

## THREE CATALOGUES FROM THE FERSMAN MINERALOGICAL MUSEUM ARCHIVE

Daria D. Novgorodova

IRAS Fersman Mineralogical Museum, RAS, Moscow, [dnovgorodova@gmail.com](mailto:dnovgorodova@gmail.com)

The first master catalogues of the Mineral Cabinet of the Kunstkamera which became the fundamentals of the collection of the Mineralogical museum of Academy of Science are reviewed in this article. These are: the first printed Mineral Catalogue from 1745 (compiled by I.G. Gmelin, I. Amman and M.V. Lomonosov) and handwritten catalogues from the Mineralogical museum archive – by J.G. Lehmann (1766) and J.G. Georgi (1789). Also the Mineralogical museum archive preserved the Catalogue of the Gottwald's Museum whose collection was acquired by Peter the Great for the Kunstkamera in 1714.

33 references.

Keywords: mineral collections, science history, the Fersman Mineralogical museum RAS, The Kunstkamera, catalogue, Lehmann, Georgi, Gottwald, Lomonosov, mineral systematics.

*This or any other procedure is merely a dam against the spring tide of memories which surges toward any collector as he contemplates his possessions. Every passion borders on the chaotic, but the collector's passion borders on the chaos of memories.*

Walter Benjamin.

Unpacking my Library.

Over a period of XVIII century the master catalogues of the collection of the ("Fersman" – at present) Mineralogical museum of the Russian academy of Science ("Mineral Cabinet of the Kunstkamera" – in the past) were compiled several times in Latin. The first description of the mineralogical collections of the Kunstkamera, the "Mineral Catalogue" was published in 1745 within the master Catalogue of the Imperial museum – Kunstkamera (Musei Imperialis..., 1745). The authors, academicians I.G. Gmelin, I. Amman and M.V. Lomonosov, were facing a difficult task: to give mineralogical definitions and describe the specimens and to compile the uniform Collection of the Mineral Cabinet from chaotic and scattered rarities dispersed over collections acquired during several decades.

Next catalogue of the mineral collection of the Kunstkamera was compiled by Johann Gottlob Lehmann<sup>1</sup> (Lehmann, 1766). After collections were moved in 1766 to the renovated after the fire Kunstkamera building, the Mineral Cabinet displays were arranged according to the mineralogical classification by J.G. Lehmann (Backmeister, 1779). Not only the structure of exhibition changed: the mineral collection was replenished with multiple new specimens. At the times of the first catalogue of the mineral collection of the 1745 was under compilation, the Mineral Cabinet occupied three halls of the

Kunstkamera – PP, QQ, RR – and was accommodated by 16 display cases (Palaty, 1744; Lomonosov, 1954.). After twenty years, the united mineral collection of the Kunstkamera was divided into three parts: the Russian Mineral Cabinet, the Foreign Mineral Cabinet and the "Old" Mineral Cabinet or the "Grotto" – a picturesque room decorated with shells, fossils, minerals and other items regarding Mineral world or ore mining (Backmeister, 1779; Belyaev, 1793).

Conventionally we date the considered Lehmann catalogue to the 1766 – according to the data by A.F. Gebel, the keeper of the Mineralogical museum of the Academy of Science through 1860–80s (Gebel, 1886). Here we review the very same Lehmann's catalogue from the Archive of the Mineralogical museum, with remarks by A.F. Gebel on its cover: "Lehmann's Catalog. Neues Exemplar. Bd. I und II. Im I. 1862 aus der academischen Bibliothek erhalten Ad. Goebel fur mineral Museum" – Lehmann's catalogue. New issue. Vol. 1 and 2 in 1862 was taken from the academician library for the Mineralogical museum by Adolph Gebel (Lehmann, 1766).

1766 indicates the time of compiling the catalogue by J.G. Lehmann and not a precise date of manuscript creation as we are dealing with the inventory list ("new copy"). Scientific literature bears the evidence that J.G. Lehmann made first descriptions according to his own systematics in the 1750s when collections of the Kunstkamera rescues after the fire we stored in the Demodov's mansion. Later, the collections were moved back into renovated building, and on the basis of the Lehmann's Catalogue one made a list with the lost specimens crossed out and the new ones – added (Solskiy, 1961).

<sup>1</sup> – Johann Gottlob Lehmann (1719 – 1767).

When Princess Ekaterina Romanovna Dashkova became the president of the Academy of Science, the Mineral Cabinet was rearranged according to the new systematics by J. Wallerius (Belyaev, 1793). This was the time of creation of the last in the XVIII century Mineral catalogue of the *Kunstkamera*, which was compiled by J.G. Georgi in 1786 – 1789: "Index Lithophylacei Rossici Musei Academiae scientiarum Petropolitanae" and "Index Lithophylacei exotici Musei Academiae scientiarum Petropolitanae" – inventories of Russian and Foreign Mineral Cabinets of the *Kunstkamera*. At the same time, the fossil collection of the Mineral Cabinet of the *Kunstkamera* was described in another catalogue "Enumeratio fossilium Rossiae indigenorum et exoticorum..." (Severgin, 1814).

The above mentioned "Georgi Catalogue", kept in the archive of the Fersman Mineralogical museum RAS (Index..., 1789) – is a list "Index Lithophylacei Rossici Musei Academiae scientiarum Petropolitanae" (Catalogue of Russian minerals of the Imperial academy of Science Museum), marked as a copy of the original Catalogue (Georgi's Katalog der russischen Mineralien und Gesteine (1786 – 1789), Copie des Georgischen Originale – the Georgi Catalogue of Russian minerals and rocks (1786 – 1789). Copt of the Georgi's original). According to the title list, this manuscript can be dated as 1789, however one should consider notes made for the Lehmann's Catalogue, from the Mineralogical museum archive.

It is appropriate to consider the catalogue of the Gottwald's collection – the first large mineral collection, that was acquired by Peter the Great and became the fundament of the Mineral Cabinet (Gmelin, 1954). It is obvious that in order to understand specifics of description of the Mineral catalogue 1745, one should compare it both with the later descriptions by Lehmann and Georgie, and the earlier Catalogue of the Gottwald's Museum.

Here we consider the inventory of the Christoph Gottwald's collection, from the Mineralogical museum (Gottwaldianum museum) Archive. By the courtesy of Natalia Pavlovna Kopaneva, the senior scientist of Department of the *Kunstkamera* history and Russian science of the XVIII century (M.V. Lomonosov Muesum) RAS, who discovered the beginning of this inventory (2 sheets) in the Section of Manuscripts RASL (Musaei Gottwaldiani...), we now have an opportunity to combine two parts of the handwritten manuscript and get the full concept on the mineral collection of Christoph Gottwald. Also author is very grateful to Anna

Sergeevna Smirnova, the scientist of the Institute of linguistics RAS, Department of "M.V. Lomonosov's Dictionary" for decoding and translation of the Latin part of the Gottwald's Catalogue of the Mineralogical museum (Gottwaldianum museum) Archive.

We know nothing about the exact date of the Gottwald's Catalogue from the Fersman Mineralogical museum Archive and RASL, but undoubtedly, this collection was formed far earlier than the Mineral Cabinet of the *Kunstkamera*. Dr. Christoph Gottwald of Danzig (1636 – 1700) founded the collection which his son, Johann Christoph (1670 – 1713) kept and supplemented. The Gottwald's collection was acquired at the auction in Danzig in 1714 (Margócsy, 2010; Reve, 2006) and arrived to the *Kunstkamera* in 1716 (Palaty, 1744).

In the Russian literature the name of the acquired collection for the *Kunstkamera* is stably known as the "Mineral Cabinet of Dr. Gottwald"; however it is clear from the inventory, that the collection of the naturalist from Danzig contained not only minerals and fossils, but botanic, zoological collections and art pieces (Gottwaldianum museum). According to the Gottwald's Museum Catalogue, minerals occupied three display cases; conchological and zoological collections – the forth case; botanic, the smallest one – the fifth case; and art collection (Artificialia) was described separately and contained more than hundred items. Here we will consider only mineralogical part of the Gottwaldianum museum ignoring the other parts.

The question on how adequately this inventory reflects the structure and sense of the Gottwald's collection is still open. Was is an inventory compiled by the son of Christoph Gottwald; or auction inventory that came along with the collection for sale; or it was compiled in the *Kunstkamera* in St.-Petersburg – we do not know. The printed versions of the Catalogue of the Gottwaldianum museum were published several times, every copy referred to the certain part of the collection.

There are at least three different versions of the printed Catalogue of the Gottwaldianum museum, representing various parts of the collection. The latest one – is the Catalogue of the conchological and anatomy collections 1782 (Schröter, 1782) and also Catalogue of the conchological and anatomy collections 1714 (Gottwald, 1714<sub>2</sub>); apparently the earliest is the one that was distributed prior to the auction where the Gottwald's collection was purchased for Peter the Great: "Museum Gottwaldianum, sive catalogus rerum variorum, tam naturalium,

quam artificialium ... collectarum a ... C. Gottwaldio, & J. C. Gottwaldio, quas publica auctione 1714 dividet G. Mattern" (Gottwald, 1714). This very catalogue was referred to by academician V.I. Vernadsky who mentioned that the Gottwald's collection contains mostly minerals collected on the German territory (Vernadsky, 1988). Despite the vagueness mentioned, the handwritten Catalogue of the Gottwald's collection from the Fersman Mineralogical museum RAS Archive remains the important source. Over centuries it is known to the historians of the Mineralogical museum, it was widely referred to (Severgin, 1814; Gebel, Information...; Solskiy, 1861) and used as the work material. The complete correlation of the mineral descriptions in the Gottwald's Catalogue and the Mineral Catalogue of the Kunstkamera and also attribution of existing museum items after the Gottwald's Catalogue was never made, despite several attempts. In particular, in the XIX century the Mineralogical museum keepers Konstantin Grewinkg and Adolph Gebel devoted themselves to the history of the early collections of the Mineralogical museum of the Academy of Science (Gebel, Information...).

In Russian literature, with reference to the handwritten Gottwald's Catalogue from the Mineralogical museum archive, it is often indicated that the number of specimens in the Mineral collection of Dr. Gottwald was "1195 pieces" (Severgin, 1814; Gebel, Information..., Solskiy, 1961). These data is to be considered cautiously. This number was first given by V.M. Severgin (Severgin, 1814); however he noted himself that this list does not comprise "ambers, fossils, droplets and the like". We note, that rough estimate of ambers in the Gottwald's Catalogue gives us the number exceeding three hundred specimens. Along with that, in this catalogue there listed the number of boxes and not specimens (or – also often – specimens in plural, without precise number). The last fact clearly indicates the difficulty of the total estimate of the mineral specimens from Gottwaldianum museum. The same can be said about the Mineral catalogue of the Kunstkamera 1745 (Lomonosov, 1954<sub>1</sub>) where rather often we see the word "specimens" in plural, instead of exact number. That is why one has to consider the number of museum items described in the Mineral Catalogue 1745 (indicating to include approximately 3000 specimens), with care. We certainly can speak about inventory items, but we have to take into account the style of specimens arrangement that was different in every catalogue; this cir-

cumstance can disturb our understanding of the collection growth trends.

We can only affirm that, according to I. Gmelin, who judged about the composition of the Kunstkamera mineral collection not only by descriptions but who was holding the specimens; the Gottwald's collection was the "major" part of the newly established Mineral Cabinet of the Kunstkamera (Gmelin, 1954).

These three catalogues of the Mineral Cabinet of the Kunstkamera (Gmelin-Amman-Lomonosov, Lehmann and Georgi) clearly demonstrate the changes in the principles of description of the mineral collections in the XVIII century.

By the modern museum standards occurrence of the three different catalogues within half a century seems to be excessive (it is more convenient, obviously, to keep one inventory book and add new records to it). However, we should remember that in the XVIII century the catalogues of the Mineral Cabinet of the Kunstkamera were more like the exhibition guidebooks rather than inventories. "The Mineral Cabinet is a collection of all the mineral objects and their combinations, which arranged according to a certain order", indicated J.G. Lehmann (Lehmann, 1774). The specimens in the display cases were arranged according to one or another mineralogical classification, and changes in the system of description always resulted in changes of the collection catalogue (in the XVIII century there were several changes of system). Although every chapter of the catalogue contained blank pages for the further descriptions of the new acquisitions, the catalogue structure itself was getting out of date.

Thus, the catalogues of the Mineral Cabinet of the Kunstkamera shows us three different classification systems. The latest, by Georgi, was compiled according to the systematics by J. Wallerius<sup>2</sup>. This is indicated by the notes within the catalogue, where the list of minerals is arranged by classes of the Wallerius system. The descriptions of the display cases of that time it is emphasized the "wise" new arrangement of minerals by the "Wallerius system" (Belyaev, 1793).

Lehmann arranged minerals according to his own system described in his "Mineralogy" (Lehmann, 1772), although very similar to the system by Wallerius (that was published in 1747, according to Adams, 1990). It is much more complicated to determine the system for the Mineral catalogue of 1745, because it is very tempting to accept an opinion by V.M. Severgin (who is widely believed to be the founder of mineralogy in Russia), that mineral description had no order: "No one knows, however, what System it was fol-

<sup>2</sup> – Johan Gottschalk Wallerius (1709 – 1785) – Swedish chemist and mineralogist.

lowed by, as the mentioned inventory has no Systematic order" (Severgin, 1914).

Some conception of a system, according to which the minerals were arranged in the Mineral catalogue, is given by I.G. Gmelin (apparently, it was him who was responsible to accept this system): "...to begin with, I separated ordinary looking stones from the specified ones. Then I unite them by certain types and, after that, began to write a catalogue of sandy, siliceous, rocky mica-ceous stones, selenites etc. without any order... Thinking of a method – as there is no method that deserves to be named such – I came over the following ideas. All stones with uncertain shape may be combined into three highest classes: formed 1) in the ground, 2) in live creatures, 3) in the water. The first class comprehends fertile and infertile. Some of fertile stones give sulfur, some – salts, others – metals... Infertile stones either melt into glass or transform into lime (Gmelin, 1954, p. 658).

Omitting some details of Gmelin's reasonings, we shall note, however, the researcher's approach in his cataloguing. By the first third of the XVIII century there existed multiple, even fantastic, classifications of minerals, but two major approaches – by Agricola<sup>3</sup> and Gessner<sup>4</sup> – were used more often.

Gessner developed complicated classification of minerals and fossils by their shapes. He defined 15 classes, where minerals were arranged from the simplest forms (class 1, geometric shapes; this class was represented, for instance, by pyrite which occurs as cubic crystals, etc.) to the extremely queer (class 7 – minerals resembling plants or grass, class 9 – looking like animals parts (hair) – as native silver wires etc.) (see Adams, 1990).

According to Agricola, systematics of minerals (or "fossils", by Agricola) should be based, first of all, on their physical properties: colour, weight, transparency, lustre, flavor, shape, structure. All the "fossils" were divided into two large groups: simple (composed of one material) and composite (of several different). The simple "fossils" were subdivided into four more classes: soils (terrae), thickened mineral sap (succus concretus), stones (lapides) and metals (metallum). The composite "fossils" were subdivided into two classes, "mixta" – mixed (those that can be divided only with fire) and "composita" – composite (that can be divided mechanically by hand or dissolved in water). Further, the "thickened mineral sap" were subdivided into more two types – greasy (sulfur, bitumen, orpiment) and

poor and dry (salts, alum); "stones" – into four types: proper stones (magnet, hematite, goethite, belemnites, ammonites), gemstones, marbles (marble, basalt, alabaster etc.) and building stones (limestone, sandstone). An example of the composed "fossils" – galena, siderite, arsenopyrite; of the mixed ones – any aggregates of several minerals, various conglomerates, for instance, the widely spread quartz with native gold.

We do not overview all the aspects of the mineral classification development, re-addressing those who interested to the specialized literature (Adams, 1990; Wilson, 1994; Jameson, 1995), however must note, that the system by Agricola determined the development of mineralogy for a long time, and was repeated in various versions. Kentmann<sup>5</sup> was the first one, who applied Agricola's classification for describing mineralogical collection (Adams, 1990).

In particular, he described his own mineral collection ("Catalogus rerum fossilium Io. Kentmani"), that contained approximately 1600 specimens, in the small essay "Nomenclaturae rerum fossilium quae in Misnia praecipue *et aliis quoque regionibus inveniuntur*" (1565), that was published within one volume together with another papers on mineralogy (including work by Gessner on the mineral classification, mentioned above) (De omni..., 1565). Kentmann's catalogue was the first catalogue of a mineral collection, which was built on the scientific principles (in early works and theses – lapidies, all the minerals were arranged and considered without any scientific system, but alphabetically).

It is evident, from the Gmelin's work on the Mineral catalogue that he was trying to create his own classification, based, first of all, on a genesis. However, obviously, the fundament of his new classification in the Mineral catalogue was the system of Agricola – Kentmann, although slightly changed. At the same time, the importance of mineral shapes in mineral classification was resonant from Gessner's ideas and resulted in the "figure" stones class formation.

The inventory of the mineral collection from the Gottwald's Museum gives a slight idea about the system used for arranging minerals. Nevertheless, even the order the mineral classes were arranged by, is not completely understood now, the minerals were still separated by several groups: metals, salts, ambers, gemstones, fossils and others. It is typical that this order within the drawers of the cabinets is disturbed quite often by intrusion of specimens which did not fit "their

<sup>3</sup> – Georgius Agricola (Latin) – real name (German) Georg Pawer (1494–1555) – German scientist, one of the founders of mineralogy.

<sup>4</sup> – Conrad Gessner (1516–1565) – Swiss naturalist.

<sup>5</sup> – Johannes Kentmann (1518–1574) – German medical doctor and naturalist.

own" place. For example, these are coloured stones (amethyst, marble, jasper, lapis, agates) fit between ambers and disturbed their order (Gottwaldianum museum). However, in the Mineral catalogue by Gmelin-Amman-Lomonosov also contains such cases. Thus, the "Marble paining" contains agates, jasper and onyx, with label "Stones under №80 and 84<sup>6</sup> are located under this № because it was impossible to put them with the same-kind stones due to a tight space in the boxes" (Lomonosov, 1954<sub>1</sub>). It is worthwhile to mention here that modern museums face the same free space problem.

The catalogue by Gottwald might be known to the authors of the Mineral catalogue of 1745, however at present we have no sufficient data to prove so. V.M. Severgin, examining the composition of Gottwald's collection, refers to its inventory as to the "original" one (Severgin, 1814). It is not completely obvious, whether he considers the handwritten Catalogue by Gottwald described in this paper, as there could be some other inventories. The same thing can be said about the nature of mineral description in the Mineral catalogue and Gottwald Catalogue. We already mentioned similarity of description of the Florentine (ruin) marble in these two catalogues (Novgorodova, 2010). However, apparently, here is not the same but the similar description – almost a template. If we consider the descriptions of the widely represented "exotic" stone – Florentine marble in the catalogues of rarities of XVII-XVIII centuries, we shall see that almost everywhere it was mentioned as a stone showing ruined towns and houses, trees, clouds etc. That is why, Lomonosov, who described marbles of the Mineral Cabinet of the Kunstkamera, probably had no need to synchronize with the Gottwald's collection inventory; he might know himself the "standard" description of the Florentine (ruin) marble, from other sources.

On the contrary, another description of a specimen from the Gottwald's Museum, given by Lomonosov in the Mineral Catalogue, is unexplainably detailed comparing to the Gottwald's Catalogue. Gottwald wrote: "...inter calculos humanos eminent Renalis et Bilarii ex corpore Serenissimi Regis Poloniae Joannis III exempti" – "... amongst human stones there are kidney and gall stones extracted from the body excellent king of Poland Ioann III" (Gottwaldianum museum). Lomonosov wrote: "131. Calculus e rene dextro serenissimi regis Poloniae Johannis III post mortem exemptus" – "131. The stone was found in the right kidney of king of Poland Ioann III, post mortally" (Lomonosov, 1954<sub>1</sub>, p. 59). Where did Lomono-

sov find out about the right kidney? Was this stone such a fame that it did not require any information from the Gottwald's Catalogue? Or was there another source? Both catalogues have a lot in common that is not confined by the examples given; it is very interesting but we should better concentrate on the similarity and difference of the description structure in the catalogues reviewed.

In this sense, descriptions of amber in the Gottwald's Catalogue and by Lomonosov are most interesting for us. The first-rate extensive collection of ambers was the major specialty of the collection acquired from Danzig (About amber, 1739). Severgin notes that ambers from the Gottwald's collection were arranged according to the system by Dr. Hartman: "The ambers were probably arranged by colour, by insects and other objects included, by appearance, by kind of mining and by handicrafts made of them, as we can conclude upon D. Hartmann's work" (Severgin, 1814).

In the Gottwald's Catalogue along with this detailed differentiation the separate inventory lists of the amber collection (amber with insects inclusions, rough amber, figure amber) is also mentioned (Gottwaldianum museum, p. 8). The location of these separate inventory is unknown so far. Comparing description of amber in the Gottwald's Catalogue and the Mineral Catalogue, we see, that according to requirements of Hartmann's classification, the specimens which were described extremely fractionally by Gottwald, are aggregated by Lomonosov into two large groups: "Ambers with included insects" (which were of Gottwald's prime interest) and "Parti-coloured ambers" that comprised all the rest, including amber articles (Lomonosov, 1954<sub>1</sub>). It is possible that such a impudent treatment of the "Dr. Hartmann's system" was evoked by a fairly low Lomonosov's opinion on it. Nevertheless, the authors of the Mineral catalogue were not brave enough to renounce these curious principles of classification and build on the new system – within the second large group there is some sort of an order, adopted from Gottwald.

As it was mentioned earlier, it is difficult to reveal certain system in the Gottwald's collection description. However, every catalogue has a beginning – and this beginning is very demonstrative. The description of the Gottwald's collection starts with gold, silver and its ores, followed by lead, copper, tin, mercury, antimony ores etc. we know that Kentmann's scientific descriptions of collections started with "soils" (terrae). This is how the three

<sup>6</sup> – Probably, misprint; should be "under №№ 80 – 84".

Mineral Catalogues: of 1945, Lehmann and Georgi start.

The fact that collector Gottwald paid respect to the amber "Dr. Hartmann's system" and disregarded scientific systematics tells us either about a character of the doctor from Danzig (who began his systematics description with gold), or about predominance of enthusiasm over the up-to-date scientific literature. Nevertheless, as it was mentioned above, we do know exactly who was the author of this inventory. In the XVII–XVIII centuries there were no generally accepted mineralogical classification. In the "First fundamentals of metallurgy" M.V. Lomonosov mentioned that mineral collectors in the systematic descriptions of their cabinets used to place first those minerals abundant in their region: "And where they occur and being produced, only their descriptions <mineral cabinets – comment by the author, DN> differ according to places and descriptors. When mineralogy is written by a Saxon, he mostly has silver and lead ores, Hungarian has gold ores, Englishman – tin, Swede – copper and iron. Moreover, each arrange the minerals collected by his own system and finally thinks that the underground nature chose its capital in his ore cabinet. Both before and nowadays the best mineralogical systems can be only the descriptions of the private mineral collections, arranged by people with vague knowledge in physics and mathematics (Lomonosov, 1954<sub>2</sub>). We would remind that Lomonosov knew Christoph Gottwald's collection well, as was working on the catalogue for the Lunstkamera. On the basis of this quotation we can suppose that he also knew about the Gottwald's Catalogue. It is obvious, that he disregarded the system, presented in the Gottwald's Catalogue. Understanding all the complexity and importance of the task, Lomonosov deliberately started writing his "Mineralogy" only in his late years.

The curious systems of mineral classification at the first third of the XVIII century are going to the past, in scientists try to build a scientific, consistent and comprehensive system for description of the mineral world. The famous "Sistema Naturae" by Linnaeus, published in the 1735 and revolutionized biological sciences, turned out to be inapplicable for mineralogy.

I.G. Gmelin in his translation of the Sistema Naturae by Linnaeus counted more than twenty seven "Systems of Mineralogy" written by various authors in different European countries over 128 years, from 1647 till 1775, the year when the translation was published (Adams, 1990). V.M. Severgin, who contributed like no one else into development of mineralogy in

Russia and who was rather exacting about scientific terms definitions, published several versions of his "Mineralogy" over 33 years period with new mineral classification in almost every issue: by Kirwan (Severgin, 1791), Daubenton (Severgin, 1804), Leonhard and Karsten (Severgin, 1816), Werner (Severgin, 1824). Every time he explained the superiority of a certain systematics over the others.

In the last quarter of the XVIII century the idea about the primary importance of chemical composition in the mineral classification is being established. However, knowledge in chemistry were not developed enough to create chemical classification. J.G. Lehmann regretfully wrote: "It is needed to arrange matter according to the chemical bases, and therefore to study each of them thoroughly, to combine them within one class of the similar objects with the same significant parts and mixtures. It is easy to say so, but difficult to implement; many centuries will pass before the mineral kingdom will be ordered by this manner. And here I doubt that this would reach absolute genuineness as every day new objects are discovered and new mixtures are found" (Lehmann, 1772).

Thus, in the second half of the XVIII century there existed multiple "Systems of Mineralogy". Their majority did not differ much and were mostly based on the principles by Agricola and applied by Kentmann. Classification by Wallerius became popular for a while (published in 1747, Adams, 1990) and, even this was the fundament for one of the mineral catalogues for the Kunstkamera (Index..., 1789), there is no reason to consider it in detail. Wallerius did not contribute anything new to the mineralogical systematics and was using the principles of Agricola-Kentmann, but, rather, more consecutively and accurately. The same can be said about the classification by Lehmann – the author of the Mineral Catalogue of the Kunstkamera of 1766.

The turning point in development of the mineralogical descriptions occurred later, only with accepting ideas of systematics A.G. Werner and R.J. Haüy in the XIX century. However, this topic is another matter of investigation.

Thus, we have to consider the latest Mineral catalogues of the Kunstkamera as the most "complete" – the most scientific, strict, consistent and clear. However we should not forget how soon systems by Lehmann and Wallerius became obsolete. The "scientific" descriptions of minerals do not look appealing and obvious. In fact, everything we see in the catalogues by Lehmann and Georgi is a number of classes representing the "system of mineralogy" with timid

and uninformative filling. The system is obviously primary, and material itself is described rather schematically and indifferently; whereas the first Mineral catalogue of the *Kunstkamera* consists of live descriptions which included authors' doubts, comments and suppositions. The accuracy of a description of the marble Florentine mosaics made by Lomonosov, enabled the author to attribute several items kept in the Fersman Mineralogical museum RAS (see paper by D.D. Novgorodova, p.).

Another remarkable detail: in some cases along with colourful and detailed description of colour, pattern and shape of the marble sample, M.V. Lomonosov gives Italian names of this stone varieties: Rosso e giallo, pomarolo, Brentonico fiorito, rossetto di Franzia, sanguigno, Africano, Brocacello di Spagna, Pavonazo, Amaranto, Recovaro, Brentonico, Rosso Verona (Lomonosov, 19541). The later catalogues of the Mineral Cabinet, by Lehman and Georgi marble descriptions omit these names, all information that remained is colour and surface finish – what an unpleasant discovery for the modern researcher. This concerns not only marble, but also another parts: descriptions became more formal and compact, and absolutely saved from “extravagances” (including, in particular, description of shapes and size).

It is not quite obvious, whether excessive description is harmful for science, however, there is no doubt that for the museum researchers it is priceless. The museum keeper knows that the inventory labels tend to get lost or fade, the specimens in the collections – to mess up, and then – during revision and identification of the “lost” specimens – nothing can be compared with the colourful and detailed description of an item.

Summarizing the comparative investigation of the three catalogues of the Mineral Cabinet of the *Kunstkamera* regarding mineral systematics presented, we can affirm the trend of development of the mineralogical knowledge.

The Mineral catalogue by Gmelin-Amman-Lomonosov (1745) reveals nucleation of the scientific principles – although this work is mostly very close to the “curious” descriptions of minerals (chapters “Various stones grew into one”, “Stones with figures” – Lomonosov, 1954,), but already differs from Gottwald's Catalogue by the well-thought, even imperfect, mineralogical system.

Two consecutive catalogues – by Lehmann (1766) and Georgi (1786–1789) – strikingly differ from the Mineral catalogue (1745) by confidence, accuracy and strictness of ideas on the order in the mineral world. Thus, the catalogues

by Gottwald and Mineral catalogue by Gmelin-Amman-Lomonosov have obviously applied character – they combine detailed description and material for the scientific research simultaneously. Another situation with the catalogues by Lehmann and Georgi, where scientific ideas subordinate the factual material, and inexorable order of the “System of Mineralogy” sets the strict matrix to be filled with specimens in a certain sequence. Actually, it is unsuitably to consider these catalogues as a description of a collection, as the specimens from the Mineral Cabinet are represented there at most laconic and rather serve as a reason to demonstrate “Systems of Mineralogy”.

In general this shows the development of the *Kunstkamera* collection in the XVIII century – from the collection of “curiosities” appearing by the collector's fancy, to the strict scientific collection, arranged according to the up-to-date scientific discoveries. A little later, this process resulted in the final differentiation of sciences and the *Kunstkamera* sprang to various specialized scientific museums. The first Mineral catalogue of the *Kunstkamera*, even with all “flaws”, is the remarkable scientific work, which combines scientific research, courage of discoverers and fascinating description.

This paper on the mineral catalogues of the *Kunstkamera* is to be concluded the same way it began – with words by Walter Benjamin. We observed that the collection of curiosities of the Mineral Cabinet of the *Kunstkamera* transformed quickly into the scientific one. But the scientist in some sense is alike the collector, and museum curators, probably, comprehend weaknesses of both. “Even though public collections may be less objectionable socially and more useful academically than private collections, the objects get their due only in the latter. I do know that time is running out for the type that I am discussing here and have been representing before you a bit *ex officio*. But, as Hegel put it, only when it is dark does the owl of Minerva begin its flight. Only in extinction is the collector comprehended”. (*Walter Benjamin. Unpacking my Library*).

## References

- About amber // Notes to StP Vedomosti. StP.: Imperial Academy of Science. **1739**, 11 May. P. 149 – 164.
- Adams F.D. The birth and development of the geological sciences. New York: Dover Publication. **1990**. 506 p.
- Backmeister I. Experience on the library and cabinet of rarities and Natural History of the Saint-Petersburg Imperial Academy of

- Science, published in French by Johann Backmeister Sublibrarian of the Academy of Science, and translated into Russian language by Vassily Kostygov. StP.: Marine gentry cadet academy printers. **1779**. 191 p.
- Belyaev O.P.* Peter the Great cabinet. StP.: Imperial printers. **1793**. Vol. 1–2. Vol. 1. 170 p. Vol. 2. 158 p.
- De omni rerum fossilivum genere, gemmis, lapidibus, metallis, et hviivsmodi, libri aliquot, plerique nunc primum editi // Kentmann, J. Nomenclaturae rerum fossilium – Kentmann, J. Calculorum qui in corpore ac membris hominum innascuntur genera XII – Fabricius, G. De metallicis rebus ac nominibus observationes variae – Goebel, S. De succino, libri duo – Cordus, v. De halosantho seu spermate ceti liber – Epiphanius, Saint. De XII gemmis quae erant in veste Aaronis, & . – La Rue, F. De gemmis aliquot – Gesner, K. De rerum fossilium, lapidum et gemmarum. Tiguri: excudebat Iacobus Gesnerus. **1565**. (in Latin).
- Gebel A.F.* Information, collected by Gebel on the mineral collections, arrived to the Academy of Science since XVIII century till 1872. Materials for history of the Mineralogical museum. StP branch of the RAS archive. F. 25. Op. 1. № 144. 96 s.
- Gebel A.F.* Catalogues of the Mineralogical museum of the academy of Science, Vol. VIII, iss. 2. StP.: Imperial Academy of Science. **1886**. P. 57–66.
- Gmelin J.G.* A remark, necessary for understanding of the mineral catalogues. 1733. Translated by A.I. Dovatur // Lomonosov M.V. Complete collection works. Vol. 5. Works on mineralogy, metallurgy and mining 1741–1763. Comments to the Mineral catalogue. M., L.: AN SSSR. **1954**. P. 658–660.
- Gottwald C.* Museum Gottwaldianum, sive catalogus rerum variorum, tam naturalium, quam artificialium ... collectarum a ... C. Gottwaldio, & J. C. Gottwaldio. quas publica auctione 1714 dividendet G. Mattern. Dantzig. **1714**. (in Latin).
- Gottwald C.* Museum Gottwaldianum continens tabulas mutas quarum anatomicae sexaginta & una, conchyliologicae quadraginta & novem, aliaeque corpora marina experimentes, sculptae et ad edendum jam paratae. Gedani. **1714**. (in Latin).
- Gottwaldianum museum // Archive of the Fersman Mineralogical museum RAS. D. № 10. 21 s. (in Latin).
- Halls of the St.-Petersburg imperial Academy of Science Library and Kunstkamera with brief description of all the art and natural items, compiled for anyone who is fond of observing those. StP.: Imperial Academy of Science. **1744**. 26 c.
- Index Lithophylacei Rossici Musei Academiae scientiarum Petropolitanae. Georgi's Katalog der russischen Mineralien und Gesteine (1786–1789), Copie des Georgischen Originale // Archive of the Fersman mineralogical museum RAS. 50 s. (in Latin).
- Jameson R.* A brief history of systematic mineralogies // Mineral. Rec. **1995**. Vol. 26. № 4. P. 49–64.
- Kentmann J.* Nomenclaturae rerum fossilium. // De omni rerum fossilivum genere, gemmis, lapidibus, metallis, et hviivsmodi, libri aliquot, plerique nunc primum editi. Tiguri: excudebat Iacobus Gesnerus. **1565**. No pagination. (in Latin).
- Lehmann's Catalog. Neueres Exemplar. Bd. I. II // Archive of the Fersman mineralogical museum RAS. **1766**. D. № 17. 166 s. (in Latin).
- Lehmann J.G.* By Johann Gottlob Lehmann, Royal Prussian mining counselor, Imperial academy of science Chemistry Professor and Member, Mineralogy. Translated by Andrey Nartov, councillor of State, member of Berg college of the Mint department, free Economic society and Leipzig scientist of the free science assembly. StP.: Imperial Academy of Science. **1772**. 143 p.
- Lomonosov M.V.* Mineral Catalogue // Lomonosov M.V. Complete collection works. Vol. 5. Works on mineralogy, metallurgy and mining 1741–1763. M., L.: AN SSSR. **1954**. P. 7–241.
- Lomonosov M.V.* First fundamentals of metallurgy or ore mining // Lomonosov M.V. Complete collection works. Vol. 5. Works on mineralogy, metallurgy and mining 1741–1763. Complete collection works. Vol. 5. M., L.: AN SSSR. **1954**. P. 397–631.
- Margócsy D.* Northwestern University. «Refer to folio and number»: Encyclopedias, the Exchange of Curiosities, and Practices of Identification before Linnaeus // Journal of the History of Ideas. **2010**. Vol. 71. № 1. P. 63–90.
- Musaei Gottwaldiani. Pars prima continens Varia naturalia ex Triplici Naturo Regno polita // RAS Library. Department of manuscripts. F 188. L. 19–20 ob. (in Latin).
- Musei Imperialis Petropolitani qua continentur res naturalis ex regno minerali. Catalogus minerarum. StP: Typis Academiae scientiarum Petropolitanae, 1741–1745. Vol. 1. Ps. 3. **1745**. 227 p. (in Latin).

- Novgorodova D.D.* Florentine mosaics from the "Mineral Catalogue" in the collection of the Fersman Mineralogical museum RAS // Dictionary of M.V. Lomonosov language / edited by acad. N.N. Kazanskiy. Materials for the dictionary. Vol. 5. Dictionary manual "Mineralogy of M.V. Lomonosov" / edited by S.S. Volkov. — StP.: Nestor-Istoriya. **2010**. P. 131–164.
- Reve J.J. van het.* De Kunstkamera van Peter de Grote. De Hollandse inbreng, gereconstrueerd uit brieven van Albert Seba en Johann Daniel Schumacher uit de jaren 1711–1752. Dissertation. **2006**. 350 p. (in Dutch).
- Schröter J.S.* Musei Gottwaldiani testaceorum, stellarum marinarum et coralliorum. Nuremberg. **1782**. 64 p. (in Latin).
- Severgin V.M.* Elementary fundamentals of natural history, containing kingdoms of animals, plants and minerals. Kingdom of minerals. StP.: Imperial Academy of Science. **1791**. Book I. 362 p. Book II. 333 p.
- Severgin V.M.* Brief description in mineralogy, compiled for provincial gymnasia by academician, collegiate councillor Vassilij Severgin. StP.: Imperial Academy of Science. **1804**. 134 p.
- Severgin V.M.* A review of the Mineral Cabinet of the Imperial Academy of Science // Technology magazine. StP.: Imperial Academy of Science. **1814**. Vol. 11. Ch. 1. P. 3–115.
- Severgin V.M.* New system of minerals, based on the external features: wrote by academician, collegiate councillor Vassilij Severgin StP.: Imperial Academy of Science. **1816**. 300 p.
- Severgin V.M.* Brief description in mineralogy, compiled for provincial gymnasia by academician, collegiate councillor Vassilij Severgin. StP.: Imperial Academy of Science. **1824**. 239 p.
- Solskiy D.I.* Essay on a history of the Mineralogical museum of the USSR Academy of Science (pre-revolution period) // Proceedings of the Mineralogical museum. M.: An SSSR. **1961**. Vol. 11. P. 220–230.
- Vernadsky V.I.* Essays on the natural history in Russia in the XVIII century. // V.I. Vernadsky. Proceedings on the history of science. M.: Nauka. **1988**. P.63–202.
- Wilson W.* The history of mineral collecting 1530–1799 // Mineral. Rec. 1994. Vol. 25. № 6. **1994**. 264 p.