neither in Stiernhielm's nor Swedenborg's time. Geometrical measure, that is, a decimal linear measure, was nevertheless used by land surveyors. The only examples of decimal division to be introduced were the subdivision of the foot and the

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[21] Frans W. Hultman, "Svenska aritmetikens historia", *Tidskrift för matematik och fysik, tillegnad den svenska elementar-undervisningen*, vol. 3, Uppsala 1870, 7f; Ludvig B. Falkman, *Om mått och vigt i Sverige; Historisk framställning* II, Stockholm 1885, 15f; Sam Owen Jansson, *Måttordboken*, Stockholm 1995, 60.

[22] Christopher Polhem, *Wishetens andra grundwahl til vngdoms prydnad mandoms nytto och ålderdoms nöje; lempadt för vngdomen efter theras tiltagande åhr, vti dagliga lexor fördelt. Första boken innehållande en liten försmak af thet, som widare följandes warder*, Uppsala 1716, § 21; cf. *Christopher Polhems brev*, 96.

[23] Polhem 1716, §§ 22, 29, 31.

[24] Polhem, 'Om Sveriges lösa ägendom', *Christopher Polhems efterlämnade skrifter* II, ed. G. Lindeberg, Uppsala 1951, 166; cf. Polhem 'Arithmetica eller Reknekonst'. KB, X 705:1, fol. 70f; Polhem, 'De mensura comuni'. KB, X 706, fol. 37f.

definition of the volume of a jug.[25] Nor was 1718–1719 the best time to carry out a reform, in view of the economic difficulties and the widespread annoyance about the emergency coins. But Swedenborg's *Förslag til wårt mynts och måls indelning* did not pass unnoticed. It was discussed in Bokwettsgillet (Society of Sciences in Uppsala) and reviewed in *Acta literaria Sveciæ* for 1720, and it appeared in a new edition as late as 1795.[26]

In December 1741 Swedenborg donated to the Royal Academy of Sciences a copy of his *Förslag til wårt mynts och måls indelning*, which the academy then delegated to the president of the Board of Trade, Anders von Drake, to peruse.[27] Swedenborg's colleague in the academy, the surveyor Jacob Faggot, published an essay in the proceedings of the academy the following year entitled "Om Tijotälning, eller Decimalers häfd i Bokhålleri och Räkning, som rörer Mått, Mål, Wigt och Mynt, utan rubning i de wanlige inrättningar" ("On counting in tens, or the decimal tradition in accounting and arithmetic, concerning dimensions, measures, weights, and coins, without disturbance to the accustomed institution"). Among other things, Faggot proposed emulating the Chinese, the only people who used the decimal system, and dividing the coinage decimally from rundstycken, slantar, and daler to purses, bags, and sacks of money for the really wealthy. He also mentions Swedenborg's and Charles XII's discussions of a new numeral system:

> Indeed I have been recently informed that the late King Charles XII intended to implement such a system, following the method suggested by a learned man, had not death unfortunately intervened. For the rest, I have also, since this was composed, been presented by a good friend with a well-wrought publication, under the name of a proposal for the division of our coinage and measures, printed in 1719: both the manner and the utility of the decimal system are clearly revealed therein. But the method

[25] Rolf Ohlon, *Från Stiernhielms Carl-Staf till metern*, Stockholm & Borås 1989, 124. No *chetyrnadtsatyj. Vasiliy* decimal system came into existence until the 1855 statute on weights and measures. Lars Nystedt, "Metersystemet – en pigg tvåhundraåring", *Tid, längd och vikt*, eds. I. Elmqvist & J. Florén, Stockholm 1999, 74.

[26] *Bokwetts Gillets protokoll* 22 January 1720, 11; *Acta literaria Sveciæ* 1720, 22; *Neue Zeitungen von gelehrten Sachen*, Leipzig, 2 June 1721, 352.

[27] *Svenska Vetenskapsakademiens protokoll för åren 1739, 1740 och 1741*, ed. E. W. Dahlgren, Stockholm 1918, I, 364, & II, 155.

> adopted for this in the present work is so vastly different from the aforementioned fine proposal, that the aim here is to retain the established institutions.[28]

It was Swedenborg's *Förslag til wårt mynts och måls indelning* that Faggot's good friend (perhaps Swedenborg himself?) had presented to him. Perhaps Faggot had also come across Jöran Nordberg's biography on Charles XII, where Swedenborg's account of the king's mathematics is inserted. But no extant sources say anything about Charles XII and Swedenborg having discussed the introduction of a decimal system as Faggot states.

Tatishchev, visiting Sweden in the mid-1720s, discussed the advantages of the decimal system with Swedenborg.[29] He himself tried, without success, to introduce the decimal system for weights and measures in Russia. Swedenborg then gave a copy of his work to Tatishchev, who immediately had it translated and sent to the imperial cabinet in Saint Petersburg just after New Year 1725.[30] The translator may have been a professional interpreter employed by the Swedish state, who also could have been available during Tatishchev's visits at the Board of Mines. In the accompanying letter to Ivan Cherkasov, Tatishchev gives an account of his meeting with Swedenborg, whom he describes as a prominent physicist, mathematician, and mechanic. Tatishchev also acquired a complete collection of *Dædalus Hyperboreus*. From other sources I have found that Tatishchev also had other books by Swedenborg. In his library we still can find a copy of Swedenborg's *Opera philosophica et mineralia* (1734) in three

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[28] Jacob Faggot, "Om tijotälning, eller decimalers häfd i bokhålleri och räkning, som rörer mått, mål, wigt och mynt, utan rubning i de wanlige inrättningar," Kungliga vetenskapsakademiens handlingar III, 1742, 56; cf. Faggot, *Rön af mätekonsten til utletande af hwarjehanda kärils innehåll uti swenskt mått och mål*, Stockholm 1739.

[29] Küttner, 121, 159; Aleksandr Isayevich Jukht, *Gosudarstvennaya deyatelnost V. N. Tatishcheva v 20-ch—nachale 30-ch godov XVIII v.*, Moscow 1985, 201f.

[30] Tatishchev to Cherkasov, Stockholm, 2 January 1725. A. I. Jukht (ed.), *Nauchnoye nasledstvo. Tom chetyrnadtsatyj. Vasiliy Nikitich Tatishchev. Zapiski. Pisma 1717–1750 gg.*, Moscow 1990, 105.

parts.[31] He seems also have owned a copy of Swedenborg's book on algebra, *Regel-konsten* (1718).[32]

The manuscript mentioned in the letter to Cherkasov is the very first translation of Swedenborg into Russian—and it still exists, discovered by me in the archives of the Russian Academy of Sciences in June 2009.[33] Neither James Hyde, nor Alfred Acton knew about its existence. This document was not mentioned in the correspondence between Acton and the archives 1927.[34] It is not included in Hyde's bibliography and Wainscot's addition, or in the "Green Books," The translation of Swedenborg's proposal, *Förslag til wårt mynts och måls indelning*, can be found in a codex of Tatishchev's notebook to his work in geometry. It consists of ten pages and has the title: *Predyavlenie kakim obrazom monetu i meru nashu opredlit daby otvsyakikh dalnostei i drobi v shchetekh otbyt*. The title page is in accordance with Swedenborg's title, with a later added date by another hand, probably a librarian, October 14, 1747. According to Tatishchev's letter to Cherkasov it was written in the end of 1724. This actual manuscript seems not to be the one sent to the imperial cabinet, but rather a first sketch or a copy for Tatishchev's personal use.

This very first Russian translation of Swedenborg unveils an interesting story about Swedenborg's contact with a Russian spy and his interest in Siberian mining works. Swedenborg's proposal for implementing a decimal system for coins and measures was a visionary idea ahead of his time that would not be a reality in Sweden until 1855. Already in his time his proposal got attention in Sweden, and also in Peter the Great's Russian Empire. ❑

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[31] Russian Mining Institute, Saint Petersburg; B. G. Bauman & D. K. Salachutdinova (eds.), *Knigi Tatishcheva V.N. v glavidi biblioteke Leningradskogo gornoga instituta. Katalog*, Saint Petersburg 1992.

[32] G. G. Bauman, *Biblioteka Vasiliya Nikitiga Tatishcheva. Rekonstruktsiya*, Saint Petersburg 1997.

[33] Vasily Nikitich Tatishchev, *Tetradi Tatishcheva k ego radotash po geometrii*. RAN, razrjad II, opis 1, no 211, pages 8–12.

[34] RAN, 1927 Spravka o ego literialna v Akademii Nauk i v … fonda 2, opis 192 f, n 2, l. 157–159, 209–211.