

Alexander Smirnov

Meteorite "Sarepta"

The story on Earth

Volgograd

2023

"Meteorite "Sarepta". The story on Earth" / Smirnov A. – Volgograd: "New colors", 2023. – 64 pp.

A 13,352-kilogram meteorite was found in 1854 on the territory of the Sarepta colony in the Saratov province, and was named after it, "Sarepta". The book describes its further path: study, publications, distribution to scientific centers and collections in Russia, Europe, America and other countries. All known collections containing fragments of "Sarepta" with a history of acquisition are given – a total amount of 49 fragments in 29 collections.

Photo of the author (2022-2023), illustrations are from open sources.

On the 1st and 4th covers: photos of the steppe of the supposed area of the discovery of "Sarepta", from a height of 86.0, which is located between the villages Dubovy Ovrage and Privolzhsky in the Volgograd region.

ISBN 978-5-6044325-8-7

© Smirnov A., 2023

Introduction

"Not a single mineral from Earth, not a single object of living matter is studied, perhaps, with such care and is not mystified so willingly, with what they investigate every cosmic substance that has fallen on our planet"

Anastasia Askochenskaya

Meteorites, being messengers from outer space, are very attractive for their history. I asked at the “Biblio-Globus” bookstore if there are any books about meteorites. The consultant asked why there was such an interest in them? I replied that the "oldest" stone on Earth is three billion years old, and meteorites are 4,5. "Then everything is clear." To be more precise, in the German edition “Modern Astronomy, Completely Revised”, published in Munich in 1992, Hans Störig states, the age of the oldest stone was determined by measuring the radioactive splitting of uranium-238 isotopes as 3.9 billion years.

Starting from the school curriculum, all conversations about celestial bodies always arouse genuine interest. It seems to me that interest in the vague forecasts of various astrologers is also involved. But among all this mysticism, there are also quite real bodies that have flown to us from outer space, called meteorites. They are different in composition: stone, iron-stone, iron, as well as planetary. There are not so many of them – according to the International Society for Meteoritics, 153 meteorites and 19 craters were found in Russia over the past 250 years.

S. Kolisnichenko's book "Meteorites of Russia" published in 2019 contains information about "177 events, finds and falls of meteorites collected on the territory of Russia, starting from the middle of the XVIII century and up to 2018 inclusive."

I visited the Fersman Mineralogical Museum in Moscow. It is located next to the Neskuchny Garden in a rather old but spacious



building. When you go up the stairs with high steps, you think about the age of this building. As you go into the museum, you get into a small dressing room: on the right there is a wardrobe, on the left in the corner you see a tempting shop of various minerals. The view of the hall is impressive, more than 20 expositions are placed on an area of 1200 square meters. And it all starts with an exhibition of meteorites. There are huge fragments of “Sikhote-Alin”, and smaller ones, including the “Tsarev”. I stopped by a piece of “Sarepta”. It is made as a slice, and its surface is absolutely shiny, metallic. Another thing is surprising – there are no traces of oxides on this surface.



Photo dated December 2022; March 2023



For explanations about the meteorite "Sarepta", I turned to the museum staff, and I was immediately sent to the seller of a wonderful shop, **Andrei Zakharov**. He was very attentive to my question. I learned from him that the collection of meteorites does not belong to the museum, and they do not even have a description of them. The owner is the Comitee on Meteorites of the Russian Academy of Sciences. Andrey Zakharov leafed through various websites in front of me to find out something new about Sarepta, but only repeated the information I already knew: there is a fragment in the Fersman Mineralogical Museum, and the main part of the meteorite is in Berlin. Fragments of meteorites were exchanged between museums of different countries. He was surprised himself, how did this meteorite end up in Berlin? Here I already acted as a guide, telling about the German colony Sarepta in the Lower Volga region, which carried out missionary activities in Kalmykia during the XVIII-XIX centuries. The colony was subordinate to its Directory in Herrnhut in Saxony. It is not surprising to me that the most valuable, including the various collections from Sarepta, turned out to be in Germany.

This was the beginning of my interest in the “Sarepta” meteorite. I turned to the chairman of the Volgograd branch of the Russian Geographical Society **Sergey Monikov**.

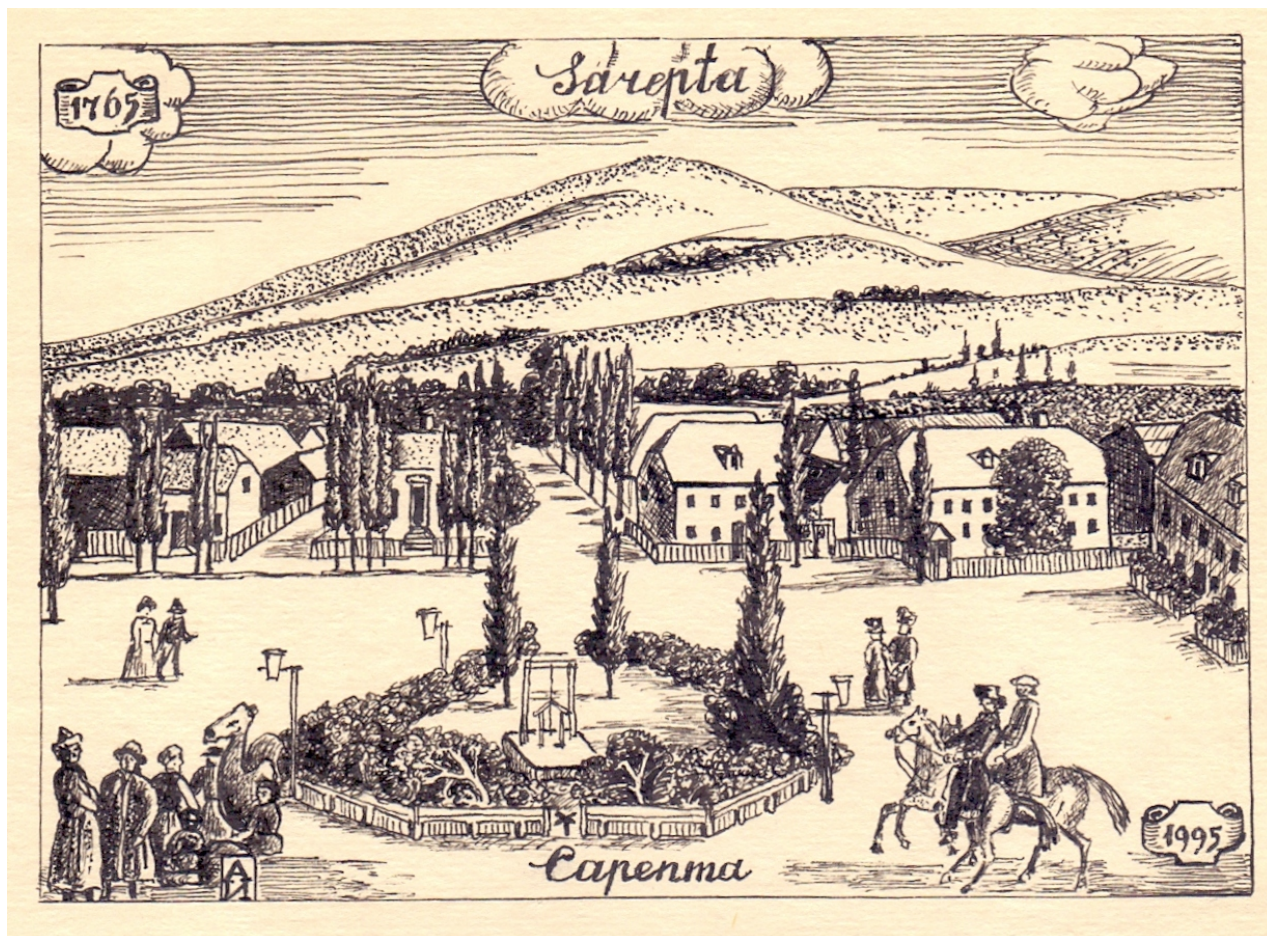


Fig. A.Ilyin. Sarepta Colony

He sent me a quote from which my research began, from the collection of F. R. Sperk "Experiments of the chronological index of literature of the Astrakhan region from 1473 to 1887 inclusive."



Nikolai Barbot de Marni

In 1862 the Russian mining engineer, Professor **Nikolai Barbot de Marni** reported:

"In one place of the lowland steppe, between Sarepta and Tundutova, a meteorite stone weighing 32 pounds and 58 gold pieces was found in 1854. The stone was a rounded flat mass containing no olivine, but very rich in nickel. I saw this meteorite in the collection of K. I. Glitsch in Sarepta."

The weight of the meteorite in the usual measures was 13,352 kg.

A researcher at the Volgograd Museum "Old Sarepta" **Viktor Medvedev** told me about the life path of the discoverer of the meteorite "Sarepta".



*Konstantin Glitsch
(1820-1883)*

Konstantin Theodor Glitsch was born in 1820 in the family of a mustard manufacturer Johann Glitsch. His grandfather Johann Konrad Neitz founded mustard production in Sarepta. Konstantin was educated at the University Dorpat, graduating from the Faculty of Medicine. After graduation, he lived and worked in Berlin for several years. In 1849 he returned to Sarepta and together with his brother began to manage the mustard production. Konstantin was a creative person, collecting objects of ethnography and archeology. In 1853 he independently excavated a mound in the steppe near the Donskaya Tsaritsa River. In 1854 an iron meteorite was

found in the steppe, which Konstantin Glitsch showed to many researchers who visited Sarepta. He sent the materials of his collection to the Herrnhut in Saxony to the ethnographic museum. In 1865 Konstantin Glitsch went to live in Germany, died in 1883.



*Johann Auerbach
(1815-1867)*

Johann Auerbach was a geologist, the son of an apothecary, was born 1815 in Moscow, graduated from the course with a doctorate degree at the University Berlin. He have traveled a significant part of Russia, the Urals, Finland. In 1851 he was elected secretary of the Moscow Society of Naturalists. In 1854 J. Auerbach was sent by the Russian Geographical Society to explore Mount Bogdo in the Caspian Steppe. Then he met K. Glitsch's collection in Sarepta. In the book from the series "Scientific Heritage" (vol. 9, 1984) "K. M. Baer's Caspian expedition in 1853-1857" there is a description of a visit to Sarepta by Karl Baer in 1854. On July 24 Baer left

Sarepta with an expedition, and the next day J. Auerbach arrived there, which was recorded in the letter of K. Glitsch to K. Baer from August 2 1854 given in this book. Thus, the date of Auerbach's arrival in Sarepta can be considered fixed as July 25 1854. There is no mention of meteorites in the diaries of Karl Baer in this book.

J. Auerbach was for many years the curator of the mineralogical collections of the Moscow University and the Rumyantsev Public Museum, and since 1865 - the Petrovskaya Academy of Agricultural and Forestry. He died in 1867 in Moscow.



Sources: reference books, articles

The “Bulletin of the Moscow Society of Naturalists” is posted on the website of the Russian Geographical Society. The collection for 1854 contains 1084 pages, the information we are interested in was found on the 1078th page. This is the first notification about the Sarepta meteorite.

"Bulletin of the Moscow Society of Naturalists". Biological Department. Moscow University Press. It was founded in 1829. Published 6 times a year.



Library of the Moscow Society of Naturalists

OBSERVATIONS MÉTÉOROLOGIQUES

FAITES
À MOSCOU,
PENDANT LES MOIS
..
SEPTEMBRE, OCTOBRE, NOVEMBRE ET DÉCEMBRE 1854,
ET COMMUNIQUÉES
par M. SPASSKY.

N° 4. 1854.

32

Le Second Secrétaire, Mr. le Dr. Auerbach, présente de la part de Mr. Glitsch de Sarépta une masse de fer météorique pesant 32 livres et 58 zolotniks trouvé dans le courant de cette année dans les steppes des Calmouques sur le bord droit du Volga à 30 verstes de Sarépta. — Mr. Glitsch a chargé Mr. Auerbach de faire mouler en plâtre cette pièce unique et d'en couper plusieurs échantillons pour les distribuer à quelques Sociétés savantes, entre autres à la nôtre et à l'Académie des sciences de St.-Pétersbourg. — Ce fer météorique présente une masse compacte arrondie sur les angles sans aucune trace d'Olevine ou d'autre corps étranger; — il est assez riche en Nickel et si on le traite avec de l'acide nitrique il présente sur la surface un réseau de lignes se croisant régulièrement et connu sous le nom de figures *Widmanstedten*, ce qui prouve l'origine météorique de ce fer.

[Translated from French:] The second secretary, Dr. Auerbach, was shown at present by Mr. Glitsch in Sarepta a meteorite weighing 32 pounds and 58 spools, found this year in the steppes of Kalmykia on the right bank of the Volga, 30 versts from Sarepta. Mr. Glitsch asked Auerbach to sculpt this unique piece of plaster, as well as cut out several samples to distribute them to several scientific societies, including our Academy of Sciences in St. Petersburg. This iron meteorite is a compact mass with rounded corners without any traces of olefins or other foreign bodies. It is quite rich in nickel, and if its surface is treated with nitric acid, it is dotted with a network of intersecting lines known as Widmannstaetten figures, which proves that this meteorite is classified as iron.

The second significant publication was the article by **W. Haidinger "Das Meteoreisen von Sarepta"** ("The meteoric iron from Sarepta"), published in the collection "Meetings of the Royal Academy of Sciences in Vienna" (21st meeting on July 24, 1862).

Das Meteoreisen von Sarepta.

Von dem w. M. W. Haidinger.


This article describes the first distribution of fragments of the meteorite "Sarepta". After J. Auerbach made a plaster copy of the meteorite, the meteorite itself was sawn into three parts. The first report of the discovery was made on November 18, 1854 at a meeting of the Moscow Society of Naturalists. The weight of the meteorite was 32 pounds 58 spools (or 25 pounds 18 lots of the Vienna system of calculations), which amounted to 14 kg 325 g (*the weight was calculated incorrectly in the Vienna system, there should be 23 pounds 37 lots - A. S.*). The meteorite is described as a rounded body, without extraneous inclusions, without traces of olivine, rich in nickel. Being treated with acid, it was permeated with the so-called Widmanstaetten lines, which confirmed its origin as a meteorite. Director Hörnes made the right decision to go to Konstantin Glitsch in Sarepta to personally receive a fragment of a meteorite for the mineralogical cabinet of the Royal Academy of Sciences. He made sure that the bulk is divided into 3 large parts. The first, about 8 pounds, was intended for transfer to museums and individuals in Russia free of charge. The second, about 10 pounds, was sent to Herrnhut to the mineral merchant Möschler at a price of 15 Prussian thalers. This part was most likely sold out in small fragments. K. Glitsch had another part. Very prudently, he sent it to Vienna, dividing it into two parts: a large one for the mineralogical cabinet of the Academy of Sciences, a smaller one for analysis and subsequent return. The total weight of this part was 8 pounds, 2 pounds of weight was lost during the division.

Nr. 1	1 Pfd.	6	Wien. Loth	665·012	Grammen.
" 2	1 "	6 ¹ / ₄	" "	669·387	"
" 3		10 ¹ / ₈	" "	177·187	"
" 4		17 ¹ / ₂	" "	306·254	"
" 5		25 ¹ / ₂	" "	446·257	"
" 6		20 ¹ / ₂	" "	358·757	"
" 7		23 ¹ / ₂	" "	393·750	"
Ein Stückchen		1 ³ / ₈	" "	24·062	" wurde

an Herrn R. P. Greg gesandt.

Von diesen wurden die Stücke Nr. 1, 2 und 3 bereits wieder an Herrn Glitsch abgesandt, die Stücke Nr. 4 — 7 liegen mir heute noch vor, und es sind die beiden Nr. 5 und Nr. 6 zur Einreihung in das k. k. Hof-Mineralien cabinet bestimmt.

Table A. The third part of the meteorite

N ^o	Weight, vienn.p.l.	Weight, gr.	Where is it directed	
1	1 6	665,012	K. Glitsch, Sarepta	
2	1 6 ¹ / ₄	669,387	K. Glitsch, Sarepta	
3	10 ¹ / ₈	177,187	K. Glitsch, Sarepta	
4	17 ¹ / ₂	306,254	W. Heidinger, Vienna	
5	25 ¹ / ₂	446,257	W. Heidinger, Vienna	
6	20 ¹ / ₂	358,757	Vienna, Royal Museum	
7	23 ¹ / ₂	393,750	Vienna, Royal Museum	
8	1 ³ / ₈	24,062	R. P. Greg, Manchester	
Total		3040,666		

Es enthalten nämlich nebst der Angabe, dass Herr Glitsch noch die Hauptmasse besitzt, die Sammlungen

	Grammen, Sarepta-Eisen.
in Moskau, des Herrn Dr. Auerbach (2 Stücke)	600
" " der Universität	fast 500
" Würzburg der Universität	716
" London des britischen Museums	360
" " " Herrn Neville	35
" Bonn des Herrn Dr. Krantz	250
" Manchester des Herrn R. P. Greg	82
" Prag des Herrn K. A. Neumann	1·57
" Wien, des Freiherrn von Reichenbach, ohne Gewichtsangabe.	

Die Angaben von St. Petersburg und von Berlin ¹⁾ fehlen.

¹⁾ Seitdem am 7. August von Herrn Prof. Gustav Rose in der Gesamtsitzung der königlichen Akademie der Wissenschaften zu Berlin mitgetheilt. (Siehe Monatsbericht. Hauptstück 4 Pfd. 2·07 Lth. Alle Stücke 4 Pfd. 4·77 Lth. oder (für 1 Pfd. = 30 Lth. = ¹/₃ Kilogramm) 2 K. 31·333 Grm. und 2 K. 79·500 Grm.

K. Glitsch distributed the bulk of the collections:

Table B. The first part of the meteorite

<i>Nº</i>	<i>Whom</i>	<i>Weight, g</i>
1	Moscow, Auerbach (2 fragments)	600
2	Moscow, University	alm. 500
3	Würzburg, University	716
4	London, British Museum	360
5	London, Neville	35
6	Bonn, Dr. Krantz	250
7	Manchester, R. P. Greg	82
8	Prague, K. A. Neumann	1,57
9	Vienna, Baron von Reichenbach	Unknown weight
	<i>Total</i>	<i>2,544+1 fragm.</i>

"This list does not include St. Petersburg and Berlin, although on August 7 at a meeting of the Royal Academy of Sciences Prof. Gustav Rose reported that the main fragment is 4l. 2.07 l. (2.031333 kg) for Berlin. All other fragments are 4 f. 4,77 l. (2,0795 kg)". The article describes in detail how this part of the meteorite was divided and prepared for research, while a lot of waste was lost.

To find out who the "mineral trader" Möshler from the Herrnhut is, I went to the museum "Old Sarepta" to Viktor Medvedev. He said that he knew the entomologist **Heinrich Benno Möschler**, who was also known as a merchant and public figure. Unfortunately, in his biography published in 1994, there is not a word about his involvement in the meteorite trade.

I turned to the specialists on the website of the **Völkerkundemuseum Herrnhut** with the question, do they have fragments of our meteorite, maybe from K. Glitsch or the merchant H. Möshler? The answer was sent by the curator of the museum, **Dr. Frank Usbeck**: "Unfortunately, there is no mention of this meteorite in our museum. The Museum of Local Lore in Herrnhut, which deals with the history of the city, also has no documents on this matter. Mr. Fischer, who runs the Museum of Local Lore and conducts tours of the historical city for Herrnhut, also does not know anything about this."

Thus, we conclude: there are no fragments of "Sarepta" in Herrnhut.



Wilhelm von Haidinger
(1795-1871)

Austrian scientist **Wilhelm Karl Ritter von Haidinger** was born in 1795. His grandfather was a mathematician and astronomer, and his father was a mineralogist Karl Haidinger. In 1840 Wilhelm Haidinger was appointed mining adviser, in 1849 – director of the Royal Geological Department created on his initiative. He created the Royal Academy of Sciences, the Austrian Geographical Society. Haidinger died in 1871 in Vienna.

After studying the article by W. von Haidinger we know: meteorite “Sarepta” was found in 1854 on the right bank of the Volga in the Kalmyk steppes 30 versts from Sarepta.

The weight of the meteorite was 13,352 kg. It belongs to iron meteorites, consists of 96% iron, 2.7% nickel and 1.3% schreibersite (for reference: schreibersite is a mineral found in iron meteorites, consists of iron, nickel and cobalt phosphide). The meteorite was first divided into 3 parts. One was intended for Russia, the second for sale in Herrnhut, the third for scientific research in various European centers. In general, "Sarepta" was divided into many fragments, which it is not possible to count. The fragments of the meteorite named by W. Haidinger got into different collections at the request of Konstantin Glitsch: **Berlin, Royal Academy of Sciences** (2,031 kg); **K. Glitsch** (665,0; 669,4; 177,2 g); **W. Haidinger** (306,3; 446,3 g); **Vienna, Museum** (358,75; 393,75 g); **J. Auerbach, Moscow** (2x = 600 g); **Moscow, University** (500 g); **Würzburg, University** (716 g); **London, British Museum** (360 g); **London, Neville** (35 g); **Bonn, Dr. Krantz** (250 g); **Manchester, Greg R. F.** (82; 24.1 d); **Prague, Neuman K. A.** (1.57 g); **Vienna, Baron von Reichenbach** (weight not specified).

DIE
METEORITEN IN SAMMLUNGEN
UND IHRE LITERATUR
NEBST
EINEM VERSUCH DEN TAUSCHWERT DER METEORITEN
ZU BESTIMMEN
VON
Dr. E. A. WÜLFING
A.O. PROFESSOR AN DER UNIVERSITÄT TÜBINGEN

In the thorough book of professor at the University of Tübingen Dr. **Ernest Anton Wülfing** "Meteorites in collections and their literature" (Die Meteoriten in Sammlungen und ihre Literatur. Nebst einem Versuch den Tauschwert der Meteoriten zu bestimmen von Dr. E. A. Wülfing, a. o. Professor an der Universität Tübingen) with the subtitle "An attempt to estimate meteorites", published in 1897, the owners of the fragments of "Sarepta" as of the end of the XIX century are listed.

Nachweisbares Gewicht: 6544 gr.

Bailey	5	Dresden, M.	90	Minneapolis	2	Stockholm	80
Bement	8	Erlangen	104	Moskau	72	Stuttgart	632
Berlin, U.	1962	Göttingen	20	Neumann	4	Tübingen	247
Bonn	3	Gregory	27	Paris, M.	329	Utrecht	11
v. Braun	23	Harvard, U.	446	Petersburg, A.	252	Washington, Sh.	3
Budapest	254	Klausenburg	2	Petersburg, B.	44	Wien, H. M.*)	751
Calcutta	177	London, B. M.	296	Pohl	120	Würzburg	488
Cleveland	4	London, P. G.	36	v. Siemaschko	7		
Dorpat	41	Melion	4				

Fragments: Berlin, University (1962); Budapest (254); Calcutta (177); Dresden, Museum (90); Erlangen, [University of Nuremberg] (104); Harvard University (446); London, British Museum (296); London, F. G. (36 g); Moscow (72 g); Paris, Museum (329 g); St. Petersburg, [Academy of Sciences] (252 g); St. Petersburg, [Mining Institute] (44 g); Dr. Pohl, Vienna (120 g); Stockholm (80 d); Stuttgart (632 g); Tübingen (247 g); Vienna, Hist. Museum (751 g); Würzburg (488 g), Dorpat (41), Gregory (27 g); von Braun (23 g); Göttingen (20 g); Utrecht (11 g); Biment (8 g); von Simashko (7 g); Bailey (5 g); Cleveland (4 g); Dr. Melion (4 g); Neuman (4 g); Washington, Sheppard (3 g); Bonn (3 g); Minneapolis (2 g); Klausenburg (2 g).

Total 33 owners, 6544 g.

42. d. Oktaëdrische Eisen mit groben Lamellen (Lamellenbreite 1.5—2 mm),
Og. G = 14 535.060 Kgr. (2000—∞).

	U	N	B	W		U	N	B	W
Bemdego	5870	5354.592	40	1	Lexington Co.	4.75	5.053	16	17
Bischtübe	48.75	26.609	13	8	Lonakoning	—	1.134	6	32
Black Moun-					Magura	—	138.387	87	4
tain	0.596	0.384	15	38	Saint François				
Bohumilitz	57	46.856	35	6	County	—	2.418	13	17
Cañon Diablo	—	4121.734	52	1	Sarepta	13.352	6.544	33	11

U – total weight of the meteorite (Ursprüngliches Gewicht); N – confirmed weight (Nachweisbares Gewicht); B – number of owners (der Zahl der Besitzer); W – exchange value (Tauschwert).

“Handbook of Iron Meteorites” (Vagn F. Buchwald), published in 1975 by the California University for the Meteorite Research Center of the Arizona University, contained the subtitle: "Their history, distribution, composition and structure". This book is also generally recognized. It is a three-volume book containing 1426 pages, 2124 illustrations, 8 appendices. Among those described there is also a meteorite "Sarepta". The reference book describes fragments of "Sarepta" stored in various collections as of the mid-1970s: "Sarepta", Stalingrad region, Russia. Approximately 48020'N, 450E; 50 m. (According to the coordinates, this is a place in the Astrakhan region, Chernoyarsky district, east of X. Diligence is about 20 km).

HANDBOOK OF IRON METEORITES

*Their History, Distribution, Composition
and Structure*

by

Vagn F. Buchwald

Department of Metallurgy, Technical University, Lyngby, Denmark

Sarepta, Stalingrad Oblast, Russia

Approximately 48°20'N, 45°E; 50 m

Coarse octahedrite, Og. Bandwidth 2.2±0.5 mm. Neumann bands.
HV 185±10.

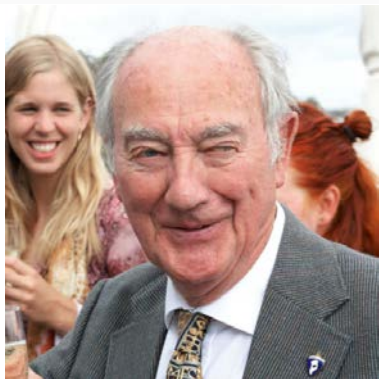
Group I. 6.82% Ni, 0.43% Co, 0.17% P, 100 ppm Ga, 457 ppm Ge,
3.4 ppm Ir.

COLLECTIONS

Berlin (1.96 kg), Paris (973 g), Vienna (751 g), Moscow (739 g), Stuttgart (632 g), Würzburg (488 g), Harvard (446 g), Chicago (286 g), London (283 g), Washington (253 g), Tübingen (336 g), Amherst (203 g), Strasbourg (119 g), New York (95 g), Dresden (89 g), Stockholm (80 g), Budapest (77 g), Calcutta (60 g), Bonn (47 g), Dorpat (41 g), Leningrad (21 g), Göttingen (20 g).

COLLECTIONS: **Berlin** (1.96 kg), **Paris** (973 g), **Vienna** (751 g), **Moscow** (739 g), **Stuttgart** (632 g), **Würzburg** (488 g), **Harvard** (446 g), **Chicago** (286 g), **London** (283 g), **Washington** (253 g), **Tübingen** (336 g), **Amherst** (203 g), **Strasbourg** (119 g), **New York** (95 g), **Dresden** (89 g), **Stockholm** (80 g), **Budapest** (77 g), **Calcutta** (60 g), **Bonn** (47 g), **Dorpat** (41 g), **Leningrad** (21 g), **Göttingen** (20 g).

Total: 22 cities, 7 kg, 26 g. Coarse octahedrite, thickness 2.2+/-0.5 mm. Neuman Group, HV 185+-10. Group I. 6,82% Ni; 0,43% Co; 0,17% P; 100 x10⁻⁶ Ga; 457 x10⁻⁶ Ge; 3,4 x10⁻⁶ Ir.



Vagn F. Buchwald

Professor **Vagn Fabritius Buchwald** (born 1929) is a Danish scientist who created the Handbook of Iron Meteorites in 1975. In 1981-1982 he was President of the International Society for Meteoritics. After a visit to Germany to study meteorites in museums, he concluded that after the war, almost everywhere things are bad with labels on meteorites.

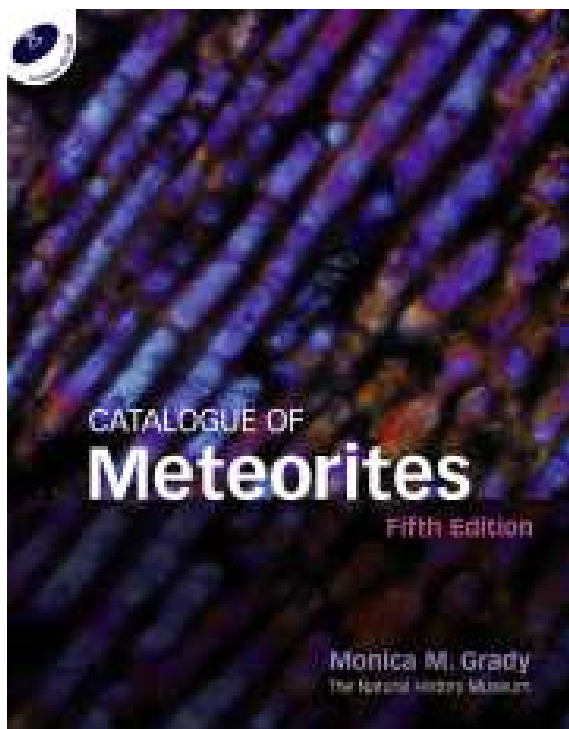
Published in 2000 in London, the 5th edition of the reference book (with CD-ROM) "**Meteorite Catalog**" by **Monica M. Grady**, became one of the last editions listing the distribution of fragments of "Sarepta" in collections around the world.

"Sarepta". 48°29' N, 44°49' E

Volgograd region, Russia. Found in 1854. Iron (IAB), coarse octahedrite, thickness 2.2 mm. Synonym – Saratov. Approximate weight 14 kg.

A piece of about 14 kg was found on the right bank of the Volga, about 20 miles from Sarepta, J. Auerbach (1854). Description by V. von Heidegger (1864). Chemical analysis 6,94% Ni, M. Dyakonova (1958). Late analysis, 6,55% Ni, 99,9*10⁻⁶ Ga,

457×10^{-6} Ge, $3,4 \times 10^{-6}$ Ir, J. T. Wasson (1970). Description: before atmospheric cracking, V. Buchwald (1975). Chemical. analyses, classification and originals – B. J. Choi et al. (1995).



Sarepta

48°29' N. 44°49' E

Volgograd Province, Russia

Find 1854

Iron. (IAB) Coarse octahedrite; bandwidth 2.2mm

Synonym(s): Saratov

Approx. recovered weight. 14 kg

A mass of about 14kg was found on the right bank of the Volga, 20 miles from Sarepta, J. Auerbach (1854).

Description. W. von Haidinger (1864). Analysis, 6.94% Ni, M.I. D'yakonova (1958). Further analysis, 6.55% Ni, 99.9 ppm Ga, 457 ppm Ge, 3.4 ppm Ir, J.T. Wasson (1970). Description: pre-atmospheric fissuring, V.F. Buchwald (1975). Analysis, classification and origin, B.-G. Choi *et al.* (1995).

Distribution: 2kg, MfN, Berlin, main mass; 1.25kg, Acad. Sci., Moscow; 1kg, MHN, Paris; 750g, NHM, Vienna; 427g, Harvard Univ.; 339g, Univ., Tübingen; 275g, FMNH, Chicago; 217g, USNM, Washington; 207g, ASU, Tempe; 12.5g, Vatican Colln, Rome; 6g, MPI, Mainz; 94g, AMNH, New York; 16g, DuPont Colln, Palatine, Illinois; 0.8g, Mainz, Paneth Colln; 60g, GSI, Calcutta.

Speciment(s): [33750], 223g; [36605(3)], 60.5g; [1985.M.294], 36g.

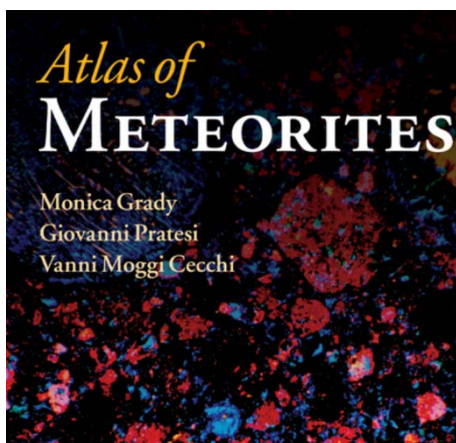
Description: 2 kg – **Berlin, Museum of Natural History**, main mass; 1.25 kg – **Academy of Sciences, Moscow**; 1 kg – **Museum of Natural History, Paris**; 750 g – **Vienna, Museum of Natural History**; 427 g – **Harvard University**; 339 g – **University of Tübingen**; 275 g – **Field Museum of Natural History, Chicago**; 217 g – **Smithsonian Museum of Natural History, Washington**; 207 g – **Arizona State University, Tempe**; 12.5 g – **Vatican, Collection**; 6 g – **Max Planck Institute, Mainz**; 94 g – **American Museum of Natural History, New York**; 16 g – **Dupont Collection, Palatine, Illinois** [Chicago suburbs]; 0.8 g – private collection of **F. Paneth, Mainz**; 60 – **National Museum of India, Calcutta**. Fragments [in the **London Museum of Natural History**]: [33750] 223 g; [36605(3)] 60.5 g; [1985.M.294] 36 g.

Coordinates 48029' N, 44049' E show a point on the Volga near the Svetly Yar district center.



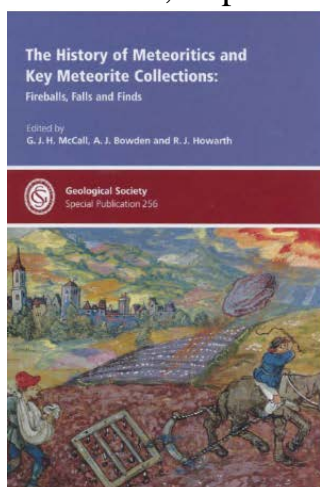
Monica M. Grady

Monica Mary Grady was born in 1958. She worked at the London Museum of Natural History as a curator of the national collection of meteorites of Great Britain. She has published numerous papers on the geochemistry of carbon and nitrogen isotopes in meteorites. Since 2000 she has been a member of the International Society for Meteoritics, of which she was president in 2012-2013.



In 2014, the University of Cambridge Press published the Atlas of Meteorites, the authors are **Monica Grady, Giovanni Pratesi, Vanni Moggi Cecchi**. This real encyclopedia of meteoritics presents a complete classification of meteorites in combination with a description of all their important classification parameters. The book contains excellent photos that can be seen on the website <http://www.cambridge.org/9780521840354>.

In 2006, an amazing book of 520 pages, prepared by the Geological Society of London, "The History of Meteoritics and key meteorite collections: bolides, falls and Finds" was published. The authors are Joe McCall, Alan Bowden and Richard Haworth. The idea of the book arose in December 2003 after a meeting between Joe McCall and Peter Tandy with the group on the history of geology of the London Geological Society, when the history of meteoritics up to 1920 was covered. Then a plan of 24 articles was agreed. These articles relate to the early development of meteoritics as a science; collecting and museum collections; research establishing the origin of meteorites; impact craters and tektites.



GEOLOGICAL SOCIETY, LONDON, SPECIAL PUBLICATIONS

The History of Meteoritics and Key Meteorite Collections: Fireballs, Falls and Finds

Author(s): G.J.H. McCall; A.J. Bowden; R.J. Howarth

Geological Society of London
Volume 256

DOI: <https://doi.org/10.1144/GSL.SP.20060101>

ISBN electronic: 9781862395046

ISBN print: 9781862391949

Publication date: January 01, 2006



The
Geological
Society

Gerald Joseph Home McCall (1920-2013), or **Dr. Joe McCall**. During the 2nd World War, he fought as part of the British troops in Africa. After the war, he graduated from college with a degree in cartography and worked in the Geological Survey of Kenya. In the 1960s he taught at the University of Western Australia. Later he worked in Kenya, Australia, Canada, England in industry. Author of more than 20 books. In 1968 he was awarded the degree of Doctor of Sciences by the University of London, in 1994 he received the Cox Medal of the London Geological Society, in 1997 – the award for outstanding services of the International Geological Society.

Alan James Bowden is the curator of Physical and Earth Sciences at the National Museum of Liverpool.

Richard J. Howarth is a professor at the University College in London, Faculty of Earth Sciences.

There is information about “Sarepta” on the website of the **International Society for Meteoritics and Planetary Science** <https://www.lpi.usra.edu/meteor/>. A meteorite mass of 14 kg has been announced, the place of discovery is Russia.



In the catalog published in 2000, "Sarepta" is listed as one of 119 described iron meteorites.

Sarepta	
Basic information	Name: Sarepta This is an OFFICIAL meteorite name. Observed Year Country: Russia Mass: 14 kg fall: No found: 1854
Classification history:	Recommended: Iron, IAB-MG This is 1 of 119 approved meteorites classified as Iron



Photo: Don Edwards. Photo from the website: <https://encyclopedia-of-meteorites.com/Meteorite?id=23178>

It remains for us to check the information provided in the directories. There are fragments of "Sarepta" in many meteorite collections around the world.

Russian collections

In modern Russia, meteorites are recorded in the Meteoritics laboratory of the **Vernadsky Institute of Geochemistry and Analytical Chemistry** of the Russian Academy of Sciences (GEOKHI RAS).



RUS

ENG

Главная

О нас

О метеоритах

Коллекции

Музей

Метеоритная коллекция РАН: Состояние на 1 июня 1999 г

<div>Sarepta</div> <div>Сарепта</div>	<div>Железный</div> <div>IA-Og</div>	<div>48° 29' N, 44° 49' E</div> <div>Россия, Саратовская обл.</div> <div>Находка 1854.</div>	<div>1259 г</div>
---------------------------------------	--------------------------------------	--	-------------------

For some reason, the Saratov region is indicated in the table, and not the Volgograd region, however, at the time of the meteorite discovery in the middle of the XIX century, Sarepta belonged to the Saratov province. Currently, Sarepta is the southern district of Volgograd. The coordinates of the find indicated in the table: 48° 29'N, 44° 49'E, show a point on the Volga near the Svetly Yar district center. The table shows the weight of the three fragments in the GEOKHI collection – 1259 g.



GEOKHI RAS

I turned to the Scientific Secretary of the Committee on Meteorites of the Russian Academy of Sciences, an employee of the Meteoritics Laboratory of the Russian Academy of Sciences Anna Skripnik with questions about the accounting of fragments of the meteorite "Sarepta", pointed out some inconsistencies in the accounting documents. She gave me the information about 3 fragments of the "Sarepta", which are under the jurisdiction of the Committee on Meteorites. The first weighing 230.5 g is a plate; the second weighing 500.5 g is a chip and sawn on one side, exhibited in the Fersman Mineralogical Museum; the third weighing 528.7 g is a fragment with two saws. The first and the third are in the

collection of GEOKHI RAS. Anna Skripnik sent extracts from the primary record book of the meteorite collection, as well as old labels of the second fragment, which describes its history.

The history of the Geological Museum began with the formation of the Mineralogical Cabinet of the Kunstkamera in St. Petersburg, since 1831 housed in the Museum wing of the Imperial Academy of Sciences on Vasilievsky Island. Since 1898, it was called the Geological Museum of the IAS. In 1903, it was renamed as the Geological Museum named after Emperor Peter the Great. In 1906, the museum was divided into 2 departments: "Mineralogical" and "Geological and paleontological". In 1912, the

museum was renamed the Peter the Great Geological and Mineralogical Museum and the Academy of Sciences.

**Геологическій Музей
ИМЕНИ
ПЕТРА ВЕЛИКАГО
ИМПЕРАТОРСКОЙ АКАДЕМІИ НАУКЪ.
Коллекція метеоритовъ
1-2000.**

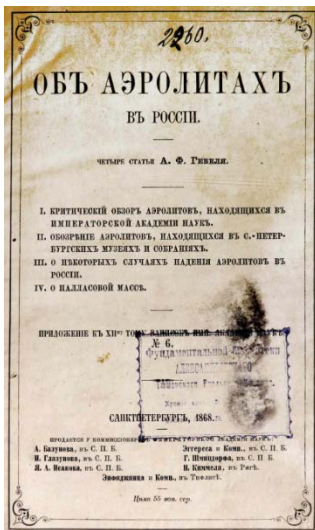
Коллекція метеоритовъ.								
Номеръ по порядку.	Названіе.	Типъ.	Вѣсъ въ кило и грам- махъ.	Мѣсто паденія.	Время паденія или на- хожденія.	Коллекторъ и время поступленія.	Номеръ коллекціи.	Примѣчанія.
46	"Сарепта"	сидеритъ- ГРУБОСТРУК- ТУРНЫЙ ОКА- ЗРИТ.	252.3g 252.17" 242	Сарепта Саратов- ской губ. Россія.	1854г.	Глишъ 1862г.	59 1.	Ш.кн. №2. Ш.к. IV; лотъ 1.
Колл. Толстопя- това 1926								
144	Сарепта	ГРУБОСТРУКТУРН. Октаэдрит	502.29	САРЕПТА, СА- РАТОВСКОЙ ГУБ.	НАЙДЕН в 1854г.	idem		Восст.; В.Ч.
Кочубей, П.А.								
623	Сарепта " "	Поллукитъ " "	557.00	" "	" "	" "	1278 2	Это не Неро!

Therefore, the above document was started in the period between 1903 and 1912, the records were supplemented already in Soviet times.

The first fragment (No. 46) was received in 1862 from K. Glitsch, its weight was first indicated 252.3 g, then corrected 252.17 g, and then - 242 g (collection No. 59/1).

The second (No. 144) was received in 1926 from the collection of M. Tolstopyatov weighing 502.29 g. The third fragment (No. 623) came from the collection of P. Kochubey, the date is not specified, the weight is 557.00 g (collection No. 1278/2).

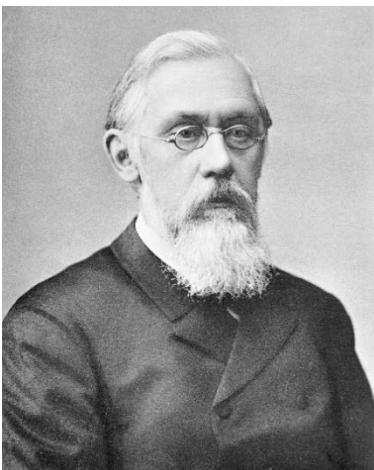
What happened to them in the future? The first (No. 46) in the book of Wülfing (1897) was listed as the only one in the collection of the Imperial Academy of Sciences in St. Petersburg.



In the article by **Adolf Göbel** "On aerolites in Russia", published in 1868, it is written: *"1862. Meteoric iron of Sarepta, polished and etched, with Widmanstetten figures; 252.7 grams by weight. Sent to the Academy as a gift by K. Glitsch from Sarepta."*

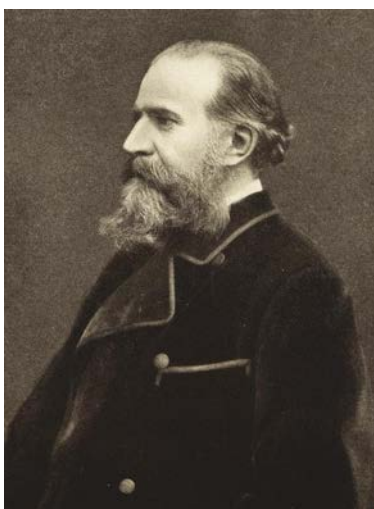
1862. Метеорное желѣзо Сарепты, отшлифованное и вытрав-
ленное, съ Видманштедтенскими фигурами; 252,7 граммовъ
вѣсу. Прислано Академіи въ даръ г. Гличемъ изъ Сарепты.

In the future, fragments were apparently beaten off from it, and its weight decreased to 230.5 g. Something was also removed from the second (No. 144), and its weight became 500.5 g. The weight of the third fragment (No. 623) also decreased from 557 g to 528.7 g.



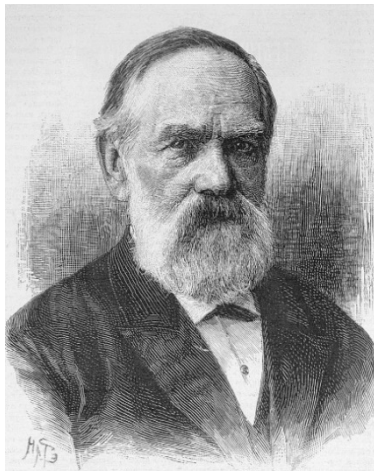
*Mikhail Tolstopyatov
(1836-1890)*

Professor **Mikhail Tolstopyatov** was a student of G. Shchurovsky; the first head of the Mineralogy Department (since 1870), was in charge of the Mineralogical Cabinet in Moscow University, vice-president of the Moscow Society of Naturalists. His collection of minerals and meteorites was included in the collection of the Academy of Sciences in 1926.



*Pyotr Kochubey
(1825-1892)*

The outstanding collector of minerals **Pyotr Kochubey** was an honorary member of the Mineralogical Society, an honorary member of the St. Petersburg Academy of Sciences (1876), Chairman of the Imperial Technical Society. His collection in 1906-1907 almost perished, in 1913 was sold by his son to the Geological Museum of the Academy of Sciences.



Julian Simashko
(1821-1893)

Julian Simashko. In the last years of his life, he became one of the largest collectors and researchers in St. Petersburg. The Wülfing's Reference Book (1897) indicates that Semashko's collection contains fragments weighing 7 g. After his death, the collection of meteorites was given to Ward's firm.

Published in 1891 in St. Petersburg, "Notes of the Imperial St. Petersburg Mineralogical Society", 2nd series, part 28, reported that in the collection of J. Simashko there are 2 fragments of "Sarepta" weighing 2.5 g and 4.5 g.

ЗАПИСКИ
ИМПЕРАТОРСКОГО С.-ПЕТЕРБУРГСКАГО
МИНЕРАЛОГИЧЕСКАГО ОБЩЕСТВА

ВТОРАЯ СЕРІЯ.
ЧАСТЬ ДВАНДЦАТЬ ПЕРВАЯ.

(Въ 5-мъ томахъ и 12-мъ томахъ по текстъ.)

VERHANDLUNGEN
DER
RUSSISCH-KAISERLICHEN MINERALOGISCHEN GESELLSCHAFT
zu St. PETERSBURG.

ZWEITE SERIE.
ACHTUNDZWANZIGSTER BAND.

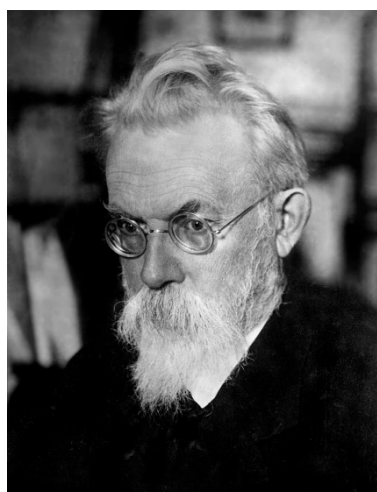
(Mit 5 Tafeln und 12 Holzschnitten im Text.)



С.-ПЕТЕРБУРГЪ.
Типографъ А. Баркова (Изд. 1891, 7-е, 8-е, 9-е).
1891.

52	1854	Sarepta, Gouv. Saratow, Russie.	2.5
		Шлифов. плитка.	
		Осколокъ.	4.5
		Найденъ въ Калмыцкой степи, на правомъ берегу Волги, въ 30 миляхъ отъ Сарепты, Царицынскаго Уѣзда Саратов. Губ. Первонач. вѣсъ былъ 14325 граммъ.	

In the first message of J. Auerbach about the discovery of the meteorite "Sarepta", he informs about the need to send its fragments to various scientific societies. In particular, he calls the Academy of Sciences in St. Petersburg. In 1934, the USSR Academy of Sciences moved to Moscow. At the same time, all academic institutions moved. The story is described on the website of the Committee on Meteorites of the Russian Academy of Sciences: *"In 1922, on the basis of the meteorite collection of the Mineralogical Museum, a Meteorite Department was established; in 1935, a Meteorite Commission at the Lomonosov Institute of the Academy of Sciences of the USSR Academy of Sciences; in 1939, the Committee on Meteorites of the USSR Academy of Sciences; since 1991, the Committee on Meteorites of the Russian Academy of Sciences (KMET). Currently, KMET is located at the Vernadsky Institute of Geochemistry and Analytical Chemistry (GEOKHI) of the Russian Academy of Sciences. The Meteoritics Laboratory of GEOKHI RAS inherits the scientific traditions and topics of the research work of the Committee on Meteorites of the Russian Academy of Sciences and the Laboratory of Comparative Planetology and Meteoritics of GEOKHI RAS. The Laboratory oversees the National Collection of Lunar Images, the Meteorite Collection of the Russian Academy of Sciences, the Museum of Extraterrestrial Matter of the Russian Academy of Sciences and the meteorite exposition at the Fersman Mineralogical Museum of the Russian Academy of Sciences"*.



Vladimir Vernadsky
(1863-1945)

Vladimir Vernadsky. Graduated from St. Petersburg University in 1885, among his teachers he named V. Dokuchaev, D. Mendeleev, A. Beketov and others. From 1890 he taught at the Imperial Moscow University. He lectured and wrote textbooks on mineralogy, crystallography and the history of natural science. In 1908 he was elected an academician of the Imperial St. Petersburg Academy of Sciences. In 1911 he moved to St. Petersburg, where he headed the Mineralogy Department of the Geological Museum of the Imperial Academy of Sciences. In 1921, he headed the Meteorite Department of the Peter the Great Geological and Mineralogical Museum of the Russian Academy of Sciences, which he headed until 1939.

V. Vernadsky was also the chairman of the Commission for the Study of the Natural Production Forces of Russia, one of the creators of the "GOELRO Plan". Since 1927, he headed the Biogeochemical laboratory at the USSR Academy of Sciences. After the start of the war, he was evacuated to Kazakhstan. He returned to Moscow in 1943.

V. Vernadsky is considered as the "father" of Russian meteoritics. Academic V. Vinogradov wrote: *"V. Vernadsky attached great importance to the study of meteorites and cosmic dust. He believed that a deep and precise study of meteorite matter would serve to explain the phenomena of the universe."*

On the pages of the journal of the Royal Astronomical Society of Canada (issue 32, p. 196) published a list of meteorites of the Soviet Union, as of January 1, 1938 (compiled by Igor Astapovich). It states that our meteorite is stored in the "Lomonosov Moscow Institute of the Academy of Sciences". In 1939, the Institute was transformed into the Committee on Meteorites of the USSR Academy of Sciences.

No.	Meteorite	Type	Fell	Found	Museum	Nininger No.
67	Saratow.....	C	1918 July 21	A.S.	R 42
68	Sarepta.....	O	1918 Sep. 6, 1854	1854	"	R 43

Abbreviations

A.S.—	Lomonossov's Institute of the Academy of Sciences, Moscow.	Ac—	Achondrite.
Ch.U.—	Charkov University.	O—	Octahedrite.
O.U.—	Odessa University.	H—	Hexahedrite.
L.U.—	Leningrad University.	P—	Pallasite.
M.U.—	Moscow University.	Go—	Gowardite.
K.U.—	Kazan University.	At—	Ataxite.
C—	Chondrite.		
R—	List of Russian meteorites, Our Stone-Pelted Planet, p.202, 1933.		
S—	List of Siberian meteorites, Our Stone-Pelted Planet, p.206, 1933.		
PA—	List in Popular Astronomy, v.45, p.451, 1937.		
CE—	List of Central European meteorites, Our Stone-Pelted Planet, p.193, 1933.		



*Igor Astapovich
(1908-1976)*

Igor Astapovich. He has published more than 400 scientific papers. During over 50 years of observations he registered several tens of thousands of meteors. In 1933, I. Astapovich conducted a scientific analysis of materials on the flight and explosion of the Tunguska meteorite. In the 30s, he discovered records of barographs from 14 stations in Siberia and several in the European part of Russia with registration of the air wave from the explosion, which independently determined the explosion moment. I. Astapovich studied the seismic and electrophonic phenomena accompanying the Tunguska meteorite and determined the southern version of its

trajectory. He was one of the first to propose a cometary hypothesis of the nature of the “Tunguska” meteorite.

In the book "**Meteorites of the USSR. Collection of the Academy of Sciences of the USSR**" (Alexander Zavaritsky and Lydia Kvasha, 1952) there is a description of the meteorite "Sarepta". The preface of the book says that it does not address such issues as the circumstances of the fall or the discovery of meteorites at all. It was found in Sarepta, now the city of Krasnoarmeysk, Stalingrad region, with coordinates 0448, 485 - longitude 440.8 from Greenwich, 480.5 – latitude, which corresponds approximately to modern Volgograd. The find of 1854. Iron. Octahedrite, coarse-grained. 1 copy, 13,352 kg. The main mass is kept in the museum of the University Berlin. Observations are described when etching a sample stored in the USSR, which is a plate about 1.5 cm thick and resembles a right-sided triangle in shape. Chemical analysis made by J. Auerbach shows that the meteorite consists of iron (95.9%), nickel (2.7%), schreibersite (1.3%).



*Alexander Zavaritsky
1884-1952*



*Lydia Kvasha
1909-1977*



Сарепта (Sarepta)

Синоним: Саратов (Saratov).
г. Сарепта, теперь г. Красноармейск, Сталинградской обл., РСФСР.
0448,485.

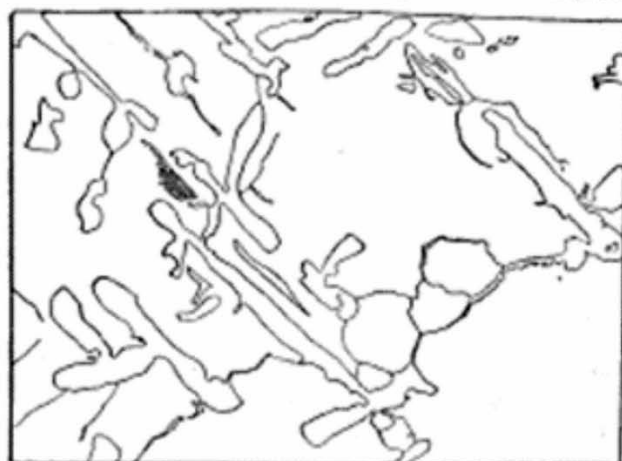
Находка 1854 г.

Железный. Октаэдрит, грубоструктурный.

1 экземпляр, весом 13,352 кг.

Главная масса хранится в музее Берлинского университета.

Образец № 46 представляет собою выпиленную пластину формой почти равностороннего треугольника, с длинной стороной около 6 см и толщиной около 1,5 см. На полированной поверхности видны многочисленные включения удлиненной формы, располагающиеся по трем направлениям под



Фиг. 26. Октаэдрит Сарепта. Микроструктура. Включения шreibерзита.
D=18,3 мм

углом 60° и образующие сетку, отвечающую балкам октаэдритовой структуры (фиг. 26).

Под микроскопом видно, что эти включения слабо отличаются от железа светложелтым оттенком и окраской; они очень твердые и не протравливаются ниталом; вероятно, это шreibерзит. Такие включения имеют обычно несколько закругленные и неправильные очертания. В свою очередь они содержат округлые зерна камасита, быстро протравливающегося ниталом. Травление ниталом в течение 2—3

сек. проявляет также грубое зернистое строение, не видимое на нетравленной полированной поверхности. Камасит травится легче, чем обычно, и после травления резко выступают включения тэнита. Обращают внимание относительно редкие узкие полосочки тэнита между широкими (более 2 мм) балками камасита. Далее наблюдаются более неправильные включения тэнита, иногда также пертитовидные прорастания тэнитом камасита. Иногда, наоборот, в относительно широких тэнитовых полосках попадаются «антипертитовидные» включения камасита.

В сильно протравленном участке под микроскопом железо обнаруживает своеобразную структуру, представляя собою срастания основной массы с темными решетками округлых сростков и неправильно округлых зернышек, ее переполняющих. Эти включения и решетки равномерно распределены в основной массе.

При среднем травлении местами видно, что камасит неоднороден: в основной массе, густо переполняя ее, находится мелкое, округлые зернышки, несколько труднее травящиеся. Размеры их 0,01—0,04 мм.

Химический состав, вес. %:
(анализ Ауэрбаха, 1864)

Fe	95,937
Ni	2,657
Шreibерзит	1,315
Sa	0,017
SiO ₂	0,020
	99,946

Литература

- И. Ауэрбах. Сообщение о метеорите Сарепта. «Бюлл. Моск. об-ва испытат. природы», XXVII, 1854, № 4, 504.
M. Haidinger. Über die Untersuchung von Herrn J. Auerbach und chemischen Analyse. «Sitzb. Wien. Akad.», 46, Abt. 2, 1862 (1863) u. 1864, 496—497.

The list of references contains a report on the meteorite "Sarepta" by J. Auerbach in the Bulletin of the Moscow Society of Naturalists (XXIV of 1854, No. 4, p. 504), as well as a report by W. Haidinger "Coarse-grained meteorite from Breccia" about J. Auerbach's research and comparative chemical analyses. Published by the Royal Academy in Vienna (1864, vol. 46, part 2, pp. 496-497).

In 1986, the "Catalog of Meteorites of the collection of the Soviet Union" was published (compiled by: **Yavnel A., Ivanova A., Zaslavskaya N.**, editor prof. Shukolyukov J.) which provides information on the presence of samples of 630 meteorites (166 domestic and 464 foreign) in 73 collections of the Soviet Union as of 01.01.1985. An extract from the Catalog was also sent to the author by **Anna Skripnik**.

САРЕПТА (SAREPTA)

РСФСР, Саратовская обл.

Находка 1854 г.

I экземпляр весом 13,352 кг. Главная масса в Берлинском университете.


Железный 1A-06

АН СССР:	№ 46	230,5 г	пл.
	144	500,5	обл. (1)
	623	528,7	ч.кнд.эвз. (2)
ЛГМ:	№ 191	31,5 г	пл.
АН ЭССР:	№ 28	41 г	отп.куч.
ЛГУ:	№ -	5 г	оск. мелкие

On the website <http://www.meteoritica.ru> (Dmitry Kazakov's project "Meteorites of Russia") there are photos and information about meteorite "Sarepta". It is indicated that the main part is located at the University of Berlin. In a telephone conversation with me, Dmitry Kazakov expressed genuine interest in my research.

МЕТЕОРИТЫ РОССИИ*
 ПРОЕКТ ДМИТРИЯ КАЗАКОВА

О ПРОЕКТЕ / ПРОДАЖА / ПОКУПКА / ГАЛЕРЕЯ / КОНТАКТЫ



Сарепта

Тип: Железный
Находка 1854г

Место находки – Саратовская область.
Этот железный октаэдрит имеет довольно внушительную массу – 13,352 кг. На сегодняшний день главная масса метеоритного тела находится в Берлинском

In 2019, the book "Meteorites of Russia" was published, the author is **Sergej Kolisnichenko**. It contains information about our meteorite. Unfortunately, there are some errors in the beautifully presented, interesting and informative book from previous domestic sources. The coordinates of the city of Krasnoarmeysk in the Saratov region, not the Volgograd region, are indicated; the person who found it is unknown, although it should be Konstantin Glitsch; the main mass is not in the Berlin University, but in the Berlin Museum of Natural History (it is correct to specify not the "main mass", but the "largest fragment"). In the photo from the Fersman Mineralogical Museum should be indicated that this is not the meteorite itself, but its fragment. These errors were made with reference to the data of the GEOKHI RAS.



In the Wülfing reference book (1897) there is mention of two fragments of "Sarepta" in St. Petersburg, weighing 252 g and 44 g. The first is in the Mineralogical Museum of the Imperial Academy of Sciences, headed by Director F. von Schmidt. The second one is in the mineralogical museum of the Mining Institute, which was reported by mining engineer M. Melnikov. Currently, there are several fragments of "Sarepta" in St. Petersburg.

The first one is in **the Mining Museum of St. Petersburg Mining University** on Vasilievsky Island. Among the 25 exhibition halls there is Hall No. 15 dedicated to meteorites. There are more than 800 items in the museum's collection. I called the main curator of the museum **Olga Tochnova**. She confirmed that in their collection there is a fragment of the meteorite "Sarepta" weighing 21.61 grams. He got into their museum at the beginning of the XX century from a collector. The Buchwald Handbook (1975) lists a fragment of 21 g. In the article by V. Kolomensky and E. Gusskova "Catalog of meteorites of the collection of the Leningrad Mining Museum on January 1, 1979" indicates a fragment of "Sarepta" weighing 31.5 g, as in the Catalog of Meteorites of the collection of the Soviet Union described above and published in 1986. It is possible

that the information about the presence of a fragment weighing 31.5 g in the Mining Museum in the above-mentioned articles and Catalog is erroneous.

There are small fragments in **the Mineralogical Museum of St. Petersburg State University**. There is information on the museum's website that more than 75 exhibits are presented in the memorial cabinet named after V. Dokuchaev. Among them are several small fragments of "Sarepta" with a total weight of 5 g, the largest 1.8 and 1.2 grams.



Foto: https://media.izi.travel/210d6d25-215f-417e-9174-10091697e3c9/3d50e345-2bb2-4ed0-abd8-7ae5ae36deea_800x600.jpg

However, in the book G. Anastasenko, V. Krivovichev "In the halls of the Mineralogical Museum of St. Petersburg State University" of the 2011 edition, it is indicated with an error that there is a fragment of "Sarepta" weighing 338.0 g in the museum and that it was found in 1902 in the Irkutsk region. This is erroneous information, which was confirmed by the museum staff.

Galina Barkhudarova, a researcher at the museum, informed me that small fragments of "Sarepta" came to them at the beginning of the XX century from a well-known mineral dealer Krantz. In the museum they are stored in a small box.

There is a **Vernadsky State Geological Museum** in Moscow, it is located opposite the Kremlin. It used to be a museum of the university, it also has a collection of meteorites. The history of this collection began at the beginning of the XIX century. *"V. Vernadsky attached great importance to the study of meteorite matter. Among the*

newly formed collections, a special place is occupied by the collection of meteorites, the allocation of which was started in 1897, when it turned out that the museum has a sufficient number of samples of extraterrestrial matter (Report on the state and actions ... 1898, p. 163). At first, the collection was processed by A. Shklyarevsky, who published in 1898 a catalog of meteorites stored in the Mineralogical Cabinet in French in the "Yearbook on Geology and Mineralogy of Russia", which included 51 names. Compiled under the guidance of V. Vernadsky catalog "Inventory. The collection of meteorites" by the end of 1910 consisted of 114 samples, and almost half (54 fragments of 44 meteorites) entered the mineralogical cabinet in the period 1890-1910. The museum's existing collection, consisting of fragments of 68 meteorites, was mainly created under V. Vernadsky. The catalog of the collection has not lost its relevance yet." (Chernenko V., Andreeva I., Samsonov N. "Vladimir Ivanovich Vernadsky and the collection of the Mineralogical Cabinet of the Imperial Moscow University").

An issue of the magazine "VM-Novitates" was dedicated to the meteorite collection existing in the museum. News from the Vernadsky State Geological Museum" No. 15, published 01.01.2010, It published an article and a catalog of the collection of meteorites stored in this museum. Authors – Vilen Feldman, Doctor of Geological and Mineralogical Sciences, Associate Professor of the Department of Petrology of the Geological Faculty of Moscow State University; Zoya Bessudnova, Candidate of Geological and Mineralogical Sciences, the chief specialist is the responsible curator of the Vernadsky State Geological Museum of the Russian Academy of Sciences.

VM-Novitates

Новости из Геологического музея им. В.И.Вернадского

Государственный Геологический Музей им. В.И.Вернадского РАН

125009 Москва Моховая д.11 корп.11

VM-Novitates	№ 15	28 с., 14 рис.	Москва, 2010
--------------	------	----------------	--------------

УДК 523.681

ISSN 1029-7812

Метеориты в собрании Государственного Геологического музея им. В.И. Вернадского РАН (каталог коллекции)



Vilen Feldman



Zoya Bessudnova

4

VM-Novitates

№ 15, 2010

во Фрайберге (Германия).

К 1858 г. в Музее, судя по «Каталогу...», составленному Г.Е. Щуровским (1858), было в наличии уже 6 образцов метеоритов. В ориктогностическом собрании 4 метеорита: «№117 – железо, метеорическое, с оливинном (Палласово железо), найденное в Енисейской губ. в 20 верст. от Енисея, между речками Убеем и Сисимом. Весом в 5 унцов без драхмы (145,575 г.)¹; №118 – железо, в 1 фунт 5 унцов весом (507,305 г.), с одной стороны отполированное и вытравленное. Отрывок от куска, который найден Аптекарем Гличем в Калмыцкой степи; №121 – железо в аэролите, который весит 4 ½ унца (134,375 г.), из Смоленской губернии; №122 – железо в аэролите, весом в 2 драхмы (7,46 г.), из Ensisheim (Ensisheim, Франция – авт.)» (1858, л.5, 50б.). И еще по одному метеориту (это были кусочки от метеорита Палласово железо – авт.) входило в коллекцию Енграфа Петровича Ковалевского (1790-1867) и в геогностическое собрание Малого кабинета.

В «Кратком отчете о трудах Императорского МОИП» за 1855 г. в торжественном заседании по случаю 50-летнего юбилея общества было объявлено, что «бывший Император Австрийский Франц I благоволил также обществу присылкою редкого метеорита» (Архив МОИП, д.318). Так как по уставу общества все дары поступали в Музей университета, то, судя по «Каталогу...» (Щуровский, 1858), Франц I подарил действительно редкий метеорит Энзисем (Ensisheim), упавший в 1492 г. и описанный в «Каталоге...» под №122².

Г.Е. Щуровский (1858, л. 374) отметил также, что был куплен «глисовый слепок метеорического железа, найденного Г. Гличем в Калмыцких степях». Таким образом, в 1858 г. в музее была часть (≈558 г) настоящего метеорита, найденного Гличем, и глисовый слепок того же метеорита. В каталоге коллекции метеоритов, составленном А.О.Шкляревским в 1898 г., этот метеорит не значился.

Grigory Shchurovsky is the first professor of the Department of Geology of Moscow University, held this position for 45 years, a great popularizer of science.

His student **Anatoly Shklyarevsky** (1869-1902) compiled a catalog of the meteorite collection in 1898.

Orictognostic analysis is the recognition of minerals by their appearance.

So, in the catalog of 1858 (compiled by G. Shchurovsky), No. 118 – *"a fragment of the meteorite "Sarepta" weighing 1 pound 5 ounces (507.305 g)"*. If we count the Russian pound - 409.51 g, 1 ounce – 29.86 g, then the weight of the fragment will be 558.81 g. The article first shows the incorrect weight of the fragment, which is confirmed in the second column of the publication, where the error has already been corrected and 558 g is correctly indicated.



Grigory Shchurovsky

As we remember, K. Glitsch asked J. Auerbach to make a plaster cast of the meteorite found and cut out several fragments for different scientific societies. I would like to know why the fragment of "Sarepta" did not get into the catalog of the collection of the geological museum in 1898, and where did it and the plaster cast go?

I wrote to the author of this article, Zoya Bessudnova, and asked her to clarify these last questions. She answered me right away. *"I have only one most likely option as to why in 1898 the [fragment] of the meteorite "Sarepta" was no longer in the Mineralogical Museum of the Imperial Moscow*

University: Johann Auerbach had been the curator of the Museum of the University since 1861, and in 1865 he became the first head of the University founded in the same 1865 Petrovskaya Academy of Agricultural and Forestry (now the Russian State Agrarian University – Moscow Timiryazev Agricultural Academy). According to the will of Auerbach, who died in 1867, all his collections (minerals, fossils and meteorites) formed the basis of the museum in the [Petrovskaya] Academy. After him, Hermann Trautschold became the keeper. I think that he transferred the Sarepta meteorite from Moscow University to the Museum at the new educational institution, given Auerbach's merit in acquiring this [fragment] meteorite. The meteorite "Sarepta" could be in the Petrovskaya Academy of Agricultural and Forestry".

The website of **the Russian State Agrarian University – Moscow Timiryazev Agricultural Academy** has a detailed description of the history of the museum collection, including meteorites. This collection is located in the Auerbach Geological and Mineralogical Museum. In 1867, the bequeathed exhibits belonging to J. Auerbach, after his death, became the beginning of this collection. In 1868, the head of the mineralogical cabinet, H. Trautschold, made its first description, in which there were 22 samples of meteorites.



Hermann Trautschold
(1817-1902)

Hermann Trautschold was a full member since 1858 of the Moscow Society of Naturalists and its secretary from 1872 to 1886. He taught at Moscow University since 1863. Professor of the Petrovskaya Agricultural and Forestry Academy from 1869 to 1888, was a prominent scientist in the field of paleontology and stratigraphy of carboniferous, chalk and Jurassic deposits of the European part of Russia. In 1878, Hermann Trautschold published an article "Collection of meteorites in the Petrovskaya Academy" in the collection "The History of the Petrovskaya Academy of Agricultural and Forestry" (year one, issue 3). Among the iron meteorites were 2 fragments of "Sarepta": 302.0 g and 82.0 g. In the collection of the academy there were also 4 plaster models of the meteorite "Sarepta". In 1888 he retired

and returned to Germany. In the article by N. Chukhrova and K. Komizerko "Meteorites in the collection of the Geological and Mineralogical Museum of the Moscow Timiryazev Agricultural Academy", published in 1955 in the collection "Meteoritics" of the Academy of Sciences of the USSR (issue 12), there is no mention of our meteorite.

The current head of the museum, Sergey Grishin, kindly invited me to the museum, showed me the accounting book they had, opened in 1990. I made sure that there are no records of fragments of "Sarepta" in it, and Sergey Grishin did not have any associations with this name. Initially, the museum occupied 300 square meters in the main rector's building of the academy, and now about 50 square meters in building No. 17. It has a lot of interesting exhibits, antique cabinets, samples. There is a stand dedicated to the founder of the museum, whose name it is named after - Johann Auerbach. Sergey Grishin surprised me by showing me a table preserved from the first years of the museum's existence, calling it "Auerbach's Table".

To understand where a fragment weighing 558 g, belonging to J. Auerbach, inherited by H. Trautschold, could have got to, let's turn to the article by I. Starodubtseva and V. Mitta "Hermann Trautschold and his contribution to the study of the Central Russian Jurassic", published in the collection "VM-Novitates. News from the Vernadsky Geological Museum" No. 10 dated 12/24/2002. It states that in 1888 H. Trautschold left Russia and *"was forced to give part of his paleontological collection."* Does this mean that the fragment of "Sarepta" also got into either the Polytechnic School of Lisbon or the University of Strasbourg? To my question about meteorites, Iraida Starodubtseva replied that she knew nothing about Trautschold's activities. In the book of Wülfing (1897), neither Lisbon nor Strasbourg appear among the readers of the fragments of "Sarepta".

The Earth Science Museum of Moscow State University, which is located in a high-rise building of the University on Vorobyovy Gory, is currently undergoing renovation. There is an exhibition dedicated to meteorites. I met researcher at the museum **Mikhail Vinnik**. Dr. Vinnik participated in many expeditions to search for meteoritic matter, including in the Volgograd region. After listening carefully to me, he promised to find out what could be in their museum about our meteorite. A few days later, he informed me that they had nothing about our meteorite.

European collections

In the **Museum für Naturkunde Berlin** has one of the largest collections of meteorites in the world. It has almost 1,500 meteorites in the form of 4,100 fragments. This museum used to belong to the Alexander Humboldt University and in 2009 became independent. Therefore, all references to the fact that the Sarepta meteorite is stored at the University of Berlin only indicate that these references are outdated. The collection of meteorites in the Museum für Naturkunde Berlin is handled by researcher **Dr. Ansgar Greshake**. I wrote him a letter asking him to send a description of the Sarepta meteorite and its photo. His answer pleased me: "The museum has a fragment measuring 20 x 9 x 2 cm and weighing 1858.9 g."

And this is really the largest fragment of the "Sarepta" known to us.

The Natural History Museum Vienna (Naturhistorisches Museum Wien) houses not only one of the oldest, but also one of the largest collections of meteorites in the world. It contains more than 10,300 objects, including more than 2,550 different meteorites. This collection is the third in the world after the American National Museum in Washington and the large collection of Antarctic meteorites at the National Institute of Polar Research in Tokyo. There are 1,100 meteorites on display in the Vienna Museum in Hall No. 5, and this huge exposition cannot fail to impress. Contacting this museum brought me a prompt response, which expanded my understanding of the fragments of our meteorite. The curator of the museum's meteorite collection, **Dr. Ludovic Ferriere**, reported that they have two fragments: NHMW-A683 / 393.61 g (10.5 x 9.5 x 0.6 cm); NHMW-A684 / 357.13 g (12.5 x 11 x 0.6 cm). According to him, these fragments came to the museum on October 22, 1862 from the mineral trader Ernst Baader. But in the article of W. Haidinger's "The Iron Meteorite of Sarepta" (1862) it is stated that Konstantin Glitsch sent one fragment to the director of the museum Hoernes through his brother Ferdinand Glitsch (Niski, Saxony), the other - through Dr. Krantz.

The Arrangement of Collections of Meteorites

Author(s): Aristides Brezina

Source: *Proceedings of the American Philosophical Society*, Apr., 1904, Vol. 43, No. 176 (Apr., 1904), pp. 211-247

Published by: American Philosophical Society

Sarepta, Russia. Found 1854. Og. 19 gr. 9 cm. Alteration-zone, inner curve equalized, 1-3 mm. thickness.

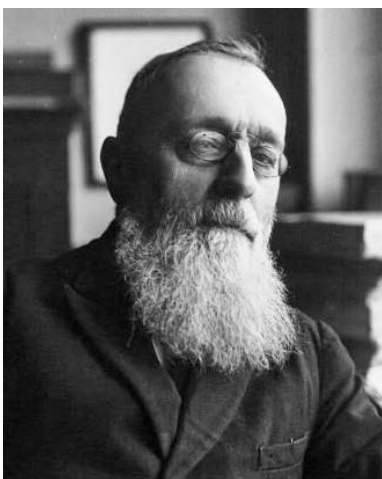


Aristides Brezina

Aristides Brezina's handbook "Collection of Meteorites", published in 1904 by the American Philosophical Society, mentions a fragment of the meteorite "Sarepta", stored in the Natural History Museum Vienna, weighing 19 g and measuring 9 cm.

Currently, the presence of this fragment in the museum is not confirmed, it may have been exchanged.

The National Museum of Natural History in Paris (Muséum national d'Histoire naturelle) has a Mineralogical Gallery. As indicated on the museum's website: *"The gallery has one of the largest collections of meteorites in the world: 5.4 thousand samples of about 1600 meteorites. Among them are the simplest chondrites and witnesses of the evolution of planets, individual fragments of celestial bodies, starting with the Alsatian meteorite of 1492 and ending with a stone that fell in Chelyabinsk in 2013... The first meteorites to join the collection of the National Museum of Natural History were from the personal collection of Rene Just Howie (1743-1822). Pierre-Louis Antoine Cordier (1777-1861) compiled the first catalog of meteorites in 1843 (27 samples). When he died in 1861, the museum's collection numbered 78 meteorites. His successor at the Department of Geology of the museum, Gabriel-August Debre (1814-1896), increased the collection to 1,000 copies. Under Stanislas Meunier (1843-1925) and Alfred Lacroix (1863-1948), this total number tripled."*



Alfred Lacroix
(1863-1948)

In 1938, V. Vernadsky reported that thanks to the most famous scientist in the field of meteoritics, **Alfred Lacroix**, the largest collection of meteorites at that time was gathered in Paris. Currently, *"... every year, several dozen samples are transferred to various institutions for scientific or art exhibitions. About a hundred samples are also loaned or donated for scientific purposes to researchers in France or abroad."* In the book of Wülfing (1897), the weight of 329 g of fragments of "Sarepta" in the collection of the museum in Paris is indicated. According to the Buchwald handbook (1975), there are fragments of "Sarepta" with a total weight of 973 g. I turned to the curator of the museum's meteorite collection,

Prof. Matthieu Gounelle helped me find information about 7 fragments of "Sarepta" with a total weight of 990.753 g: MNHN-GT-286 158.5 g; MNHN-GT-3054 4.8 g;

MNHN-GT-367 47.9 g; MNHN-GT-373 73.1 g; MNHN-GT-84 40.3 g; MNHN-GT-84PE1 0.653 g; MNHN-GT-866 665.5 g.

The Natural History Museum in London counts more than 10,000 of all known celestial bodies that have fallen to Earth, including those found in Antarctica. Until 1992 it was called **the British Museum (Natural History)**. I found catalogues of meteorites published by the museum in 1908 and in 1923.

In the 10th edition of the book "Introduction to the Study of Meteorites" with a list of meteorite collections (by **L. Fletcher**, keeper of minerals in the British Museum), published in 1908 in London, the meteorite "Sarepta" is presented. The collection contains fragments of "Sarepta" weighing 283 g.

BRITISH MUSEUM (NATURAL HISTORY)

CROMWELL ROAD, LONDON, S.W.

MINERAL DEPARTMENT.

AN INTRODUCTION TO THE STUDY OF METEORITES,

WITH A LIST OF THE METEORITES REPRESENTED IN THE COLLECTION.

BY

L. FLETCHER, M.A., F.R.S.,

KEEPER OF MINERALS IN THE BRITISH MUSEUM; FORMERLY FELLOW OF UNIVERSITY COLLEGE AND MILLARD LECTURER AT TRINITY COLLEGE, OXFORD.

[This Guide-book can be obtained only at the Museum; written applications should be addressed to "The Director, Natural History Museum, Cromwell Road, London, S. W."]

PRINTED BY ORDER OF THE TRUSTEES.

1908.

[All rights reserved.]

LONDON:

PRINTED BY WILLIAM CLOWES AND SONS, LIMITED, DUKE STREET, STAMFORD STREET, S.E., AND GREAT WINDMILL STREET, W.

In 1923, a "Catalog of Meteorites" was published with special instructions of those that are represented in the collection of the British Museum (Natural History), by **G. T. Prior**, Curator of the Geological Department of the British Museum.

**CATALOGUE
OF METEORITES**

WITH SPECIAL REFERENCE TO THOSE
REPRESENTED IN THE COLLECTION OF THE
BRITISH MUSEUM (NATURAL HISTORY)

BY

G. T. PRIOR, M.A., D.Sc., F.R.S.

KEEPER OF THE MINERAL DEPARTMENT OF THE BRITISH MUSEUM

LONDON:

PRINTED BY ORDER OF THE TRUSTEES OF THE
BRITISH MUSEUM.

SOLD BY

MESSRS. LONGMANS, GREEN & Co., 39 PATERNOSTER ROW, E.C.4;
MESSRS. B. QUARITCH, LTD., 11, GRAFTON STREET, NEW BOND STREET, W.1;
MESSRS. DULAU & Co., LTD., 34-36, MARGARET STREET, CAVENDISH SQUARE, W.1;
THE OXFORD UNIVERSITY PRESS, AMEN CORNER, E.C.4;
MESSRS. WHELDON & WESLEY, LTD., 2, 3 & 4, ARTHUR STREET, NEW OXFORD
STREET, W.C.2; AND
MESSRS. OLIVER & BOYD, TWEEDDALE COURT, EDINBURGH;
AND AT THE
BRITISH MUSEUM (NATURAL HISTORY), CROMWELL ROAD, S.W.7.

1923.

(All rights reserved.)

Sarepta, Saratov, Russia.

Found 1854.

Synonyms : Saratov.

Iron. Coarse octahedrite.

A mass of about 14 kg. was found on the right bank of the Volga, 20 miles from Sarepta (J. Auerbach, Bull. Soc. Nat. Moscou, 1854, no. 4, p. 504). Described by W. von Haidinger (Sitzungsber. Akad. Wiss. Wien, Math.-naturwiss. Kl., 1862 (1863), vol. 46, Abt. 2, p. 286, and 1864, vol. 49, Abt. 2, p. 497).

2 kg. in Berlin University, $\frac{3}{4}$ kg. in Vienna (Naturhist. Mus.).

Specimens : [33750], 223 grams; [33605(3)], 60 $\frac{1}{2}$ grams.

Sarepta, Saratov, Russia. Found 1854. Synonym: Saratov. Iron. Rough octahedrite. Weighing about 14 kg, it was found on the right bank of the Volga, 20 miles from Sarepta (J. Auerbach, Bulletin of Society Nature, 1854, No. 4, p. 504. Described by V. von Haidinger (meeting of the Acad. Sciences Vienna, Mathematics-Natural Sciences. cl. 1862, volume 46, part 2, p. 286; and 1864, volume 49, part 2, p. 497). 2 kg at the University of Berlin. $\frac{3}{4}$ kg in the Vienna Natural History Museum. Samples [in London]: [33750] 223 g, [33605 (3)] 60 $\frac{1}{2}$ g. Total – 283.5 g.



*Nevil Story Maskelyne
(1823-1911)*

A significant trace in the creation of the museum's meteorite collection was left by **Mervyn Herbert Nevil Story Maskelyne**. Since 1847, he headed the Department of mineralogy and enthusiastically replenished the collection of meteorites of the Museum in London. In the article described above by W. Haidinger "The Iron meteorite of Sarepta" in 1862, it is mentioned that K. Glitsch sent two fragments to London – to the British Museum 360 g and directly to Nevil Story Maskelyne – 35 g. In 1863, Neville Story Maskelyne published a Catalog of the meteorite collection of the Mineral Department of the British Museum (Maskelyne, Nevil Story. "Catalogue of the Collection of Meteorites exhibited in the Mineral Department of the British Museum"). Maskelyne

worked at the museum until 1880. In 1883, the museum moved to South Kensington. On the museum's website in the section "Meteorite Collection" there are reports about 4 fragments of "Sarepta" {inventory numbers: BM.33750; BM.36605(3); BM.1985,M294; BM.2005,M233}. Their weight is not indicated on the website, the third was received in 1985, in the reference book of M. Grady (2000) - 36 g. The last fragment, received in 2005, has a source: Dr. Jutta Zipfel. According to Dr. Zipfel, this fragment was from the collection of F. Paneth and its weight is 0.8 g.



*Karl Ludwig von Reichenbach
(1788-1869)*

Karl Ludwig Friedrich (Baron since 1839) von **Reichenbach** was an industrialist, engineer, chemist, naturalist and philosopher. K. Glitsch sent Baron von Reichenbach a fragment of "Sarepta", but its weight was not specified. The collection of meteorites of Baron von Reichenbach after his death came to the museum of the University of the German city of Tübingen in Baden-Württemberg. In an article by Dr. Aristides Brezina about the collection of the University of Tübingen, published in 1895, there is a description of the fragment of "Sarepta", but the weight is not specified. In the book of Wülfing (1897), a fragment of 247 g is indicated; in the Buchwald's handbook (1975) – 336 g; in the Grady's Handbook (2000) – 339 g.

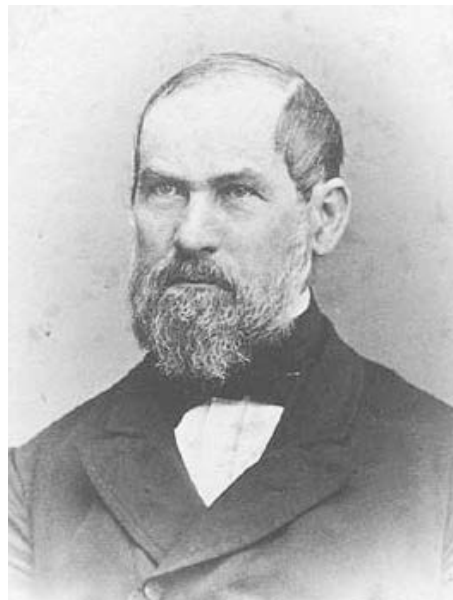
In the mineralogical collection of the **Museum in the Eberhard Karls Universität Tübingen** there are about 1000 fragments of meteorites mainly of the XIX century. The current collection of meteorites originated from the collection of the former Mineralogical Institute in 1919, the entire collection of Baron von Reichenbach got here. There is an electronic catalog on the museum's website, which contains data on 301 fragments of meteorites. There is a fragment of "Sarepta" (MGD-Me-2169) weighing 157.5 g. There is no information about other fragments, although a weight of 339 g was stated in Grady's handbook.



A fragment of "Sarepta" from the museum of the University of Tübingen.



Friedrich Krantz
1859-1926



Adam August Krantz
1808-1872

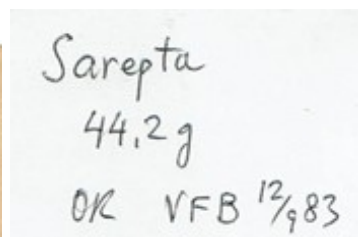
The German company “**Dr. F. Krantz**”, Bonn Germany, has a 190-year history of successful activity in the market of mineral supplies and equipment. It was not by chance that K. Glitsch sent a fragment of "Sarepta" weighing 250 g to this company in the 1860s. What is his fate? I received a kind reply from the head of the company, **Ursula Müller-Krantz**: *"looking through the old catalogs that remained in the company, I found two items showing that we had meteorite "Sarepta" and that Ward's in New York also had samples. But, unfortunately, there is not a single copy left in our collection. When A. Krantz died in 1872, his son-in-law T. Hoffmann succeeded him, and he sold the private collection of Adam August Krantz to the Mineralogical Museum in Bonn."*

There are two fragments of "Sarepta" in **the Mineralogical Museum of the University of Bonn**. This was reported to me by the curator of the meteorite collection of the Mineralogical Museum of the University of Bonn, **Dr. Anne Zacke**. *"A fragment weighing 2.8 g – from the collection of Adam August Krantz, after his death (1874) was purchased. The fragment weighing 44.2 g was obviously acquired in Vienna."* The pictures of the labels sent show that the second fragment was first given by the firm "H. A. Ward. 620 Division Street, Chicago" for \$20 to the owner «Julius Böhm. Wien I. Lobkowitzpl., 1». In the

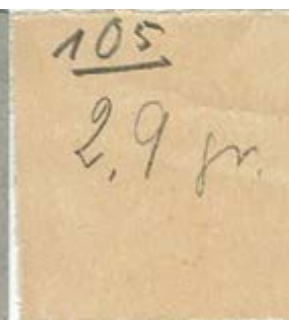
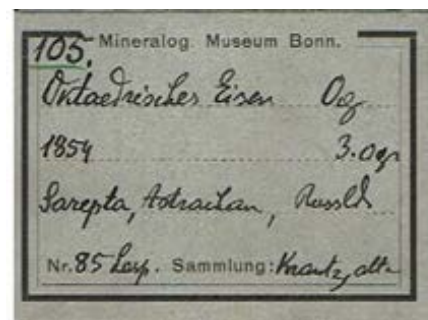
book of Wülfing (1897) in the Mineralogical Museum of the University of Bonn there was a fragment weighing 3 g. Another label shows the date of admission to the museum of the University of Bonn – 1917 from the Böhm collection and, obviously, for 100 marks. Judging by the photos of the labels of these fragments sent to me by Anne Zacke, I do not agree with V. Buchwald's conclusion that things are bad with meteorite labels in Germany.

Julius Böhm (1851-1917) was a famous musician – composer, kapelmeister, collected meteorites. He is not listed in Wülfing's book (1897). Perhaps, after his death, a fragment of 44 g from his collection was sold to the University of Bonn. The total weight of the two fragments coincides with that indicated in the Buchwald's Handbook (1975) - 47 g.

Meteoriten – Sammlung	
Nummer: M 87	Stückzahl: 1
Klasse:	169-11
Name:	Oktaedrisches Eisen 1854
Fundort:	Sarepta, Saratov / Russl.
Gewicht:	44,2 g



Meteoriten – Sammlung	
Nummer: M 85	Stückzahl: 1
Klasse:	169-11
Name:	Oktaedr. Eisen 1854
Fundort:	Sarepta, Astrachan / Russland
Gewicht:	2,8 g



Robert Phillips Greg (1826-1906), Manchester, England. He created in 1860 a catalog of meteorites and meteors, published in 1861. There is no information about "Sarepta", but 2 fragments of our meteorite were sent to him by Konstantin Glitsch. Also is no mention in the Wülfing's book (1897) that there is a fragment of "Sarepta" in the Manchester Museum of Owen College.

I wrote a letter to **the Manchester Museum of the University of Manchester**. **David Gelsthorp**, curator of Earth Science at the museum, replied: "I have looked through our catalog, and it seems that there are no meteorites from this place in our collection."

The Mineralogical Museum of the University of Strasbourg (Université de Strasbourg) has the second most important public collection of meteorites in France, which contains 450 samples. According to the data on the museum's website, the collection has hardly changed since 1918. In the book of Wülfing (1897) there is no mention of Strasbourg in the list of owners of the fragments of "Sarepta". Most of the meteorites were acquired in 1900 under the supervision of Prof. P. Groth and E. Cohen. The suppliers were Voigt-Hochgesang in Göttingen and Krantz in Bonn. The Buchwald's Handbook (1975) claims a fragment weighing 119 g. In the list of meteorites stored in the collection posted on the museum's website, there is one

fragment of "Sarepta", but its weight is not specified. The museum has a small collection of plaster models of meteorites, it was founded by Prof. E. Cohen. It is the second largest model (44) in Europe after the Vienna Museum of Natural History. The Voigt-Hochgesang company from Göttingen (1875 to 1900) was a supplier of crystallographic and optical instruments, as well as mineral samples.

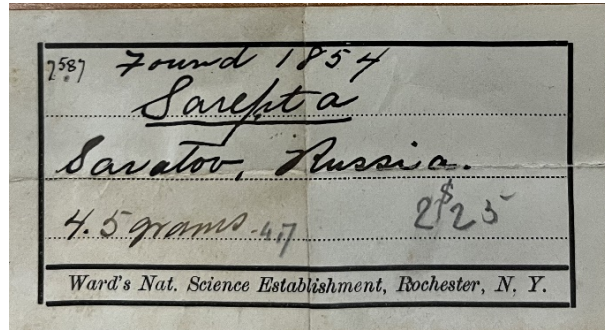
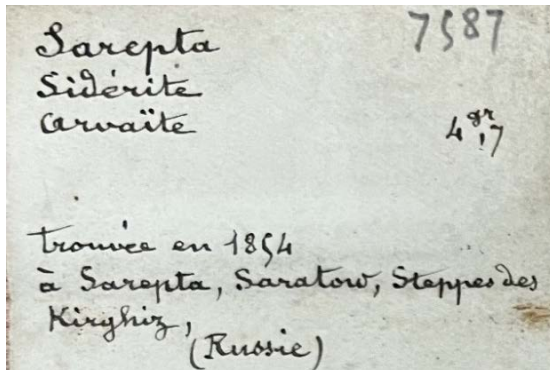
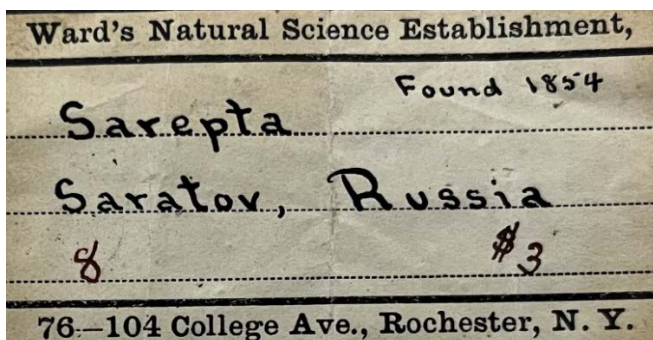
In **Stuttgart** at the end of the XIX century there were three collections of meteorites: in the natural cabinet (which later became the Museum of Natural History), the technical institute and the imperial real gymnasium. In the book of Wülfing (1897) there is an entry that a fragment of "Sarepta" weighing 632 g is stored in the nature cabinet. In the Buchwald's reference book (1975) there is also this fragment. Confirmation of this could not be obtained.

The Stuttgart State Museum of Natural History (Naturkundemuseum Stuttgart) has been in existence since 1791, and dates back to 1600 with the Kunstkammer of the Duke of Württemberg. In February 1944, many valuable exhibits were destroyed during the bombing. In September 1944, the museum burned to the ground. After the war, in 1950, the natural History collection was renamed the Stuttgart State Museum of Natural History. The expositions were opened in 1956 in Rosenstein Castle. In 1985, a new museum building was opened at the Lion Gate (Museum am Löwentor). Currently, the Stuttgart State Museum of Natural History is one of the largest in Germany, its expositions are located in the Rosenstein Castle and at the Lion Gate. The mineralogical collection is stored in underground vaults at the Lion Gate.

The Mineralogy and Geology Institute in the Julius-Maximilians-Universität of Würzburg (Julius-Maximilians-Universität Würzburg) in Germany had to store a fragment of "Sarepta" weighing 716 g, which was slated by Konstantin Glitsch. However, as stated on the university's website: "... during the Second World War and the subsequent occupation of Würzburg by American troops, the collection suffered great losses as a result of destruction and looting. In the next three decades, the collection of minerals was closed for viewing." Currently, there is a mineralogical museum of the Geography and Geology Institute in the Julius-Maximilians-Universität of Würzburg, but a small meteorite collection in it began its existence only in 1978. The reference books of Wülfing (1897) and Buchwald (1975) state that there was a fragment weighing 488 g in Würzburg. There is no confirmation of this yet.

The website of **the Vatican Observatory** states that the collection of meteorites includes more than 1100 samples from more than 500 different falls, which amounts to almost 150 kg of extraterrestrial matter. The beginning of this collection was laid by Henri-Charles Marquis de Mauroy (1848-1927) in 1907, who will present 104 items of his collection to the Vatican. In 1912, he presented another 50 samples. After his death, his widow donated 400 more meteorite fragments in 1935. In the future, the collection

was replenished. The history of each fragment is described in detail in the database. In the "Inventory of Meteorites of the Vatican Collection", published in 1984, there are 2 fragments of "Sarepta" - 8 g and 5 g. Monica Grady's Handbook (2000) reported the presence of "Sarepta" in the Vatican collection weighing 12.5 g. Currently, **Robert Macke** is the curator of the collection of meteorites of the Vatican Observatory. He said that *"there really are two small specimens from Sarepta in our collection. Both were originally part of the collection of Adrian Charles Marquis de Mauroy. A sample weighing 8.2 grams was donated to the Vatican Observatory in 1905. The 4.8g sample was donated after he passed away in 1927. (There is an entry for 1913 in his catalog) ... Obviously, he obtained samples from Ward's firm in Rochester, New York, USA... paid \$3 for a sample weighing 8 g and \$2.25 for a sample weighing 4.8 g (labeled 4.7 g). The year of purchase is not listed in our database, but it was probably before 1900."*



In the UK, **Cambridge** has the **Hudson Institute of Mineralogy**. On the website of this institute <http://www.mindat.org> there is a description of our meteorite and the coordinates where it was found are indicated: 48° 30' 59" N, 44° 31' 56" E, that is, slightly different than in domestic publications. These are the coordinates of the colony of Sarepta (the modern museum "Old Sarepta" in Volgograd). This site contains photos and a description of a fragment of this meteorite measuring 5.8x3.6x2.0 cm and weighing 75.7 g, stored in their museum. There are several photos of this fragment, an old coin and a box with the inscription in German "Iron meteorite Sarepta, Russia". For me, this is an amazing find: an old label on which the inscription in German is barely visible: "University of Erlangen. The iron meteorite".

The Friedrich-Alexander-Universität Erlangen-Nürnberg is located in **Nuremberg, Germany**. How did this fragment end up in Cambridge? I wrote a letter to the university archives in Nuremberg, asking: "How and when did this fragment get to Cambridge, and when did it get to them?" I received the answer from the leading researcher of the mineralogical collection of the University **Udo Andraschke**: *"Unfortunately, the documentation of our mineralogical and geological collection is in a deplorable state, so we cannot help with your question. We also don't understand how this fragment got there"*.



In Estonia, at the **University of Tartu** (Tartu Ülikool, Tartu formerly called Dorpat), which Konstantin Glitsch graduated from, there was another fragment weighing 41 g. Published in the collection "Archive of Natural History of Lithuania, Estonia and Courland". Author – C. Grewingk, "List of the meteorite collection of the University of Dorpat in December 1882".

The collection of meteorites of the university after 1946 was transferred to the Geological Institute of the Republican Academy of Sciences. In the article by K. K. Orviku "Meteorites of the collection of the Geological Institute of the Academy of Sciences of the Estonian SSR (Tartu)", published in the collection "Meteoritics" of the Academy of Sciences in the USSR, issue 12, 1955, one fragment of the meteorite "Sarepta" weighing 41 g is indicated.

My request to send a photo and a description of the fragment was kindly answered by the Dean of the Faculty of Science and Technology of the University of Tartu, Professor of Geology **Dr. Leho Ainsaar**, he sent a link online-catalog where information about this fragment is provided.



Constantin Grewingk



— 156 —

Nr.	Fund- oder Fallzeit.	F a l l o r t .	Gewicht in Grm.
28	1850	Ruffs Mountains, S-Carolina, V. St.	35
29	1850	Salt River, Kentucky, V. St. . . .	81
30	1850	Seneca Falls, Cajouga Co. New-York	50
31	1853	Lion-River, Namaqualand, Süd-Afrika	30
32	1853	Tazewell, Tennessee, V. St.	56
33	1853	Union County, Georgia, V. St. . .	7
34	1854	Madoc, Ober-Canada	28
35	1854	Werchne-Udinsk, Irkutsk, O-Sibirien	115
36	1854	Sarepta , Gouv. Saratow, Russland.	41

Üldinfo (general information)

Kollektsiooni nr. TUG 1185

Eksemplari nr. 1185-163

Tüüp (Tun) terviku osa (part of the whole)

Rühm (Грынна) raudmeteoriidid (iron meteorite)

Lokalteet Sarepta

Lisainfo s187-09 (TUG) Meteorite database 23178 Koordinaadid
(48° 29'N, 44° 49'E) Volgograd wiki 48.708611°, 44.514722°

Kogumise aeg 1854

(Collections of the Natural History Museum of the University of Tartu)

On the website <https://kivid.info/1810#gallery-2> photos of this fragment are posted.

TUG 1185-163

TUG 1185-163



Author: **Isakar, M.** / TŰ LM geoloogilised kogud

Date: **2023-01-10** Licence: **CC BY-SA 4.0**

The mineralogical department of the **National Museum of Stockholm** has a meteorite collection, which includes about 1,000 samples of 311 meteorites. Buchwald's reference book (1975) lists fragments of "Sarepta" weighing 80 g. The site contains 2 fragments of "Sarepta" (inv. No. LK7173 and No. 18650099, formerly LK0081), the weight is not specified on the site. In the database, the first fragment mistakenly indicates the year of discovery 1851.

In **Budapest**, the **Hungarian National Museum of Natural History** (Magyar Természettudományi Múzeum) has housed the collection of Prince Lobkowitz since 1869. The museum's collection developed from 1867 to 1918, since then the receipts have been minimal. In 1956, the museum suffered from a fire, during which half of the collection was destroyed. Currently, the museum houses 80 samples of 12 meteorites from the Carpathian region and the remains of other collections: 456 specimens from Baumhauer and 214 fragments from the von Braun collection. In the book of Wülfing (1897), as well as in the Buchwald handbook (1975), a fragment of "Sarepta" weighing 77 g is indicated. Confirmation of this could not be found at present.

The **Mineralogical Museum in the University Göttingen** (Georg-August-Universität Göttingen) houses one of the oldest collections of meteorites. It began in 1777, when the collection of Christoph Andreas Schluter from Hannover was presented to the Royal Academic Museum. After numerous receipts, the first catalog of meteorites was published in 1864. In the Wülfing's book (1897) and in the Buchwald handbook (1975) there are records that a fragment of "Sarepta" weighing 20 g is stored here. It has not been possible to confirm this at present.

The **Museum of Mineralogy and Geology Dresden**, which is a branch of the Society for the Study of Nature Senckenberg, has a meteorite collection. The history of the mineralogical collection of the museum dates back to the jewelry collection of the Elector in the XVI century and claims to be the oldest mineralogical collection. In the XX century, in the pre-war and post-war period, various studies were conducted in the

museum and the history of all collections was studied. In the Wülfig's book (1897) there is an entry that in Dresden there was a fragment of "Sarepta" weighing 90 g, and in Buchwald's handbook (1975) – 89 g. Since the beginning of the 1990s, work has begun on automated collection accounting, the result was the publication in 1997 of the first "Catalog of Meteorites in the State Mineralogy and Geology Museum Dresden", authored by Dr. Klaus Thalheim. An employee of the museum informed me about this is Dipl.-Geol. **Jana Wazeck**. The specified catalog describes 2 fragments of "Sarepta" and a splinter: 90.2 g in size 3.0 x 3.0 x 2.5 cm (inv. No. 522); 23.7 g in size 3.0 x 2.0 x 1.0 cm (inv. No. 18023); splinter 0.5 g.

According to Ms. J. Wazeck, there is information in old catalogs that the first fragment (inv. No. 522) was purchased on 22.05.1862 from Dr. Ludwig Wilhelm Schaufuss from Dresden. According to Wikipedia, Ludwig Wilhelm Schaufuß (1833-1890) is a German entomologist, like Heinrich Möshler, who received a third of the Sarepta meteorite for sale.

The second fragment (inv. No. 18023) came to the Dresden Museum in 1971 from the "Staatliches Museum für Naturkunde Görlitz". It is not known how this fragment got into the Görlitz Museum. There is no information about him in the catalogues of the late XIX century.



The Monica Grady's handbook (2000) reported on a fragment of "Sarepta" weighing 6 g in Mainz at the **Max Planck Institute for Chemistry** (Max-Planck-Institut für Chemie). The meteorite collection of Institute is located in the **Senckenberg Nature Museum in Frankfurt am Main**. The presence of the fragment "Sarepta" in this collection was confirmed to me by the head of the meteorite research section Dr. Jutta Zipfel.

In Mainz there was also a private collection of **Friedrich Paneth**, where there was a fragment of "Sarepta" 0.8 g, which was reported by M. Grady in 2000. After the owner's death, the collection was included in the meteorite collection of the Max Planck Cosmochemistry Department. In 2005, after the closure of this department, the

collection of meteorites was transferred to the British Museum, so a fragment of "Sarepta" weighing 0.8 g came to London. This was also reported to me by Dr. Zipfel.



*Friedrich Paneth
(1887-1958)*

The German scientist **Friedrich Adolf Paneth** was not only an outstanding chemist, but was interested in many sciences. His collection of meteorites originated in 1926, when Prof. Chernyak presented him with a fragment of 180 g of the "Mount Joy" meteorite. Friedrich Paneth collected meteorites all his life, there were more than 100 meteorites in his collection, and he also made up a large library on this topic. He developed a method for determining extremely small amounts of helium, which could make it possible to estimate the age of meteorites. The discovery of helium production by cosmic radiation in 1952 forced him to reconsider some of his conclusions. In 1929 he became a professor and director of the chemical laboratory at the

University of Königsberg. After Hitler came to power, F. Paneth moved to England. In 1953, he returned to Germany and became head of the chemistry department at the Max Planck Institute for Chemistry in Mainz. After his death in 1960, the F. A. Paneth Meteorite Foundation was established, which is administered by the Royal Astronomical Society, to support further research related to meteorites.

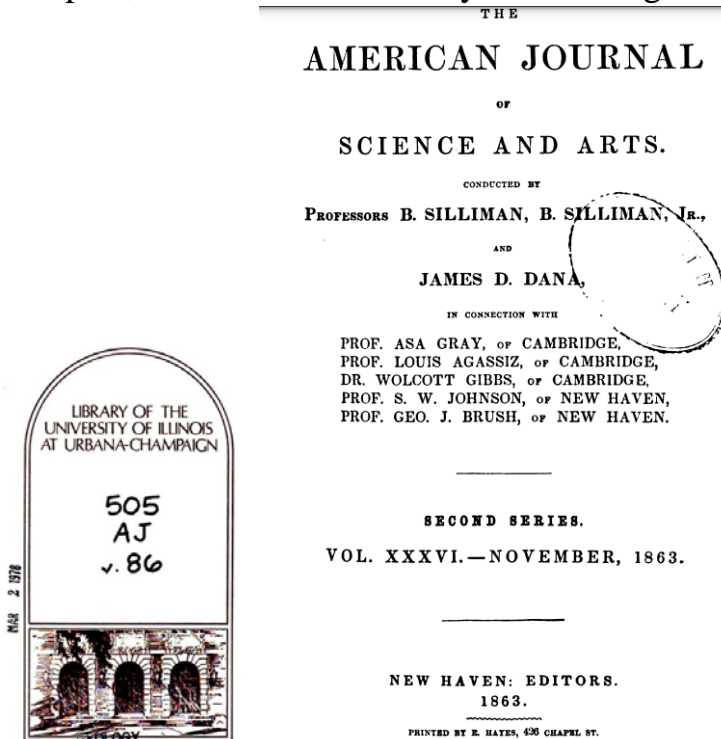
In the mineralogical Museum of the **University of Babes-Bolyai (UBB), Cluj-Napoca, Romania**, there is also a fragment of "Sarepta", obtained by them from the University of Berlin. The weight of the fragment is not specified on the UBB University website. In the Wülfing's book (1897) there is data on a small fragment weighing 2 g in Klausenburg, now it is the Romanian University in Cluj-Napoca.

There are currently no fragments of "Sarepta" in the meteorite laboratory of **the University of Utrecht in the Netherlands**, but in the Wülfing's book (1897) in the Mineralogical and Geological Institute of the university there was a fragment of "Sarepta" weighing 11 g.

In the Wülfing's book (1897) it is indicated that there were fragments of "Sarepta" in several private collections. These are the collections of: Professor **Dr. J. J. Pohl** in **Vienna** – a fragment weighing 120 g (in 1878 he published the first catalog of his collection); **James R. Gregory** in **London** – weighing 27 g; Professor, State Councilor **Baron von Braun** in **Vienna** – weighing 23 g; **Dr. Josef Melion** in **Brunn, Austria** – weighing 4 g; **V. Max Neumann** in **Graz, Austria** – weighing 4 g.

American and other collections

In the 1863 edition of the American Journal of Science and Arts, kept in the library of the University of Illinois, there is a message signed "F. A. Gtx": "Iron meteorite from Sarepta", in which the article by W. Haidinger of 1862 is retold.



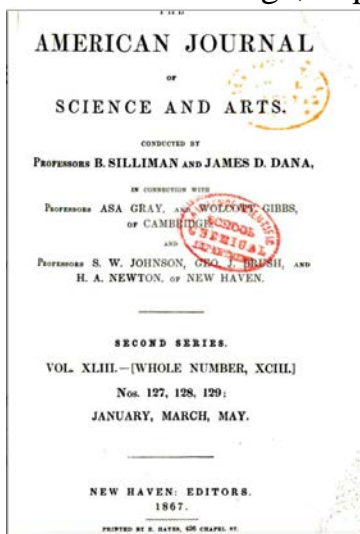
8. *The meteoric iron from Sarepta.*—Director Wm. Haidinger made at the meeting of July 24th, 1862, of the Imperial Academy of Vienna, some interesting observations on the meteoric iron from Sarepta. His paper is accompanied by two plates, one showing the peculiar appearance of the

Sarepta iron in three positions, the other representing prints from a galvanoplastic copperplate, prepared from the etched slices of Sarepta and Arva iron, showing their structure; together with two prints from the etched plates themselves.

Although it is very difficult to form without these illustrations a correct idea of the appearance and structure of this meteorite, we will give the following abstracts:

It was found in 1854 on the right bank of the river Volga in the steppes of the Kalmucs, 30 miles (German) from Sarepta in the district of Zarizin, Govt. Saratow in Russia. Its original weight was 32lbs. 58 zolotnik, = 31.58 lbs. avoirdupois or 14325 gra. The first notice of it was given at the meeting of Nov. 18th, 1854, of the Imp. Soc. of Naturalists of Moscow, by Dr. Auerbach, who exhibited it for Constantine Glitsch of Sarepta, at whose direction plaster casts were made of the mass, the original however being cut to pieces for distribution.

In the "American Journal of Science and Arts" of the 1867 edition, stored in the library of Harvard University, there is an article by **C. J. Sheppard** "A new classification of meteorites" with a list of meteor species. The "Sarepta" is also brought there. Published at Amherst College, September 29, 1866 (now the University of Massachusetts).



ORDER 5th. *Megagrammic.*

- | | |
|---|--|
| 1. Arva, Hungary. Found 1844. | 5. Cocke, (Sevier) Tenn., U. S. A. Found 1841. |
| 2. Sarepta , Russia. Found 1854. | 6. Heywood, N. Car., U.S.A. Found 1854. |
| 3. Zaccatécas, Mexico. Found 1792. | |
| 4. DeKalb, Tenn. Found 1845. | |

ART. IV.—*New Classification of Meteorites, with an Enumeration of Meteoric Species*; by CHARLES UPHAM SHEPARD.

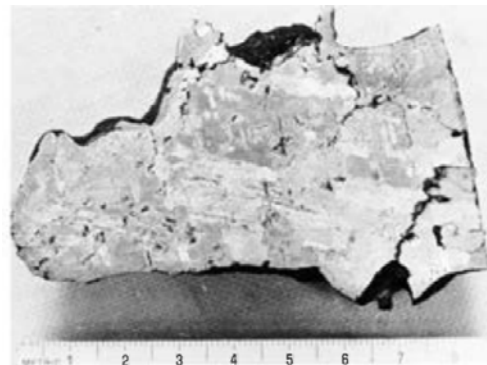


Marchand Wadsworth

In the book by **Marchand E. Wadsworth** "Lithological studies. Description and classification of the rocks of the Cordillera" (Cambridge, October 1884) there is a link to the co-communication of J. Auerbach on the meteorite "Sarepta" at the meeting of the Vienna Academy, 1864 (2), p. 497. Weight not specified, iron content 95.937%, nickel 2.657%, schreibersite (P Fe Ni) 1.315%.

In 1888, the collection of Harvard College, including the collection of J. Lawrence Smith, already included a fragment of "Sarepta" weighing 446.5 g. One side of it is polished, on which the lines of Widmanstaetten are clearly visible. This description is published in the article by **Oliver Whipple Huntington** "Catalog of all recorded meteorites, with a description of properties, in the collection of Harvard College", published in 1888.

446.5	<p>SAREPTA, Saratov, Russia.</p> <p>Iron. One face polished and etched, the rest of the surface showing a deeply pitted crust. The Widmanstättian figures are very striking, exhibiting very broad plates, most beautifully marked with Neumann lines, and interspersed with plates of brilliant nickeliferous iron, unequally distributed over the surface. Something like the Wichita iron. [<i>Smith Collection.</i>]</p>
-------	---



In the photo from the Buchwald's Handbook (1975): a fragment stored at Harvard.



On the website of the **Mineralogical and Geological Museum of Harvard University**, a photo of the fragment is shown and it is indicated that the total weight of the "Sarepta" is 14000 g, the weight of the fragment with the inventory number M16 is 425 g.

Photos from the website
<http://minecat.rc.fas.harvard.edu/objects/1404/>



Oliver Cummings Farrington

In August 1895, a "Handbook and Catalog of the Meteorite Collection" was published in Chicago, authored by **Oliver Cummings Farrington**, curator of the **Department of Geology at Columbia University**. In the section of the book "Copies of meteorites" there is a mention of the meteorite "Sarepta". "About 50 casts or copies of meteorites are presented, illustrating the size, shape and appearance of the original masses, of which some samples in cases formed part." No. 391. "Sarepta", Russia. This mention of our meteorite means that at Columbia University in 1895 there was one of the missing plaster copies of the whole meteorite "Sarepta", the first of which was made by Auerbach in 1854.

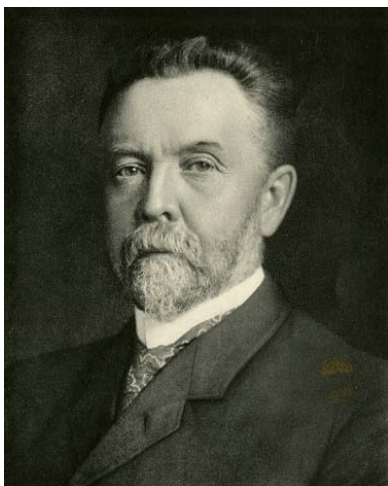
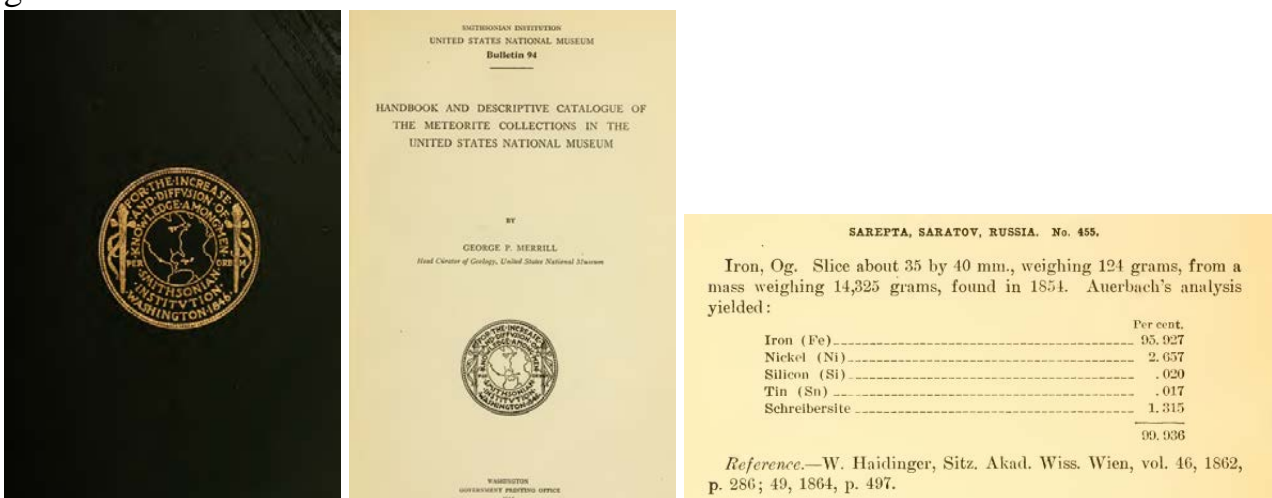
There is a **Field Museum of Natural History in Chicago**. The collection at the Robert A. Pritzker Center for Meteorites and Polar Research currently includes 1,791 meteorites and 13084 of their fragments. In the catalog published in 1995 ("Meteorites at the Field Museum"), a fragment of the meteorite "Sarepta" weighing 275.50 g was indicated. In the new 7th edition of the catalog, reissued on November 7, 2019, updated data: fragment 278.45 g (cut of the etched part) and 0.5 g (sawdust).

SAREPTA	ME 1145.1	IAB-MG	Found in 1854.	Volgograd Province,	278.45	Etched part slice
SAREPTA	ME 1145.2	IAB-MG	Found in 1854.	Volgograd Province,	0.5	Filings

In the **Smithsonian National Museum of Natural History in Washington**, the Department of Mineral Sciences has 61380 items in the meteorite collection. *"This is one of the largest and most complete collections in the world. The modern meteorite*

collection includes more than 45,000 samples of more than 16,850 different meteorites, including almost 10,000 polished thin slices. Although the collection contains examples of all types of meteorites, it is especially rich in iron meteorites and includes 9 of the slightly more than 50 known Martian meteorites." It contains 7 fragments of the meteorite "Sarepta": No. 3054 – 101.49 g; No. 455 – 92.57 g; No. 455 – 18.33 g; No. 1134 – 4.59 g; No. 1134 – 3.13 g; No. 3370 – 2.73 g; No. 3053 -19 g (polished part). Total 241.84 g.

In 1916, **George Merrill's** "Handbook and Determinant-Catalog of the Meteorite Collection at the National Museum of the USA" was published. It contains a fragment of "Sarepta" inv. No. 455 weighing 124 g. It is obvious that this fragment was broken into parts, 92.57 and 18.33 remained – together 110.9 g. Another piece of 13.1 g has gone somewhere.



*George Perkins Merrill
(1854-1929)*

George Perkins Merrill, geologist and chief curator of the Geology Department of the U.S. National Museum (Smithsonian Institution) from 1917 to 1929. In 1922, he was elected a full member of the U.S. Academy of Sciences. He has published many articles on meteoritics.

In New York in June 1897, a catalog of the private collection of meteorites by **Stratford C. Harvey (S.C.H.) Bailey**, who lived in Fort-on-Hudson (New York), was published. His collection originated in 1872, 2 years later there were already 8 meteorites in it. It was exhibited in the old Arsenal building in New York at the corner of 64th Street and 5th Avenue. S. Bailey published his notes on the study of meteorites

in 1893. In his collection there was a fragment of "Sarepta" weighing 5 g. In the Wülfing's book (1897), this fragment of 5 g is mentioned.

There was another collector in **New York, Clarence Sweet Bement** (1843-1923), who lived in Philadelphia. He began collecting meteorites in the 1880s, often buying and exchanging them with the famous mineral expert George Frederick Kunz (1845-1932). Wülfing's book (1897) mentions a fragment of "Sarepta" in his collection weighing 8 g.

In **New York, Manhattan** is home to **the American Museum of Natural History**. In the Wülfing's book (1897) there is no mention of "Sarepta" in this museum. In 1937, the "Catalog of the American Museum of Natural History" by **Chester Reeds** was published. According to the author, the nomenclature corresponds to the Prior edition of 1923. In the Reeds catalog there is a fragment of "Sarepta" weighing 94.5 g. The history of the museum's meteorite collection began in 1872. In 1874, the museum acquired the first collection of S.C.H. Bailey, in which there were 8 meteorites. In 1896, the first catalog of meteorites of the museum was published, which was prepared by the curator of the museum E. O. Hovey. In 1900, the museum received a large collection of Bement, in which there were about 580 fragments of 500 meteorites. In 1909, huge iron meteorites arrived from Cape York from Greenland, found in 1897 by Robert Peary. In 1905, the museum received the collection of Dr. Kunz, it contained 186 fragments. In 1906, the Willamette iron meteorite weighing 15.5 tons was presented to the museum. This is the largest meteorite found in America. In 1912, the entire S.C.H. Bailey collection was acquired, which contained unique samples and which gave many fragments for exchange. In 1913, 32 more copies were received. A notable exhibition was in 1914 from the Princeton University collection of D. M. Barringer. In the following years, the collection was constantly replenished with new finds and became one of the most significant in the world. On October 1, 1935, it included 3,744 fragments of 548 meteorites.

Article VI.—CATALOGUE
OF THE
METEORITES
IN
THE AMERICAN MUSEUM OF NATURAL HISTORY
AS OF OCTOBER 1, 1935
BY CHESTER A. REEDS, PH.D.

Sarepta, Saratov, U. S. S. R.
Found: 1854
Siderite: Coarse octahedrite, Og.
Specimen: (197) 94.5 gms.
Remarks: A mass of about 14 kg. was found on the right bank of the Volga,
20 miles from Sarepta.

Currently, this collection consists of 5000 fragments of 1255 meteorites. 155 of them are on display in the **Arthur Ross Meteorite Hall**. In the list of meteorites on the museum's website as of March 2002, "Sarepta" is indicated, but without specifying the weight of the fragment.

SAREPTA IR IA RUSSIA FIND 1854 (перевод с английского: САРЕПТА, тип IR, класс IA, Россия, находка 1854 г.)
--

Chester Albert Reed was born in 1882. Professor at the University of Oklahoma, since 1912 in the system of the American Museum of Natural History (assistant curator 1912-1917, associate curator 1917-1927, curator since 1927). In 1912, he catalogued the Stratford C. Harvey Bailey collection during its transportation to the museum. Starting in 1916, he acquired many meteorites for the museum. He died in 1968.



*Harvey Harlow Nininger
(1887-1986)*

There were legendary personalities in the history of meteoritics. One of them, with no doubts, is **Harvey Harlow Nininger**. He was called the main meteorite hunter. He wrote more than 140 articles and 10 books about meteorites: "A Comet strikes the Earth" (1942), "Chips from the Moon" (1947), "Out of the Sky" (1952), "Meteor Crater of Arizona" (1956), "Ask a question about meteorites" (1962), "Find a Falling Star" (1973) and others. Harvey Nininger and his brother Addi created their meteorite museum in 1946 in Arizona, not far from the famous meteorite crater. In 1950, a catalog of his

collection was published, in which there was a fragment of "Sarepta" (inv. No. 546.1) weighing 4.5 g.

Nininger sold his meteorite collection: one part to the British Museum of Natural History for \$ 140.000 in 1958, the other to the University of Arizona in 1960. After the sale, he began to travel to the places where meteorites fell, studying the craters from them.

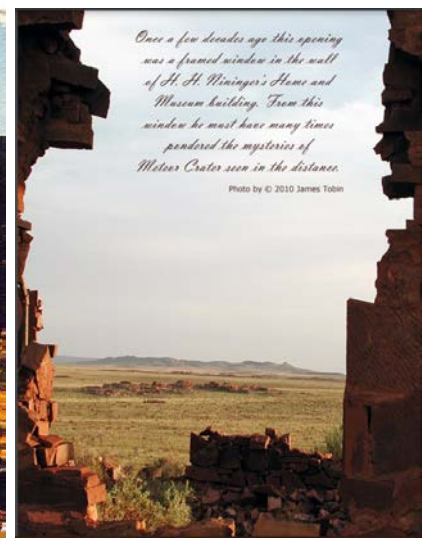


Photo 1. Museum of H. Nininger (1952). At the house there is a sign: "The new home of the world-famous Nininger meteorite collection". Photo 2. View from the destroyed window of the Nininger Museum (magazine cover "Meteorite Time Magazin").

The **Meteorite Research Center at Arizona State University** (Tempe) has been headed by Dr. Carlton B. Moore since 1961. He contributed to the growth of the collection, and soon it became the third in the world – after the British Museum and the Smithsonian Collection.

In 1964, the "Catalog of Meteorites in the Collection of the University of Arizona" was published under the editorship of Dr. Carlton Moore.

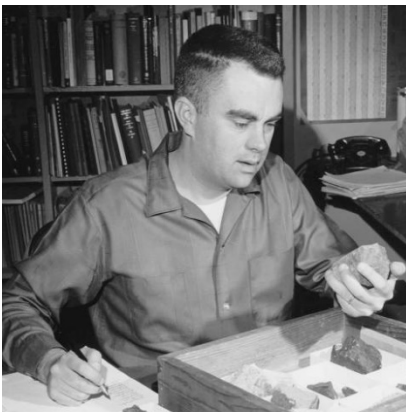
CATALOG OF METEORITES

in the collections of

ARIZONA STATE UNIVERSITY

Tempe, Arizona
1964

It repeated the information from the Nininger's catalog. A fragment of the "Sarepta" weighing 4.5 g. Currently, the meteorite collection is called the "**Carlton Moore Collection**".



Carlton Moore

Moore, in complete isolation for several years, examined samples brought from the Moon by the Apollo 11, 12, 13 and 14 spacecraft.

The meteorite collection of the **Massachusetts College** (Amherst) was initiated by one of the largest Sheppard collections at the end of the XIX century. The Buchwald's Handbook (1975) in Amherst listed fragment 203 g. In 1978, the meteorite collection of Massachusetts College was transferred to the **Meteorite Research Center at Arizona State University**.

In the "Carlton Moore Collection" there is a fragment of "Sarepta" No. 546 weighing 207.4 g. But it looks like the total weight: 203 g and 4.5 g = 207.5 g.

Meteorite Name	ASU Number	Location	Type	Class	Current ASU weight
Sarepta	546	Volgogradskaya oblast', Russia	Iron	IAB-MG	207.4

Monica Grady's Handbook (2000) reported on a fragment of "Sarepta" in Palatine (a suburb of Chicago), Illinois weighing 16 g in the collection of J. Dupont. For thirty years, **Jim DuPont** has collected an impressive collection, it contained 1719 individual meteorites with a total mass of more than 500 kilograms, which made it the largest personal collection in the world.

At the end of 1995, the Planetary Studies Foundation received most of Jim DuPont's meteorite collection from his widow and began to exhibit it at the **American Rocket and Space Center in Huntsville**, Alabama, as well as in several museums in Chicago. In the end, the Planetary Research Foundation decided to transfer the entire collection, according to one source, to the **Yale Peabody Museum of Natural History in New Haven, Connecticut**; according to other sources, to the Field Museum of Natural History in Chicago. This collection was estimated at \$3 million. The Yale collection was further expanded by new meteorites coming from Northwest Africa and other parts of the world, including interesting samples from the Moon and Mars. We have described the Fields collection above. However, in both collections there is no information about the fragment of "Sarepta" weighing 16 g.

American collector **James Madame DuPont** (1912-1991) was the founder and chairman of Thermoplastics Inc., a plastics manufacturer. He created the world's largest private collection of meteorites, consisting of more than 1,700 meteorites.



*Charles Sheppard
(1804-1886)*

The collection of Professor **Charles Sheppard** of the second half of the XIX century was one of the best in the USA. In 1886, it contained a fragment of a "Sa-repta" weighing 3.3 g. This collection continued to be replenished by his son, Dr. Charles J. Shepard (died in 1915). In the Wülfing's book (1897) there is a fragment weighing 3 g indicating that it is from the former collection of Sheppard, which was received at the National Museum in Washington.

In the Wülfing's book (1897) in the collection of **Adelbert College, Cleveland, Ohio**, a fragment of "Sarepta" weighing 4 g is indicated. In total, 7 meteorites with a total weight of 143 g are listed in the collection. In 1967, the amalgamation of Adelbert College and the Case Institute of Technology into Case Western Reserve University (abbreviated CWRU). In the 2000s, he implemented a NASA grant to study meteorites in Antarctica. There is no data on the presence of a collection of meteorites in CWRU.

In the catalog of the Geological and Natural History Museum of the **University of Minnesota**, USA, issued in 1892, there is a description of a fragment of the meteorite "Sarepta" weighing 2.5 g, exchanged with Prof. C. J. Sheppard.

**CATALOGUE OF THE METEORITES IN THE UNIVER-
SITY COLLECTION, WITH REFERENCES TO
LITERATURE DESCRIBING THEM.**

No. 26. **Sarepta**, Saratov, Russia. Found in 1854. Museum number, 4413.

J. Auerbach; Sitz. Wien Akad., 1864, xlix, [2], p. 497.

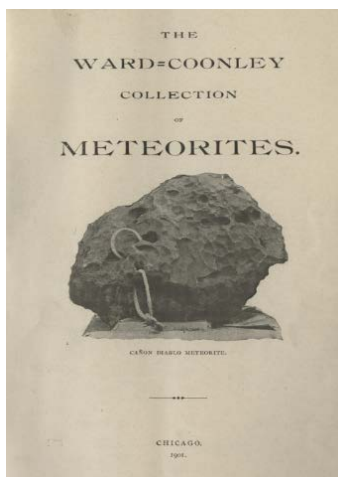
Iron. Cuttings. Weight, 2.5 grams.

[By exchange with Prof. C. U. Shepard.]

Ward's Natural Science Establishment

ROCHESTER, N. Y., UNITED STATES OF AMERICA,

I found in the internet many advertising brochures of the firm **Ward's Natural Science Establishment** at the end of the XIX – the beginning of the XX century. In the WARD-COONLEY meteorite catalogues published in 1901, there is a fragment of "Sarepta" with a weight of 36 g. In the price lists for October 1, 1897 – fragments of the network; June 1, 1899 – a fragment with a weight of 8 g for \$7,50; January 5, 1901 – a fragment with a weight of 8 g for \$5; June 1907 – 2 fragments weighing 4 g for \$2.50 and 102 g for \$30; August 1914 – a fragment weighing 124 g for \$37.50.



Ward's Natural Science Establishment
ROCHESTER, N. Y., UNITED STATES OF AMERICA.
May 1st, 1901.

METEORITES FOR SALE.

N. B.—It will be noticed that there is not always consistency in the prices of different specimens of a meteorite as related to their weights. This is because of other considerations [shape, etc.] which often affect value. In giving weights, no attention is given to fractions of a gramme for those weighing more than five grammes.

SIDERITES.

SECTION OF THE ABOVE METEORITE, AND OTHER NATURAL BARS.

NAME.	WEIGHT.	PRICE.
Arlington, St. Louis County, Minn.	15 grammes.	\$7.00
" "	22 "	12.00
" "	44 "	18.00
" "	56 "	22.00
" "	101 "	35.00
" "	152 "	110.00
Augustinowka, Ekaterinowsky, Russia.	95 "	3.00

Ward's Natural Science Establishment
76-104 COLLEGE AVENUE
Rochester, N. Y., United States of America
JUNE, 1907

Meteorites For Sale

Williams Meteorite, lower side.

Since the last edition of this price list was published there have been very extensive changes in our stock of meteorites. Special attention is called to the new falls represented, including Cross Butte, Elm Creek, Estancia, Hodge, and Hodge, and to those which hitherto have not been on the general market, such as Billings, Santa Rosa, and Williamsite. Practically all of the specimens of the rare siderites that we have in stock are mentioned in this list, but in the case of the more common ones, such as Canyon Diablo, Toluca, Rose County, Pallas, etc., quantities are given on but a small portion of the specimens we have, and prices on other weights than those listed will be furnished on application. Collections of typical, but inexpensive meteorites are described in a special circular which will be sent on application.

Price List No. 74

PRICE LIST OF METEORITES

FOR SALE BY
WARD'S NATURAL SCIENCE ESTABLISHMENT
64-102 College Avenue, Rochester, N. Y.
AUGUST, 1914

An advertising leaflet sent by Ursula Muller-Krantz from Ward's Natural Science Establishment, issued on June 1, 1899, contains an offer to purchase two fragments of the "Sarepta" from this company: 8 g, price \$7.5, and 2.5 g, price \$4.5. The further fate of these fragments is unknown.

METEORITES FOR SALE.

*Russische Meteoriten portretten bei Tiernaschko
in geringeren Mengen:*

1840 Petropaw-Lowsk, Mass. fl. Gouv. Touk: g 14.
1846 Netschaevo, Alexia, Gouv. Toula: g. 136; 13,5 e 3.
1854 Sarepta, Gouv. Saratow: g. 2,5 e 4,5



*Henry Augustus Ward
(1834-1906)*

Founded in 1862 by **Henry Augustus Ward**, Ward's Natural Science Establishment was a leading supplier of natural materials to museums in North America. Henry Ward traveled extensively around the world, and his cousin Frank Ward became treasurer of the company in 1884, whose main office was in Rochester.



A.L. Coulson

The **Indian Museum, Kolkata** has a meteorite collection, which was founded in 1940 by A. L. Coulson. Priority is given to all meteorites found in India. The order of the Government for British India stated that *"all meteorites falling in British India are the property of the Government of India and as such, as a rule, should be in the Indian Museum under the care of the Geological Service."* In the Wülfing's book (1897) it is stated that there are fragments weighing 177 g in Calcutta. In the Buchwald's handbook (1975) it is recorded that there is a fragment of "Sarepta" weighing 60 g in Calcutta. On the website of the Indian Museum is specified a fragment weighing 60.5 g.

Summary

Let's summarize the information found **about the known fragments of the “Sarepta”** (in grams). (**G.** – from Grady's handbook; **B.** – from Buchwald's handbook; **W.** – from Wülfing's book).

<i>Location of fragments (from what year)</i>	2023	2000 G.	1975 B.	1897 W.
Berlin, Museum für Naturkunde	1858,9	2 kg	1,96 kg	1962
Moscow, Committee on Meteorites of the RAS Fersman Mineralogical Museum GEOKHI RAS (1862)	1259,7= 500,5 230,5 528,7	1,25 kg	739	252
Paris, National Museum of Natural History	158,5 4,8 47,9 73,1 40,3 0,653 665,5	1 kg	973	329
Vienna, Natural History Museum (1862)	393,61 357,13	0,75 kg	751	751
Stuttgart, State Museum of Natural History			632	632
Würzburg, Mineralogy and Geology Institute in the Julius-Maximilians-Universität (1862)			488	488
Harvard, University (1888)	425	427	446	446
Chicago, Field Museum of Natural History	278,45 0,5 sd.	275	286	
London, Natural History Museum (1985) (2005, collection F. Paneth)	223 60,5 36 0,8	319,5	283	296 36
Washington, Smithsonian National Museum of Natural History	101,49 92,57 18,33 4,59 3,13 2,73 19	217	253	
Tempe, the Carlton Moore Collection, Arizona State University. In 1978 – from Amherst, Massachusetts University	207,4	207	203	
Tübingen, Eberhard Karls Universität (collection von Reichenbach, 1869)	157,5	339	336	247
Strasbourg, University	1 frg.		119	
New York, American Museum of Natural History	1 frg.	94	95	(1937: 94,5)
Dresden, Senckenberg Museum of Mineralogy and Geology	90,2 23,7 0,5 sd.		89	90
Stockholm, National Museum	2 frg.		80	80

Budapest, Hungarian National Museum of Natural History			77	254
Cambridge, Hudson Institute of Mineralogy (formerly Erlangen University, Nuremberg)	75,7			104
Kolkata, Indian Museum	60,5	60	60	177
Bonn, University	2,8 44,2		4997	3
Tartu, University (formerly Dorpat, 1882)	41		41	41
St. Petersburg, Mining University	21,61		21	44
Göttingen, University (Georg-August-Universität Göttingen)			20	20
Vatican, Observatory (1905) (1913 – 1927)	8,2 4,8	12,5		
Frankfurt, the Senckenberg Nature Museum (Max Planck Institute for Chemistry)	6	6		
St. Petersburg State University	1,20 1,80 2 sd.			
Minneapolis University	2,5			2
Cluj-Napoca, Babes-Bolyai University (Romania) (formerly Klausenburg)	1 frg.			2
A total of 44 fragments were found in 2023, as well as: 5 fragments (weight, possibly 295 g); unconfirmed (4 cities)	6877,79 1216	6756,8	7841	6256

sd. – sawdust. *Crossed out* – erroneously given in different sources.

The fate of the fragments of "Sarepta" has **not been clarified** (the first fragments, private collections, trading companies):

Moscow, Petrovskaya Agricultural Academy (Auerbach, 1862, 1865, Trautschold, 1868 – 558.8 g; 41 g; 1878 – 302 g; 82 g; 1897 – 72 g); **Glitsch** (Sarepta, 1862 – 665.0 g; 669.4 g; 177.2); **von Haidinger** (Vienna, 1862 – 306.3 g; 446.3 g); **Krantz** (Bonn, 1862 – 250 g); **Greg** (Manchester, 1862 – 82 g; 24.1 g); **Neumann** (Graz, 1897 – 4 g); **Petersburg, Mining Institute** (1897 – 44 g); **Dr. Pohl** (Vienna, 1897 – 120 g); **Gregory** (London, 1897 – 27 g); **Baron von Braun** (Vienna, 1897 – 23 g); **Jim DuPont** (Palatine, Illinois, 2000 – 16 g); **Utrecht** (1897 – 11 g); **Bement** (1897 – 8 g); **Simashko** (1891-1897 – 2.5 g; 4.5 d); **Bailey** (1897 – 5 g); **Nininger** (1950 – 4.5 g); **Cleveland** (1897 – 4 g); **Melion** (1897 – 4 g); **Sheppard** (Washington, 1897 – 3 g); **Ward** (New York, 1899 – 8 g; 2.5 g; 1907 – 4 g; 102 g; 1914 – 124 g); **Vienna, Museum** (A. Brezina, 1902 – 19 g); **Neuman K. T.** (Prague, 1862) – 1.57 g. Only 34 copies. It is quite possible that they are taken into account in our table by the new owners.

Let's summarize the results of our searches and reflections.

The Sarepta meteorite was found 30 versts south of the Sarepta colony in 1854. He got to the Sarepta collector, the owner of the mustard factory Konstantin Glitsch. In the same 1854, the famous scientist Johann Auerbach visited him, who conducted a chemical analysis of the meteorite found, and also made a plaster cast of it. Auerbach suggested cutting out several fragments and sending them to scientific centers in Europe, including the Academy of Sciences in St. Petersburg. He himself also received 2 fragments weighing 558.8 g and 41 g. At that time, J. Auerbach was the curator of the mineralogical lectures of Moscow University, and since 1865 - the Petrovskaya Academy of Agricultural and Forestry. After Auerbach's death in 1867, his student Hermann Trautschold compiled a list of meteorites stored in the museum of the Petrovskaya Academy the following year. Among them was a fragment of "Sarepta" weighing 558 g. In the published catalog in 1878, 2 fragments weighing 302 g and 82 g were already stored at the academy. In the Wülfing's book in 1897, it is indicated that there is one fragment weighing 72 g in the Academy. Already in 1898, there was no "Sarepta" in the list of meteorites stored in the Academy's museum.

What have we found out?

A plaster cast of the whole meteorite used to be in the Petrovskaya Academy of Agricultural and Forestry (now the Moscow Timiryazev Agricultural Academy), in 1878 4 plaster models of "Sarepta" were already stored there. Perhaps in 1895 one of them was already in the collection of Columbia University in the USA. Currently, nothing is known about these Sarepta models. Many fragments of the meteorite are in museums and universities in Europe and the USA, as J. Auerbach wanted.

In the book by E. Wülfing, published in 1897, 33 collections were named, in which fragments of "Sarepta" were stored. If the meteorite found weighed 13,352 kg, then the "confirmed weight" (the total weight of the known fragments) was 6,517 kg.

In "Handbook of Iron Meteorites" by V. Buchwald, published in 1975, there is also a description of the distribution of fragments of "Sarepta" to different scientific centers. There are no private collections left, small fragments are not specified. A total of 22 research centers were named, the total "confirmed weight" was 7,026 kg.

The reference book by M. Grady, published in 2000, describes 16 collections in which fragments of "Sarepta" are stored. The "confirmed weight" of all is 6747 g.

The **total weight of 44 known fragments is 6877 g** and the weight of five more fragments could not be found out (possibly 295 g). Unconfirmed collections in 4 cities: Stuttgart (632 g), Würzburg (488 g), Budapest (77 g), Göttingen (20 g) store fragments of our meteorite with an approximate weight of 1306 g.

I have also collected information about the fragments of "Sarepta", the fate of which is unknown. It is quite possible that all these unknown fragments are taken into account in our table by the new owners.

- 1) A. Brezina's reference book "Collection of meteorites" of 1904 mentions a fragment of the meteorite "Sarepta", stored in the Nature Museum of Vienna, weighing 19 g.
 - 2) Fragments from the Auerbach collection: weighing 558.8 g was in the Petrovsky Academy in 1865, but in 1898 it was no longer there; as well as another weighing 41 g;
 - 3) Konstantin Glitsch had 3 fragments (665.0 g; 669.4 g; 177.2 g);
 - 4) Wilhelm von Haidinger also had 2 fragments (306.3 g; 446.3 g).
 - 5) Konstantin Glitsch sent a fragment to the firm of Dr. Krantz in Bonn (250 g), but he has not been there for a long time;
 - 6) to Manchester, Robert P. Greg – 2 fragments (82 g; 24.1 g);
 - 7) to Prague, Mr. Neuman K. A. (1.57 g);
 - 8) in the Jim DuPont Collection (Palatine, Illinois) – 16, the collection was sold to the Planetary Research Foundation, which then transferred it to Yale University or the Field Museum in Chicago;
 - 9) In New York, in Ward's trading company in 1899, 2 small fragments (8 g; 2.5 g) were put up for sale. in 1907, the other 2 fragments: 4 g; 102 g; in 1914, 124 g.
- There are 34 copies in total, their total weight is 3,892 kg.

We must not forget that the third part of the "Sarepta" weighing more than 4 kilograms in 1862 was sold to the mineral dealer Möshler, who had to divide it further and sell it off.

It is necessary to take note of what was initially recognized: all fragments can be used for research, therefore, they can be crushed or exchanged to other scientific centers.

In conclusion, I will quote from the book by **M. Dyakonova, V. Kharitonova, A. Yavnel "Chemical composition of meteorites"** indicators of the meteorite "Sarepta": Type IA. **Fe 92.50%, Ni 7.80%, Co 0.43%, Cu 0.02%, P 0.17%**. (author of the analysis is **John Wasson**, 1974). Similar indicators in the handbook of **V. Buchwald (1975)**: Group I. **Ni 6.82%; Co 0.43%; P 0.17%; Ga 100×10^{-6} ; Ge 457×10^{-6} ; 3.4 $\times 10^{-6}$.**

This differs from the results of J. Auerbach: **Fe 95.9%, Ni 2.7%, schreibersite 1.3%, Sn 0.017%, SiO₂ 0.020%**.

All the differences are explained by the different level of available tools and methods of chemical research.

In terrestrial iron compounds, the nickel content is found no more than 3%, in the presented fragments of the meteorite "Sarepta" - almost 7%, which once again proves its cosmic origin.

The prospects

In the end, we are overwhelmed with the desire to find out the place of the fall of the Sarepta meteorite. If in 1853 Konstantin Glitsch excavated the Sarmatian mound in the floodplain of the Donskaya Tsaritsa River, and in the first half of 1854 he became the owner of an iron meteorite weighing almost 13.5 kilograms, immediately named "Sarepta", it suggests that the meteorite was found near the excavation site. Together with Evgeny Konopatov, a great connoisseur of our places and a lover of history, we made an arc at a distance of 30 versts from Sarepta: from the farm Trudolyubiye through the village Lugovoy to the village Severny (the former Kalmyk village Zoety on the bank of the Donskaya Tsaritsa). However, in the message of N. Barbot de Marni *"In one place of the lowland steppe, between Sarepta and Tundutova ..."* it is necessary to look for a Tundutova [village]. In the book "K. M. Baer's Caspian expedition in 1853-1857" there is a description of the scientist's trip in early May 1856 (290 p.) to the south, with a stop for the night in the Tundutova village, south of Lake Barmantsak. This direction coincides with the assumption of Sergei Monikov. Thus, Barbot de Marni had in mind the low-lying steppe on the Sarepta - Barmantsak line, 30 kilometers from Sarepta, as the place of discovery. This is probably the vicinity of the farm Trudolyubiye or the Shchuchiy estuary and its low-lying places, in front of the village Zaza. Evgeny Konopatov suggested that the meteorite could have been found closer to the road. Considering that all these places are associated with the fighting during the Stalingrad Battle, I asked the military searchers if they had met "iron" stones at the battlefields? Alexey Babichev and Anatoly Navodkin answered in the same way that they may have met, but they most likely threw them away, taking them for war-melted metal.

Practice shows that there is no "meteor fever" in our case, because the location of the "Sarepta" is uncertain, enough time has passed. But the saddest thing is that the Stalingrad Battle raged in these places, and the earth is stuffed with "military" metal. But if a new find happens, and it will be similar in composition to our meteorite "Sarepta", it will give food for deep thought and, perhaps, new expeditions.

Searching for materials about meteorites in libraries and museums gave me real pleasure. Libraries of Volgograd State and of State Socio-Pedagogical Universities, Volgograd Gorkiy Regional Library, the German library of the museum-reserve "Old Sarepta", the library of the Moscow Society of Naturalists, the Russian State Library ("Leninka"). Visits to various museums where there are meteorite collections gave me great food for thought. This is the Fersman Mineralogical Museum, the Vernadsky State Geological Museum, Vernadsky Institute of Geochemistry and Analytical Chemistry (GEOKHI RAS), Auerbach Geological and Mineralogical Museum of the Moscow Timiryazev Agricultural Academy, Moscow and Volgograd Planetariums.

I am grateful for the support and assistance in the preparation of this material from Viktor Medvedev, Sergey Monikov, Evgeny Konopatov, Julia Smirnova, Andrey Zakharov, Zoya Bessudnova, Anna Skripnik, Sergey Grishin, Mikhail Vinnik, Olga Topchina, Svetlana Ryzhkova, Galina Barkhudarova, Dmitry Kazakov, Sergey Kolisnichenko, as well as all foreign colleagues who answered my questions: Ludovic Ferriere (Vienna), Clemens Wachter, Udo Andraschke (Nuremberg), Leho Ainsaar (Tartu), Ansgar Greshake (Berlin), Ursula Müller-Krantz (Bonn), Anne Zacke (Bonn), David Gelsthorp (Manchester), Robert Macke (Vatican), Frank Usbek (Herrnhut), Matthieu Gounelle (Paris), Jutta Zipfel (Frankfurt), Jana Wazek (Dresden).

One last thought. Adolf Goebel's quote from the above article of 1868 remains in my memory. *"Until 1861, only 25 meteoric falls were known in European Russia, including Finland and Poland, while in Italy, Germany, Austria, Holland, Belgium, France and Great Britain there were up to 178. It would be inappropriate to analyze the causes of this circumstance here. We can only note that the non-correlation of the number of falls in Russia and abroad is not exclusively conditioned by the population density, and that it should change with the development of curiosity, attention and interest in these subjects on the part of our urban and rural population, since it should be assumed that on equal areas of land falls almost the same number of aerolites, of which only the smallest part falls into human hands..."*. Continuing this thought, I would like to hope that this book will serve just the development of *"curiosity, attention and interest"* to space aliens - aerolites or meteorites.

Alexander Smirnov
Volgograd, Sarepta

P.S. All searches and correspondence were conducted in 2023.

Literature, sources

1. Anastasenko, G. F., Krivovichev, V. G. "In the halls of the mineralogical Museum of St. Petersburg State University". // Moscow: Mineralogical Almanac, 2011 r. 256 pp.
2. Askochenskaya, A. "Time to collect stones".
<https://www.ras.ru/digest/showdnews.aspx?language=ru&id=9aa7cc69-dbb4-47ab-acdf-0e8480773032>
3. Astapovitch, I. S. A list of the meteorites of the Soviet Union. (All authentic Soviet Union meteorites recognized up to Jan. 1, 1938). // Meteor News. The Royal Astronomical Society of Canada. P. 196.
4. Bailey meteorite collection checklist (June 1897). P. 7. <https://wardproject.org/viewer/16311>
5. Barbot de Marni, N. P. "A geological and orographic sketch of the Kalmyk steppe and the lands adjacent to it" // Zap. IRGO. SPb., 1862. Book 3. pp. 71-72.
6. Basargina, E. Y. Mineralogical – Geological – Geological and Mineralogical Museum named after Peter the Great. <http://ranar.spb.ru/rus/books6/id/594/print/>
7. Bessudnova, Z. A. "Geological research at the Museum of Natural History of Moscow University, 1759-1930". Moscow: Nauka, 2006. – 246 pp.

8. Brezina, A. «The Arrangement of Collections of Meteorites». // American Philosophical Society, Apr. 1904, vol. 43, № 176, p. 221.
9. Buchwald, Vagn F. Handbook of Iron Meteorites. University of California Press, 1975. - 1426 pp.
10. Casts of meteorites for sale by Ward's Natural Science Establishment. 1899. P. 5. <https://wardproject.org/viewer/915>
11. Casts of meteorites for sale by Ward's Natural Science Establishment. 1901. P. 5. <https://wardproject.org/viewer/16132>
12. Catalogue of the meteorite collection by Yul. I. Simashko. // Notes of the Imperial St. Petersburg Mineralogical Society, 2nd series, part 28. St. Petersburg: A. Yakobson Printing House, 1891. pp. 213-276.
13. Catalogue of the meteorites in the University collection, with references to literature describing them. P. 176. // Annual report – Geological and Natural History Survey of Minnesota. 1892.
14. Chernenko, V. V., Andreeva, I. P., Samsonova N. N. "Vladimir Ivanovich Vernadsky and the collection of the Mineralogical cabinet of the Imperial Moscow University." pp. 107-108. // "Science and enlightenment. Dedicated to the 150th anniversary of the birth of Academician V. I. Vernadsky." Collection of scientific articles of the Russian Academy of Sciences. Yekaterinburg: UIPC LLC, 2012. – 356 p.
15. Chklarevski, A. Etat des Meteorites, conserves au Musee Mineralogique de l'Unaversite de Moskou (1898). // Annu. Geol. et Miner. Russie. 1898-1899. Vol. 8. P. 22-23.
16. Chukhrova, N., Komizerko, K. "Meteorites of the collection of the Geological and mineralogical Museum of the Moscow Agricultural Academy named after K. A. Timiryazev" // "Meteoritika", issue 12. Committee on Meteorites of the USSR Academy of Sciences, 1955. pp. 106-111.
17. Goebel, A. F. "On aerolites in Russia". 4 articles by A. F. Goebel. Appendix to Volume XII of the Notes of the Imp. Academy of Sciences. St. Petersburg, 1868.
18. Dyakonova, M. V., Kharitonova, V. Ya., Yavnel, A. A. Chemical composition of meteorites. Moscow: Nauka, 1979.
19. Emeleus, H. J. Friedrich Adolf Paneth. Biographical Memoirs. // Biographical memoirs of fellows of the Royal society, 1960, vol. 6, pp. 227-247.
20. Grady, M. M. "Catalogue of Meteorites" Reference Book with CD-ROM. 5th edition, London, 2000. – 696 p.
21. Grady, M. M., Pratesi, G., Cecchi, V. M. "Atlas of Meteorites". Cambridge, University Press, 2014. – 374 p.
22. Greg, R. P. «A Catalogue of Meteorites and Fireballs, from A.D. 2 to A.D». London: John Murray, 1861.
23. Grewingk, C. «Verzeichnis der Meteoriten-Sammlung der Universität Dorpat im Dezember 1882». // Archiv für die Naturkunde Liv-, Ehst- und Kurlands, 1882, volume 9, S.153-160.
24. Gth. F. A. «The meteoric iron from Sarepta». // American Journal of Science and Arts. 2. Series. Vol. XXXVI. November 1863. New Heaven Editors, 1863, pp. 150-152.
25. Farrington, O. C. Handbook and catalogue of the meteorite collection. Chicago, 1895.
26. Feldman, V. I., Bessudnova, Z. A. "Meteorites in the collection of the V. I. Vernadsky State Geological and Mineralogical Museum" // "VM-Novitates. News from the V.I.Vernadsky Geological Museum" No. 15, 2010.
27. Fletcher, L. An introduction to the study of meteorites, with a list of the meteorites represented in the collection. London, 1908.
28. Haidinger, M. W. "Das Meteoreisen von Sarepta" // Sitzungsberichte Kaiserlichen Akademie der Wissenschaften. Wien. XXI. Sitzung von 24. Juli 1862. XXVI. Band. 2. Abteilung. S. 286-298.
29. Howard, K. S. The Rochester collection of meteorites. Descriptive list of samples. Rochester, 1909. P. 12.
30. Huntington, O. W. Catalogue of all recorded meteorites, with a description of the specimens in the Harvard college collection, including the cabinet of the late J. Lawrence Smith. // *Proceedings of the American Academy of Arts and Sciences*, Vol. 23, No. 1 (May, 1887 - May, 1888), pp. 37-110.
31. Kolisnichenko, S. V. "Meteorites of Russia". Chelyabinsk: Sanarka. 2019. – 304 pp.
32. Kolomenskiy, V. D., Guskova, E. G. "Catalog of meteorites from the collection of the Leningrad Mining Museum on January 1, 1979". // Meteoritica, issue 40. Committee on Meteorites of the USSR Academy of Sciences, 1982. p. 140.
33. Kuznetsova, V. G. "Meteorites of the collection of the Leningrad Mining Museum at the Leningrad Mining Institute. // Meteoritica, issue 12. Committee on Meteorites of the USSR Academy of Sciences, 1955. pp. 83-93.
34. «Le Second Secretaire Mr. le Dr. Auerbach...», S. 1076 // Bulletin de la Societe Imperial des Naturalistes de Moscou. Tome XXVII. Moscou Imprimerie de l'Universite Imperiale. 1854.
35. Martel, L. M. V. «Better know a meteorite collection: Natural History Museum in Vienna, Austria» // Planetary Science Research Discovery, 11.05.2009.

36. Matvienko, E. N., Shcherbakov L. A. "History and general information about the collection of I. B. Auerbach". // Mineralogical Almanac. Volume 23, issue 2. 2018.
37. Medvedev, V. N. "Glitch Konstantin Theodor. Biographical information". Unpublished.
38. Merrill, G. P. Handbook and Descriptive Catalogue of the Meteorite Collections in the United States National Museum. Washington: Government Printing Office, 1916.
39. Meteorites at the Field Museum. Brief history. Meteorites Catalog. Chicago. P. 169.
40. Meteorites for sale. Ward's Natural Science Establishment. Rochester, 1899. P. 4. <https://wardproject.org/viewer/16131>
41. Meteorites for Sale. Ward's Natural Science Establishment. Rochester, 1901. P. 5. <https://wardproject.org/viewer/16132>
42. Meteorites for Sale. Ward's Natural Science Establishment. Rochester, 1907. P. 6. <https://wardproject.org/viewer/16305>
43. «Meteorites in the Indian Museum». 31.08.1940. // «Springer Nature». <https://www.nature.com/articles/146299b0>
44. Meteoritical Bulletin Database. // The Meteoritical Society. International Society for Meteoritics and Planetary Science. [Meteoritical Bulletin: Search the Database \(usra.edu\)](https://www.meteoriticalbulletin.org/)
45. Mitta, V. V., Starodubtseva, I. A. "Herman Trautshold and his contribution to the study of the Central Russian Jurassic". // «VM-Novitates. News from the V.I. Vernadsky Geological Museum" No. 10, 12/24/2002.
46. Nininger, H. H., Nininger A. D. «The Nininger collection of meteorites. A Catalog and a History». Winslow, Arizona, a Publication of the American Meteorite Museum, 1950.
47. Orviku, K. K. "Meteorites of the collection of the Geological Institute of the Academy of Sciences of the Estonian SSR (Tartu)" // "Meteoritika", issue 12. Committee on Meteorites of the USSR Academy of Sciences, 1955. pp. 94-102.
48. Paneth, F. A. The frequency of meteorite falls throughout the age. // Vistas in Astronomy, vol. 2, 1956, pp. 1681-1686.
49. Price list of meteorites. James R. Gregory @ Co., Mineralogist. P. 3. <https://wardproject.org/viewer/16317>
50. Price list of meteorites (1914), Ward's Natural Science Establishment. Rochester, 1914. P. 10. <https://wardproject.org/viewer/16308>
51. Prior, G. T. Catalogue of meteorites with special reference to those represented in the collection of the British Museum (Natural History). London: British Museum Order, 1923.
52. Reeds, C. A. Catalogue of meteorites in American Museum of Natural History. 1937. (As of 1. October 1935). P. 620. // Bulletin of the American Museum of Natural History. Vol. LXXIII, Art. VI, pp. 517-692. New-York. Issued July 26, 1937.
53. Salvatori, R., Maras, A., King, E. A. Inventory of the Vatican meteorite collection. Meteoritics. 1984.
54. Sen Gupta, P.R. Catalogue of the meteorite collection of the Geological Survey of India in the Indian Museum. Calcutta: Geological Survey of India, 1982.
55. Shepard, C. U. «New classification of meteorites». P. 27. // American Journal of Science and Arts. 2. Series. Vol. XVIII. No. 127, 128, 129. New Heaven Editors, 1867.
56. The Sheppard collection of meteorites. Deposited in the National Museum by prof. Charles Upham Sheppard, jr. P. 261. // Annual report of the board of regents of the Smithsonian institution, showing the operations, expenditures, and condition of the institution for year ending June 30, 1886. Part II. Washington, government printing office. 1889.
57. Sperk, F. R. "Experiments of the chronological index of literature of the Astrakhan region from 1473 to 1887 inclusive". Publication of the Astrakhan Provincial Statistical Committee.
58. Störig, H. J. "Knaurs moderne Astronomie: das Standartwerk völlig neu bearbeitet". München: Droemer Knaur, 1992.
59. Story-Maskelyne, Nevil. Catalogue of the collection of meteorites exhibited in the Mineral Department of the British Museum. London: Pamphlet. 1877.
60. Thalheim, K. Katalog der Meteoriten am Staatlichen Museum für Mineralogie und Geologie zu Dresden. – Schriften des Staatlichen Museums für Mineralogie und Geologie zu Dresden, 1997.
61. Vernadsky, V. I. Selected Works, vol. 5. Moscow: Publishing House of the USSR Academy of Sciences, 1960.
62. Vernadsky, V. I. "Several considerations on the problems of meteoritics", report. // Archive of the Russian Academy of Sciences. F.518. Op.1. D.145. Read it 27.02.1938.
63. Wadsworth, M. E. «Lithological studies. A description and classification of the rocks of the Cordilleras». Cambridge, October 1884.

64. Ward-Coonley Collection of meteorites. Chicago, 1901. <https://wardproject.org/viewer/16313>
65. Wülfing, E. A. Die Meteoriten in Sammlungen und ihre Literatur. Tübingen: Verlag der H. Laupp'schen Buchhandlung, 1897.
66. Yavnel, A. A., Ivanova, A. V., Zaslavskaya, N. I. Catalog of meteorite collections of the Soviet Union. Moscow: Institute of Geochemistry and Analyte. Chemistry, 1986. – 221 p.
67. Zavaritsky, A. N., Kvasha, L. G. "Meteorites of the USSR. Collection of the USSR Academy of Sciences. M., 1952.
68. <https://www.amherst.edu/museums/naturalhistory/collections/meteorites> Massachusetts University, the fate of the Shepard Collection.
69. <https://www.amnh.org/research/physical-sciences/earth-and-planetary-sciences/geology-collections/history-lists-meteorites-tektites-impactites> The website of the American Museum of Natural History.
70. <https://collections.peabody.yale.edu/search/Search/Results?lookfor=meteorite+ruusia&type=AllFields&page=4> Meteorite Collection (from Russia) of Yale University.
71. <http://historicismeteorites.com/Albumen.html> The album of photographs of the collection J. Gregory (1890s).
72. <https://geoloogia.info/specimen/357501/tug-1185-163/rock-identifications> The website of the Tartu University, online catalog.
73. <https://www.emuseum.uni-tuebingen.de/> The electronic catalog of the Mineralogical Museum of the Tübingen University.
74. <https://www.lpi.usra.edu/meteor/> Website of the International Meteorite Society.
75. <https://www.meteorite.com/niningers-old-meteorite-museum/> The fate of the old Ninninger's Museum.
76. <https://meteorites.asu.edu/collection/specimen-catalogue> The Carlton Moore Catalog, Arizona State University.
77. <https://www.meteorites.ru> Meteoritics Laboratory of the Vernadsky Institute of Geochemistry and Analytical Chemistry. The meteorite collection of the Russian Academy of Sciences.
78. <http://www.meteoritica.ru/catalog/107/> Dmitry Kazakov's project: Meteorites of Russia.
79. <http://minecat.rc.fas.harvard.edu/objects/> The meteorite collection of the Mineralogical and Geological Museum of Harvard University.
80. <https://www.mnhn.fr/en/meteorite-collection> Meteorite collection of the France National Museum of Natural History in Paris.
81. <https://musee-mineralogie.unistra.fr/rubrique2.html?lang=fr> The website of the Mineralogical Museum of the Strasbourg University.
82. <https://naturarv.nrm.se/faces/pages/results.xhtml> The website of the National Museum of Natural History in Stockholm.
83. <https://naturalhistory.si.edu/research/mineral-sciences/collections-overview> Overview of the mineral collections of the Smithsonian National Museum of Natural History.
84. <https://www.planets.org/the-collection> The website of the Planetary Research Foundation.
85. https://ru.wikipedia.org/wiki/Шайфус,_Людвиг_Вильгельм
86. <https://rus-brokgauz-efron.slovaronline.com/30445-Гайдингер>
87. <https://science.mnhn.fr/all/list?meteorClass=IAB-MG> The collection of iron meteorites of the France National Museum of Natural History.
88. <https://www.senckenberg.de/de/institute/senckenberg-naturhistorische-sammlungen-dresden/museum-fuer-mineralogie-und-geologie/dd-sektion-mineralogie/mineralogie-team-2/> Description of the collection in Mineralogy and Geology Museum Dresden.
89. <https://www.uni-wuerzburg.de/einrichtungen/museen/mineralogisches-museum/ausstellungen/sonderausstellungen/meteorite/> The website of the Mineralogical Museum of the Würzburg University.
90. <https://utrechtmeteoritelab.sites.uu.nl>. Meteorite Laboratory of the Utrecht University.

Contents

Introduction	3
Sources: reference books, articles	7
Russian collections	17
European collections	31
American and other collections.....	45
The prospects.....	59
Literature, sources	60

Alexander Smirnov

Meteorite "Sarepta". The story on Earth

Published in the author's edition

Signed to the press on 01.12.2023

The format is 200x145.

Printed in the "New Colors", Volgograd, Russia